

Appendix A

Boring Logs



AECOM
 8005 Outer Circle Road
 Brooks City-Base, TX 78235
 Telephone: (210) 887-4227

BORING NUMBER ST014-MC582

PAGE 1 OF 1

CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 10/2/09 COMPLETED 10/2/09 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almousli NOTES Birchwood Hanger

DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
5	4-5			SILTY SAND (0-10'): Inorganic silts and very fine sand, rock flour, silty or clayey fine sands with slight plasticity.
	5-7			
10	9-10			
15	12-14			SAND (1-20'): Poorly graded sand, little or no fines, some gravel.
	14-15			
20	17-19			
	19-20			
25	24-25			GRAVELLY SAND (20-40'): Poorly graded gravelly sand, little or no fines.
	25-27			
30	29-30			
	30-32			
35	34			
	37			
40	40			

Bottom of borehole at 40.0 feet.

AECOM SOIL BORINGS - GINT STD US.GDT - 6/2/10 15:17 - C:\PROGRAM FILES\GINT\PROJECTS\GALENAMC.GPJ



AECOM
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BORING NUMBER ST014-MC592

CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 10/4/09 COMPLETED 10/4/09 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almousli NOTES Birchwood Hanger

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DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
	2-4	121		CLAYEY GRAVEL (0-7'): Poorly graded gravel-sand-clay mixture.
5	4-5	157		
	5-7	85		
	7-9	30		
10	9-10	0		SILTY GRAVEL (9-10'): Poorly graded gravel-silt-sand mixture.
	10-12	92		ORGANIC SILT (10-12'): Silty-clay with low plasticity.
	12-14	0		SILTY SAND (12-19'): Poorly graded sand-silt mixture.
15	15-17	95		
	17-19	120		
20				
	22-24	0		SAND (22-29'): Well-graded gravelly sands, little or no fines.
25	24-25	115		
	27-29	165		
30	29-30	287		
	30-32	0		
	32-34	262		
35	34-35	0		
	35-37	0		
	37-39	0		
40	39-40	69		

Bottom of borehole at 40.0 feet.



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BORING NUMBER SS016-MC570

CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 9/28/09 COMPLETED 9/28/09 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almousli NOTES Former POL Fuel Lab

DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		0		SILT (0-2'): Very dark gray (3/1 10 YR); Silt with trace fine sand, some non-uniform gravel; soft, dry.
		0		SILTY CLAY (2-4'): Very dark gray (4/1 10YR); 70% Clay, 30% Silt; soft, dry.
5		0.8		SANDY CLAY (4-5'): Dark gray (4/1 10YR); 70% Clay, 20% fine Sand; soft, dry.
				SILTY CLAY (5-10'): Very dark gray (3/1 10 YR); 80% Clay, 20% Silt; soft, dry.
	7-9	270.5		CLAY (7-10'): Very dark gray (3/1 10 YR); Clay with trace silt; soft, dry.
10	9-10	1135		SILTY CLAY (5-10'): Very dark gray (3/1 10 YR); 80% Clay, 20% Silt; soft, dry.
	12-14			SILT (12-17'): Very dark gray (3/1 10 YR); silt; soft, dry.
15	14-15	1170		
	15-17	1.99		
	17-19	201		CLAYEY SILT (17-19'): Very dark gray (3/1 10 YR); 70% Silt, 30% Clay; soft, dry.
20	19-20	59		SAND (19-40'): Very dark gray (3/1 10 YR); fine Sand with trace non-uniform gravel; soft, dry.
	22-24	459		
	24-25	459		
25	25-27	570		
		780		
	29-30	1190		
30	30-32	889		
	32-34	1190		
		594		
35	35-37	20.3		
40	39-40	14.3		

Bottom of borehole at 40.0 feet.

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 Telephone: (210) 887-4227

BORING NUMBER SS016-MC571

CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 9/29/09 COMPLETED 9/29/09 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almousli NOTES Former POL Fuel Lab

DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		1.7		SILT (0-2'): Very dark grayish brown (3/2 10 YR); Silt with some non-uniform large gravel; loose, dry.
		427		SILTY SAND (2-5'): Dark brown (4/3 10 YR); 70% fine Sand, 30% Silt; loose, dry; some non-uniform gravel.
5	4-5	427		
	5-7	635		CLAY (5-9'): Very dark gray (3/1 10 YR); medium plasticity; dry.
		963		
10	9-10	1085		CLAYEY SILT (9-10'): Very dark gray (3/1 10 YR); 70% Silt, 30% Clay; soft, dry.
	10-12	793		
	12-14	675		
15	14-15	793		
	15-17	675		
20	19-20	141		CLAYEY SILT (19-22'): Dark gray (4/1 10 YR) with dark yellowish-brown mottling (4/4 10YR); 60% Silt, 40% Clay; soft, dry.
	20-22	32.4		
		11.5		SAND (22-30'): Dark gray (4/1 10 YR); medium grained sand with trace non-uniform gravel; loose, moist to wet.
25	25-26	34.7		
30	29-30			

Bottom of borehole at 30.0 feet.

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BORING NUMBER SS016-MC572

CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 9/29/09 COMPLETED 9/29/09 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almouslli NOTES Former POL Fuel Lab

DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		1		GRAVELLY SILT (0-2'): Dark yellowish brown (4/4 10 YR); silt and large non-uniform gravel; very loose.
		3.4		SILTY SAND (2-4'): Dark yellowish brown (4/4 10 YR); 70% fine Sand, 30% Silt; loose, dry; some large non-uniform gravel.
5	4-5			SILTY CLAY (4-10'): Very dark grayish brown (3/2 10 YR); 70% low-plasticity Clay, 30% Silt; soft.
	5-7	161		
	7-9	42.6		
10	9-10	16.4		SILTY SAND (10-12'): Very dark grayish brown (3/2 10 YR); 60% fine Sand, 20% Silt, 20% Clay; loose, dry.
		1.4		
		1.3		SANDY CLAY (12-15'): Very dark grayish brown (3/2 10 YR); 70% Clay, 20% fine Sand, 10% Silt; soft, dry.
15	14-15	1.8		
	15-17	2		CLAYEY SILT (15-17'): Very dark grayish brown (3/2 10 YR); 60% Silt, 30% Clay, 10% fine Sand; loose, dry.
		1.4		SILTY CLAY (17-20'): Very dark grayish brown (3/2 10 YR); 70% Clay, 30% Silt; soft, dry.
20	19-20	0.9		
Bottom of borehole at 20.0 feet.				

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BORING NUMBER SS016-MC573

CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 9/30/09 COMPLETED 9/30/09 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almousli NOTES Former POL Fuel Lab

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DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		686		SILT (0-5'): Very dark gray (3/1 7.5 YR); Silt with trace non-uniform gravel; loose, dry.
5	4-5	686		
	5-7			SILTY CLAY (5-9'): Black (2.5/1 7.5 YR); 70% lean Clay, 30% Silt; dry.
	7-9	997.7 968		
10	9-10			- Moist at 9', increase in clay content.
	12-14	1157 1167 1265		CLAYEY SILT (12-20'): Dark Gray (4/1 7.5 YR), 80% Silt, 20% Clay; dry.
15	14-15			
	15-17			
	17.5-20	1275		
20	20-22	1057		SAND (20-29'): Dark gray (4/1 7.5 YR); poorly graded, medium grained sand, trace clay.
	25	36		
25	25	52		
	25-27	28		
	27-29			
30	29-30			-Trace non-uniform gravel.

Bottom of borehole at 30.0 feet.



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BORING NUMBER SS016-MC574

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CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 9/30/09 COMPLETED 9/30/09 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almousli NOTES Former POL Fuel Lab

DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				SILT (0-5'): Dark grayish brown (4/2 10YR); loose, dry; trace non-uniform gravel
5	4-5			SILTY CLAY (5-7'): Very dark gray (3/1 10YR); 60% Clay, 40% Silt; soft, dry with increasing moisture with depth.
10	9-10			SANDY CLAY and SILT (9-10'): Very dark gray (3/1 10YR); 60% lean Clay, 20% fine sand, 20% Silt; soft, moist.
	12-14			SILTY SAND (10-27'): Dark grayish brown (4/2 10YR); 70% fine Sand, 30% Silt; loose, moist to dry.
15	14-15			
20	20			-Moist at 17', Trace clay at 17-19'
25	24-27			
	27-30			GRAVELLY SAND (27-30'): Dark grayish brown (4/2 10YR); 70% medium-grained sand, 30% non-uniform gravel; loose.
30				Bottom of borehole at 30.0 feet.

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AECOM
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BORING NUMBER SS017-MC566

CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 9/26/09 COMPLETED 9/26/09 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almousli NOTES Truck Fillstands

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DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				SILT (0-2'): Dark gray (5/1 7.5 YR); 90% Silt, 10% Small Gravel; Dry.
	2-4'			SILTY CLAY (2-10'): Dark gray (5/1 7.5 YR); 70% Clay, 30% Silt; Soft, low-plasticity, dry; -Trace large gravel at 2-4'.
5	4-5'			
	5-7'			
	7-9'			
10	9-10'			SANDY CLAY with SILT (10-15'): Very Dark gray (3/1 7.5 YR); 50% Clay, 30% Sand, 20% Silt; Soft, low-plasticity, dry.
	10-12'			
15	14-15'			SILTY SAND (15-30'): Very dark gray (3/1 7.5 YR); 70% Fine Sand, 30% Silt; Soft, slightly moist.
	17-19'			
20	19-20'			
	20-22'			
	24-25'			
	25-27.5'			
	27.5-30'			20-30'- Trace poorly-sorted gravel.
30				SILTY SAND with CLAY (30-40'): Very dark gray (3/1 7.5 YR); 50% Fine Sand, 30% Silt, 20% Clay; Soft, low-plasticity, moist. -Trace poorly-sorted gravel.
	32-34'			
35	34-35'			
	35-37'			
40	39-40'			

Bottom of borehole at 40.0 feet.



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BORING NUMBER SS017-MC567

PAGE 1 OF 1

CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 9/27/09 COMPLETED 9/27/09 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almousli NOTES Truck Fillstands

DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
4		4		SILT with GRAVEL (0-4'): Very dark brown (2.5/2 7.5 YR); Silt with trace non-uniform large gravel; soft, dry.
5		1		CLAYEY SILT (4-10'): Very dark brown (2.5/2 7.5 YR); 8-0% Silt, 20% Clay; soft, dry.
		5		
10	9-10	1		SILTY SAND (10-20'): Very dark brown (2.5/2 7.5 YR); 70% fine Sand, 30% Silt; soft dry.
	12-14	2		
15	14-15	1		
		10		
	17-19	2		
20	19-20	1		
	22-24	4		
		2		
25	24-25	1		
			-Trace non-uniform small gravel at 20-24'	
	27-29	2		
30	29-30	1		
	30-32	2		
	32-34	1008		
35	34-35	345		
	35-37	13.7		
	37-39	3.1		
40	40	3.2		

Bottom of borehole at 40.0 feet.

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BORING NUMBER SS017- MC568

CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 9/27/09 COMPLETED 9/27/09 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almousli NOTES Truck Fillstands

AECOM SOIL BORINGS - GINT STD US.GDT - 6/2/10 15:17 - C:\PROGRAM FILES\GINT\PROJECTS\GALENAMC.GPJ

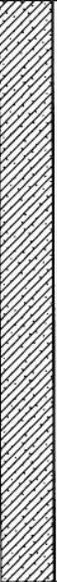
DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		311		SILTY SAND (0-3'): Very dark gray (7.5YR 3/1); 60% medium Sand, 40% Silt; soft, dry; some non-uniform gravel.
	3-4			
5	4-5	67 67		CLAYEY SILT (3-9'): Very dark gray (7.5YR 3/1); 70% Silt, 30% Clay; soft, dry. -Moisture and clay content increase with depth.
		449		
10	9-10	24.5		SILTY CLAY (9-10'): Very dark gray (7.5YR 3/1); 60% Clay, 20% Silt, 20% fine sand; soft, dry to moist.
				SAND (10-22'): Brown (7.5YR 4/2); fine sand; soft, dry.
	12-14	1		
15		22.5		
				-Trace non-uniform gravel at 19-22'
		5.6		
		5.9		GRAVELLY SAND (22-25'): Brown (7.5YR 4/2); 70% fine Sand, 30% non-uniform gravel; soft, dry to moist.
25	24-25	5.9		
				SILTY SAND (25-27.5'): Brown (7.5 YR 4/2); 70% fine Sand; 30% Silt; soft, dry to moist.
				GRAVELLY SAND (27.5-30'): Brown (7.5YR 4/2); 70% fine Sand, 30% non-uniform gravel; soft, dry to moist.
30	0	0		
Bottom of borehole at 30.0 feet.				



AECOM
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 Telephone: (210) 887-4227

BORING NUMBER SS017-MC569

CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 9/29/09 COMPLETED 9/29/09 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almousli NOTES Truck Fillstands

DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
5				
	7-9	3.6		SANDY CLAY (0-19'): Inorganic clays of low to medium plasticity, sandy, some silt and gravel.
10	9-10	3.6		
	12-14	31.1		
15	14-15	36.2		
20	20			
	20-22			GRAVELLY SAND (19-40'): Poorly graded sand and gravel, little to no fines.
25	24-25			
	27-29			
30	29-30			
	30-32			
35	34-35			
	35-37			
40	39-40			

Bottom of borehole at 40.0 feet.

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BORING NUMBER SS017-MC581

PAGE 1 OF 1

CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 2/10/09 COMPLETED 10/2/09 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almouslli NOTES Truck Fillstands

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DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
5	4-5			GRAVELLY SAND (0-5'): Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity, some gravel.
	5-7			SANDY CLAY (5-10'): Inorganic clays, low to medium plasticity; sandy, lean clay with trace gravel.
10	9-10			SILTY CLAY (10-17'): Inorganic silt with low plasticity clay, very fine sand.
	10-12			
	12-14			
15	14-15			
	15-17			
	17-19			SANDY GRAVEL (17-32'): Poorly graded gravel and sand, little or no fines.
20	20-22			
	22-24			
25	25-27			
	27-29			
30	29-30			
	30-32			
	32-34			
35	34-35			GRAVELLY SAND (34-40'): Poorly graded sand and gravel, some silt.
	35-37			
	37-39			
40	39-40			
Bottom of borehole at 40.0 feet.				



AECOM
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BORING NUMBER ST021-MC563

CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 7/25/09 COMPLETED 7/25/09 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almoulli NOTES Bldg. 1549 Old Fire Station

AECOM SOIL BORINGS - GINT STD US.GDT - 6/2/10 15:17 - C:\PROGRAM FILES\GINT\PROJECTS\GALENAMC.GPJ

DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		152.5		CLAYEY SILT (1-4'): Dark gray (4/3 7.5 YR); 70% Silt, 30% Clay; soft, dry; trace non-uniform gravel.
	2-4	152.5		
5	4-5	60.1		SILTY CLAY (4-7'): Very dark grayish brown (3/2 10 YR); 80% Clay, 20% Silt; soft, dry; trace non-uniform.
		60.1		
		16.1		SILTY CLAY (7-9'): Dark gray (4/1 7.5 YR); 70% Clay, 30% Silt, soft, dry; some brown mottling (5/8 7/5 YR).
10	9-10	5.1		SILTY CLAY (9-10'): Dark gray (4/1 7.5 YR); 50% Clay, 50% Silt; soft, dry.
		372		SANDY CLAY (10-12'): Dark gray (4/1 7.5 YR); 60% Clay, 20% fine Sand, 20% Silt; soft, dry.
		1216		SAND (12-24'): Dark gray (4/1 7.5 YR); 80% fine Sand, 10% Silt, 10% Clay; soft, dry.
15				-Trace non-uniform rounded gravel
20	19-20			-Moist at 24'
		688		
	22-24	688		
25	25	864		
		1220		
		875		
30	30	1220		
	30-32.5			
		1041		
	32.5-35	849		

Bottom of borehole at 35.0 feet.



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BORING NUMBER ST021-MC564

CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 9/25/09 COMPLETED 9/25/09 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almousli NOTES Bldg. 1549 Old Fire Station

AECOM SOIL BORINGS - GINT STD US.GDT - 6/2/10 15:17 - C:\PROGRAM FILES\GINT\PROJECTS\GALENAMC.GPJ

DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		6.1		SILT (0-2'): 4/2 10 YR; 80% Silt, 10% fine Sand, 10% small Gravel; soft, dry.
		4.4		CLAYEY SILT (2-4'): 4/2 10 YR; 70% Silt, 30% Clay, small Gravel, dry.
5		2.1		-3/6 10 YR Mottling (4-5')
		0.6		SAND (5-7'): 4/2, 3/6 YR; 60% fine Sand, 20% Silt, 20% Clay; soft, dry.
		0.7		SILTY CLAY (7-10'): 3/2 10 YR; 80% Clay, 20% Silt; soft, dry.
10	9-10			SAND (10-29'): 4/2, 3/6 10 YR; 60% fine Sand, 20% Silt, 20% Clay; soft, moist.
15	14-15	0		
20	19-20	0		
25		2.2		
30		56		
		823		SAND with GRAVEL (29-32.5'): Soft black; 70% medium Sand, 20% large Gravel, 10% Silt; soft, moist.
	30-32.5	829		SAND (32.5-35'): 4/2, 3/6 10YR; 60% fine Sand, 20% Silt, 20% Clay; soft, moist; trace small gravel.
35		6.7		
	35-37			SANDY SILT (35-40'): 4/2 10YR; 50% Silt, 50% fine Sand; soft, moist.
	37-39	3.4		
40	39-40	2.8		
Bottom of borehole at 40.0 feet.				



AECOM
 8005 Outer Circle Road
 Brooks City-Base, TX 78235
 Telephone: (210) 887-4227

BORING NUMBER ST021-MC565

PAGE 1 OF 1

CLIENT AFCEE PROJECT NAME Galena Airport
 PROJECT NUMBER 60134661 PROJECT LOCATION Galena, Alaska
 DATE STARTED 9/9/09 COMPLETED 9/9/29 HOLE SIZE 2-inch
 DRILLING CONTRACTOR North American Probing Services DRILLING METHOD Direct Push
 LOGGED BY C. Smith CHECKED BY O. Almousli NOTES Bldg. 1549 Old Fire Station

DEPTH (ft)	SAMPLE INTERVAL	PID READING (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
0.5				SILT (0-4'): Very dark grayish brown (10YR 3/2) silt, soft, dry, some non-uniform small gravel.
5				
10				
10-12		37		SILTY CLAY (9-10'): Very dark grayish brown (10YR 3/2); 70% Clay, 30% Silt; soft, dry.
12-14		1022		CLAYEY SAND (10-14'): Very dark grayish brown (10YR 3/2); 60% fine Sand, 40% Clay; trace silt.
15				
15-17		1627		CLAYEY SAND (14-17''): Very dark grayish brown (10YR 3/2); 80% fine Sand, 20% Clay; trace silt.
17-19				-Trace non-uniform gravel at 17-27'
20				
25				
25-27				
27-29				-Trace large gravel 27-40'
30				
30-32.50				
35				
40				

Bottom of borehole at 40.0 feet.

AECOM SOIL BORINGS - GINT STD US.GDT - 6/2/10 15:17 - C:\PROGRAM FILES\GINT\PROJECTS\GALENAMC.GPJ

SOIL BORING LOG

PROJECT NAME: Former Galena Forward Operating Location, Task Order 184		HOLE DEPTH (ft): 20.00	DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska	
SURFACE ELEVATION: 141.08 feet	NORTHING (UTM ZONE 4N): 7181007.92	EASTING (UTM ZONE 4N): 597509.82	DATE STARTED: 8/13/2010	DATE COMPLETED: 8/13/2010
WATER LEVEL: 16 feet bgs	DRILLING METHOD: Direct Push		DRILLING EQUIPMENT: Geoprobe 6620 DT	
LOCATION: AST1569/RAPCON			LOGGED BY: N. Kinnebrew	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	SAMPLE #	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION			SOIL DESCRIPTION	OVM (ppm):		COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
					%G	%S	%F		PID CORE	HEAD SPACE	
1			DP-1		70	25	5	GRAVEL (GW) , tan, dry, dense, rounded to subangular gravel, medium grained, medium grained subangular sand.	0	1	
2											
3								SILT (ML) , dark gray, moist, very stiff.			11:35 Soil sample AST1569GP001_0-2 and TA split collected at 0 to 2 feet bgs.
4								SILT (ML) , dark gray, moist, very stiff, cross-bedding with gravel and woodchips.	73.4	293	
5								Same as above with limonite staining at 12.5 feet bgs.			11:45 Soil sample AST1569GP001_3-5 collected at 3 to 5 feet bgs. POL odor.
6		90	DP-2								
7									8.8	216	
8											11:55 Soil sample AST1569GP001_5-7 collected at 5 to 7 feet bgs.
9											
10											
11		90	DP-3						1	43.2	
12									1	5.2	
13											12:15 Soil sample AST1569GP001_10-12 collected at 10 to 12 feet bgs.
14					0	90	10	SAND (SW) , tan to grayish tan, moist, dense, medium grained, subangular, well graded, cross-bedding with gray silt.			
15								Same as above with no silt cross-bedding.			
16		95	DP-4						0.9	0.9	
17									0	0.6	Water table at 15.5 feet bgs.
18											12:45 Soil sample AST1569GP001_15-17 collected at 15 to 17 feet bgs.
19											
20											

Boring Terminated at 20 feet bgs

SOIL BORING LOG

PROJECT NAME: Former Galena Forward Operating Location, Task Order 184		HOLE DEPTH (ft): 10.00	DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska	
SURFACE ELEVATION: 141.08 feet	NORTHING (UTM ZONE 4N): 7181004.36	EASTING (UTM ZONE 4N): 597508.98	DATE STARTED: 8/13/2010	DATE COMPLETED: 8/13/2010
WATER LEVEL: --- feet bgs	DRILLING METHOD: Direct Push		DRILLING EQUIPMENT: Geoprobe 6620 DT	
LOCATION: AST1569/RAPCON			LOGGED BY: N. Kinnebrew	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	SAMPLE #	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION			SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm):		COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
					%G	%S	%F		PID CORE	HEAD SPACE	
1		70	DP-1		70	25	5	GRAVEL (GW) , tan, dry, dense, rounded to subangular gravel, medium grained, medium to fine grained sand.	0	1	
2											
3								SILT (ML) , dark gray, moist, very stiff.	0	17.7	14:40 Soil sample AST1569GP902_0-2 and at 0 to 2 feet bgs.
4											
5		90						Same as above, cross-bedding with fine grained sand.	3.9		14:45 Soil sample AST1569GP002_3-5 collected at 3 to 5 feet bgs.
6			DP-2								
7											
8									0.9	0.2	15:05 Soil sample AST1569GP002_5-7 collected at 5 to 7 feet bgs.
9											
10											
Boring Terminated at 10 feet bgs											

SOIL BORING LOG

PROJECT NAME: Former Galena Forward Operating Location, Task Order 184		HOLE DEPTH (ft): 10.00	DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska	
SURFACE ELEVATION: 139.44 feet	NORTHING (UTM ZONE 4N): 7180934.88	EASTING (UTM ZONE 4N): 597459.61	DATE STARTED: 9/1/2010	DATE COMPLETED: 9/1/2010
WATER LEVEL: --- feet bgs	DRILLING METHOD: Direct Push		DRILLING EQUIPMENT: Geoprobe 6620 DT	
LOCATION: JP4 Fill Stands, East			LOGGED BY: M. Godwin	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	SAMPLE #	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION			SOIL DESCRIPTION	OVM (ppm):		COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
					%G	%S	%F		PID CORE	HEAD SPACE	
1		100	DP-1		50	35	15	SANDY GRAVEL WITH SILT (GW) , dark olive gray (5Y 3/2), moist, very dense, angular to rounded gravel up to 2 inches, medium grained angular quartz sand, silty gravel at base, silt plastic.			14:55 Soil sample B1558GP001_0-2 collected at 0 to 2 feet bgs.
2					0	0	100		SILT (ML) , dark brown (7.5YR 3/2), to very dark gray (5Y 3/1), moist, stiff, laminated, heavy limonite staining 3-4.5 feet bgs, gray silt slight POL odor, low plasticity, slow dilatancy, micaceous.		
3								SANDY SILT (SW) , dark olive gray (5Y 3/2), wet, stiff, abundant roots, peat on partings, micaceous, plastic, rapid dilatancy.			POL odors from 6 to 10 feet bgs.
4					0	0	100				
5					0	60	40		SILTY SAND (SM) , dark grayish brown (2.5Y 4/2), moist, stiff, cross bedding, fine grained angular quartz sand with silt, nonplastic.		
6		100	DP-2		0	50	50	SILTY SAND (SM) , dark gray (5Y 4/1), moist, frozen, hard, laminated, strong POL odors, very fine grained angular quartz sand.			15:20 Soil sample B1558GP001_9-10 collected at 9 to 10 feet bgs, AK 101/102/103.
7											
8											
9											
10											

Boring Terminated at 10 feet bgs

SOIL BORING LOG

PROJECT NAME: Former Galena Forward Operating Location, Task Order 184		HOLE DEPTH (ft): 10.00	DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska	
SURFACE ELEVATION: 139.44 feet	NORTHING (UTM ZONE 4N): 7180931.75	EASTING (UTM ZONE 4N): 597455.62	DATE STARTED: 9/1/2010	DATE COMPLETED: 9/1/2010
WATER LEVEL: --- feet bgs	DRILLING METHOD: Direct Push		DRILLING EQUIPMENT: Geoprobe 6620 DT	
LOCATION: JP4 Fill Stands, East			LOGGED BY: M. Godwin	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	SAMPLE #	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION			SOIL DESCRIPTION	OVM (ppm):		COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
					%G	%S	%F		PID CORE	HEAD SPACE	
1		100	DP-1		50	35	15	SANDY GRAVEL WITH SILT (GW) , dark olive gray (5Y 3/2), moist, very dense, angular to rounded gravel up to 2 inches, medium grained angular to rounded quartz+ lithic sand, silt is non plastic.			15:35 Soil sample B1558GP002_0-2 collected at 0 to 2 feet bgs.
2											
3					40	40	20	SILTY GRAVEL (GM) , dark grayish brown (10 YR 3/2), moist, very dense, massive, wood at 4 feet bgs, silt has low plasticity, moderate dilatancy, rounded gravel to 2 inches, medium grained quartz sand, strong POL odors at base.			15:40 Soil sample B1558GP002_3-5 collected at 3 to 5 feet bgs.
4											
5		100	DP-2		0	0	100	SILT (ML) , very dark gray (5Y 3/1), moist, stiff, laminated, low plasticity, with roots.			Strong POL odors 7 to 8.5 feet bgs.
6											
7					0	0	100	SILT (ML) , very dark gray (2.5Y 3/1), wet, stiff, with strong POL odors, sheen on silt surface partings in laminations, low plasticity, micaceous, rapid dilatancy.			16:00 Soil sample B1558GP002_7-85 collected at 3 to 5 feet bgs, AK101/102/103.
8											
9					0	60	40	SILTY SAND (SM) , dark gray (5Y 4/1), slightly moist, cross bedding, lamination, mild POL odors, very fine grained angular quartz sand with silt.			
10											
Boring Terminated at 10 feet bgs											

SOIL BORING LOG

PROJECT NAME: Former Galena Forward Operating Location, Task Order 184		HOLE DEPTH (ft): 10.00	DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska	
SURFACE ELEVATION: 139.44 feet	NORTHING (UTM ZONE 4N): 7180934.83	EASTING (UTM ZONE 4N): 597450.61	DATE STARTED: 9/1/2010	DATE COMPLETED: 9/1/2010
WATER LEVEL: --- feet bgs	DRILLING METHOD: Direct Push		DRILLING EQUIPMENT: Geoprobe 6620 DT	
LOCATION: JP4 Fill Stands, East			LOGGED BY: M. Godwin	

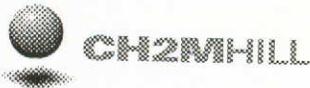
DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	SAMPLE #	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION			SOIL DESCRIPTION	OVM (ppm):		COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
					%G	%S	%F		PID CORE	HEAD SPACE	
1			DP-1		0	0	100	SANDY GRAVEL (GW) , dark brown (7.5 YR 3/2) to very dark grayish brown (2.5 Y 3/2), moist to dry, very dense, angular to rounded gravel to 2 inches, medium grained angular to rounded quartz and lithic sand, mild POL odor at base. CONCRETE (PCC) , 0.75-feet thick. SANDY GRAVEL (GW) , same as 0-1 feet bgs, moist at base, likely backfill to at least 10 feet bgs.			17:10 Soil sample duplicate B1558GP904_9-10 collected at 0 to 2 feet bgs.
2				60	35	5					
3											
4											
5					0	0	100	SILT (ML) , dark grayish brown (2.5 Y 4/2), moist, stiff, laminated to cross bedding, abundant roots, low plasticity, moderate dilatancy.			
6			DP-2								
7											
8					0	50	50	SANDY SILT (SW) , dark gray (2.5Y 4/1) to dark olive brown (2.5 Y 3/2), dry to moist, laminated, cross bedding, medium dense, strong POL odors at top, mild POL odors at base, very fine grained angular quartz sand with silt.			
9											
10											
_____ Boring Terminated at 10 feet bgs											

SOIL BORING LOG

PROJECT NAME: Former Galena Forward Operating Location, Task Order 184		HOLE DEPTH (ft): 10.00	DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska	
SURFACE ELEVATION: 141.08 feet	NORTHING (UTM ZONE 4N): 7180939.97	EASTING (UTM ZONE 4N): 597454.26	DATE STARTED: 9/1/2010	DATE COMPLETED: 9/1/2010
WATER LEVEL: --- feet bgs	DRILLING METHOD: Direct Push		DRILLING EQUIPMENT: Geoprobe 6620 DT	
LOCATION: JP4 Fill Stands, East			LOGGED BY: M. Godwin	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	SAMPLE #	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION			SOIL DESCRIPTION	OVM (ppm):		COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
					%G	%S	%F		PID CORE	HEAD SPACE	
1		100	DP-1		60	35	5	SANDY GRAVEL (GW) , dark grayish brown (2.5 YR 4/2), slightly moist, very dense, amassive angular to rounded gravel to >2 inches, medium grained angular to rounded quartz plus lithic sand. CONCRETE (PCC) , 0.75-feet thick. SANDY GRAVEL (GW) , Same as 0 to 1 feet bgs, moist at base, likely backfill to at least 10 feet bgs.			Move 3 feet North. Refusal at 1.5 feet bgs, concrete > 12 inches thick 2-inches below surface gravel. 17:00 Soil sample B1558GP004 0-2 collected at 0 to 2 feet bgs.
2					0	0	100				
3					60	35	5				
4											
5											
6		100	DP-2								
7											
8											
9											
10											

Boring Terminated at 10 feet bgs



PROJECT NUMBER

394439 - 02, RI

BORING NUMBER

SS0056P001

SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184

LOCATION: WILDERNESS HALL, NE

ELEVATION: TBD

DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska

DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe, 6620 DP : Hollow Stem Auger

WATER LEVELS:

START: 0910/7-12-10

END: 1210/7-12-10

LOGGER: M. GARDWIN

DEPTH BELOW SURFACE (feet)	INTERVAL (feet)		RECOVERY (%)	#/TYPE SS=Split Spoon MC=Macrocore	STANDARD PENETRATION TEST RESULTS 6 - 6 - 6 in (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, % gravel/sand/silt-clay	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TIME, TESTS, AND INSTRUMENTATION. OVM/PID reading (ppm): Bkg Breathing Zone Top of Hole Sample			
	INTERVAL (feet)	RECOVERY (%)					TEST RESULTS	COMMENTS		
								Bkg	Breathing Zone	Top of Hole Sample
5	5-0	75%	1-6P	GW GW	SANDY GRAVEL (GW) grayish brown, dry, loose dense, massive, rnd gravel to 2", med grad grtz sand (75/20/5)	PID BACKGROUND 7.5 (moisture) PID CORE 7.5 HEADSPACE 4.4 ppm SS0056P001-0-2 0930				
10	10-5	100%	2-6P	GW GW	SANDY GRAVEL (GW) dry & dense, same as above, gradual w/ above	BACKGROUND PID 14 ppm CORE 17.3 ppm HEADSPACE 16.1 ppm SS0056P001-05-7 1000				
15	15-10	100%	3-6P	ML ML	SILT (ML) drk grayish brw to olv brw, dry to moist, laminated, drc sand, (0/5/95)	PID FAILED DUE TO MOISTURE MODERATE ODOR 12-15 ft bgs SS0056P001-10-12 1015				
20	20-15	90%	4-6P	INTERVAL NOT SAMPLED ML	SANDY SILT (ML) olv brw, dry, stiff, laminated no odors (0/95/5)	PID FAILED				
25	25-20	65%	5-6P	ML SW	SILT (ML) olv brw dry, stiff laminated, gradual w/ above GRAVELLY SAND (SW) gray, wet, dense, gravel to 3/8", med med - coarse graded grtz sand (20/15/5)	NO ODORS SS0056P001-22-24 1090				
30	30-25	100%	6-6P	INTERVAL NOT SAMPLED	GRAVELLY SAND (SW) gray, wet, dense, gradual w/ above, upward fining (20/15/5)	NO ODORS				
35	35-30	100%	7-6P	SW SW	SAND (SW) gray, wet, dense massive, gradual with above, trace wll rnd gravel to 1" med grad grtz sand (5/90/5)	NO ODORS SS0056P001-30-32 1120 ASL/EMAX/TA				

PROJECT NUMBER 394431-02-RI	BORING NUMBER SS0056P002	SHEET 1 OF 2
SOIL BORING LOG		

PROJECT **GALENA FOL / TO-184** LOCATION **WILDERNESS HALL, WEST**
 ELEVATION **TBD** DRILLING CONTRACTOR **GEOTECH ALASKA, INC, ANCHORAGE AK**
 DRILLING METHOD AND EQUIPMENT **DIRECT PUSH, GEOPROBE 6620DT, TRACIL MTD**
 WATER LEVELS **~25ft** START **1005/7-11-10** FINISH **1430/7-11-10** LOGGER **M. GODEWILL**

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	5-0	1 - GP	70%	GW	SANDY GRAVEL (GW) grayish brw (2-5/4 1/2), dry loose to dense, massive rnd gravel to 1", med grnd ang-rndd grtz > lith sand (65/30/5) gradational w/ below	PID CORE 0.0 PPM PID HEADSPACE 3-3 PPM SS0056P002-0-2 1030
10	10-5	2 - GP	90%	GW	SANDY GRAVEL (GW) same as above, slightly moist (65/30/5)	PID CORE 0.0 PPM PID HEADSPACE 0.0 PPM SS0056P002-5-7 ft 1115 + DUPE
15	15-10	3 - GP	100%	ML	SILT (ML) v dk grayish brw (2.5/3 1/2) slightly moist, stiff, laminated w/ rootlets strong POL odor beginning 11 ft bys clayey silt, low plasticity, low dilatancy (0/5/95)	PID CORE 0 - 265 PPM 265 PPM @ 14.5 ft PID HEADSPACE SS0056P002-10-12 1155
20	20-15	4 - GP	95%	SP <small>INTERVAL NOT SAMPLED</small>	SILT (ML) same as above	PID CORE 274 PPM @ 15-16 ft 41 PPM @ 16-5 PID HEADSPACE 10 PPM @ 17 15-16 2567 PPM 18 7-8 PPM
25	25-20	5 - GP	85%	SW	SAND (SP) gray (5/4 1/2) dry, loose to dense, finly bdd, med grnd subrnd grtz >> lith > fld spr (0/100/0)	PID CORE 0.0 PPM PID HEADSPACE 0.3 PPM SS0056P002-22-24 1230
30	30-25	6 - GP	90%	SW	SAND, GRAVELLY (SW) dk grayish brw (2.5/4 1/2) moist to wet, dense, massive rndd gravel to 3/4", med grnd subang-rndd grtz > lith > fld spr (15/40/5) gradational w/ below	PID CORE 0.0 PPM

PROJECT NUMBER 394439.02.RI	BORING NUMBER SS0056P002	SHEET 2 OF 2
SOIL BORING LOG		

PROJECT **GARNA ROL/TO-184** LOCATION **WILDERNESS HALL, WEST**
 ELEVATION **TD** DRILLING CONTRACTOR **GEOTEK ALASKA, INC / ANCHORAGE AK**
 DRILLING METHOD AND EQUIPMENT **DIRECT PUSH, TRUCK MTD GEOPROBE 6620 DT**
 WATER LEVELS **~25 ft** START **1005/7-11-10** FINISH **1430/7-11-10** LOGGER **M GODWIN**

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
35	35-30	7-GP	65%	X SW	SAND (sw) v drk graysh brw (2.54 3/2) wet, dense, massive. upward coarsening at 2" wood at 32 ft bgs, med grnd sub ang - rndd qtz > lith > fldspr, v trace gravel (0/45/5), no odors	PID CORE 0.0 PPM PID HEADSPACE 12.7 PPM SS0056P002_30-32 1410
35	39-35	8-GP	100%	INTERVAL NOT SAMPLED SW	SAND (sw) v drk graysh brw (2.54 3/2) saturated, dense, massive, trace gravel, gradational with above, no odors	PID CORE 0.0 PPM
40	42-39	9-GP	100%	X	SAND (sw) same as above gradational with above	PID CORE 0.0 PPM PID HEADSPACE 0.0 PPM SS0056P002_40-42 1440
45					TD = 42 ft bgs Hole collapsed @ 18 ft bgs No measurable water in borehole	



CH2MHILL

PROJECT NUMBER

394439-02-RT

BORING NUMBER

SS0056P003

SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184

LOCATION: WILDERNESS HALL EAST

ELEVATION: TBD

DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska

DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 6620 DT : Hollow Stem Auger

WATER LEVELS: BIT = GRABBT START: 1430/9/12/10

END: 1815/7-12-10 LOGGER: MGDW/J

DEPTH BELOW SURFACE (feet)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	COMMENTS
INTERVAL (feet)	RECOVERY (%)	#/TYPE			
		SS = Split Spoon	6 - 6 - 6 in (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, % gravel/sand/silt-clay	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TIME, TESTS, AND INSTRUMENTATION.
		MC = Macrocore			OVM/PID reading (ppm): Bkg Breathing Zone Top of Hole Sample
5-0	15%	1	GP	SANDY GRAVEL (GW) light gray, dry, v dense, massive GW med to w/ med gravel to 2" med gravel grtz sand (65/30/5)	NO ODORS SS0056P003-0-2 NORM, MS, MSD 1510
5-10	100%	2	GP	ML SILT (ML) olive brown, dry, stiff, laminated to thin bdd, sandy silt intr bdd w/ silt (0/15/85)	NO ODORS SS0056P003-5-7 1545
10-15	75%	3	GP	SM SILTY SAND (SM) olive brown, dry, stiff, laminated to thin bdd, laminations w/ pe, limonite (0/50/50)	NO ODORS SS0056P003-10-12 1615 + DUPE
15-20	80%	4	GP	SW SILT (ML) drk grayish brown, moist to dry, mod stiff, laminated to thin bdd, trace sand, gradational with above (0/5/95)	NO ODORS
20-25	80%	5	GP	INTENSIVE NOT SAMPLED ML/SW CLAY (CL) gray, limonite stained, wet, laminated, stiff, low plasticity (0/0/100) SILT/SAND (ML/SW) olive brown, interbedded silt and f sand, dry to slightly moist, laminated to thin bdd, 0/50/50	NO ODORS
25-30	80%	5	GP	SW SAND (SW) gray, wet, massive, gradally with gravel to 3/4", med to coarse grtz > lith > fls pr	NO ODORS SS0056P003-22-24 1700



CH2MHILL

PROJECT NUMBER

394439

OL-RE

BORING NUMBER

SS0056P003

SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184

LOCATION: WILDERNESS HALL, EAST

ELEVATION: TBD

DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska

DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 6620 DT : Hollow Stem Auger

WATER LEVELS: ~21 ft

START: 1430/7-12-10

END: 1815/7-12-10

LOGGER: M. GORDON

DEPTH BELOW SURFACE (feet)

STANDARD PENETRATION TEST RESULTS

SOIL DESCRIPTION

COMMENTS

INTERVAL (feet)

RECOVERY (%)

#/TYPE

SS=Split Spoon

MC=Macrocone

TEST RESULTS

6 - 6 - 6 in (N)

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, % gravel/sand/silt-clay

DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TIME, TESTS, AND INSTRUMENTATION.

OVM/PID reading (ppm):
Bkg Breathing Zone Top of Hole Sample

DEPTH BELOW SURFACE (feet)	INTERVAL (feet)	RECOVERY (%)	#/TYPE	STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
25				SW	gradational w/ below	
30	30-25	100%	6-GP	INTERRIAL NOT SAMPLED SW	SAND (sw) gray, wet to saturated, dense, massive upward coarsening, gradational with above, trace gravel, med grnd grtz, lith > fldsp subang-rnd (5/90/5)	NO ODORS
35	35-30	100%	7-GP	SW	SAND (sw) gray, gradational with above, same as above, no gravel	NO ODORS SS0056P003-30-32 1720
40	38-34	100%	8-GP	SW	SAND (sw) drk grayish brn saturated, massive, dense, slight upward fining, trace med grnd to 3/4" @ base, med grnd rnd grtz, lith > fldsp (10/95/5)	NO ODORS
45	42-38		9-GP		SAND (sw) gray, wet, dense massive, gradational with above, med grnd grtz, lith > fldsp (10/95/5)	NO ODOR SS0056P003-39-42 1750
					TD = 42 ft bgs	NO ODORS SS0056P003-40-42 1750 M.G. 7/12/10

CH2MHILL

PROJECT NUMBER 394439.02.RI	BORING NUMBER SS0056P004	SHEET 1 OF 2
SOIL BORING LOG		

PROJECT **GARENA FOL / TO-184** LOCATION **WILDERNESS HALL**
 ELEVATION **TBD** DRILLING CONTRACTOR **GEOTEK ALASKA, INC, ANCHORAGE AK**
 DRILLING METHOD AND EQUIPMENT **DIRECT PUSH, GEOPROBE TRACK MTD 6620 DT**
 WATER LEVELS **NO WATER @ 25' HOLE COLLAPSED** START **0915/7-10-10** FINISH **1230/7-10-10** LOGGER **M. GUDWIN**

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION	COMMENTS
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	5-0	1 GP	60%	GW	at 20.3 SANDY GRAVEL (GW) olive brown (2.54 4/3) dry, loose, massive, gravel to 3/4" rndd med grnd sub ang + rndd grtz > lith sand (45/50/5) sharp contact w/ below	PID HEADSPACE = 24.7 PPM PID TOBBIT 0-25 PPM @ base CORE PID 0-25 PPM @ base SS0056P004-0-2 0930 PPM @ 5 ft 32 PPM
5	10-5	2 GP	75%	ML	SILT (ML) dk greyish brown (2.54 4/2) dry, stiff, laminated, slight POL odor gradual incl with below	PID HEADSPACE = 138 PPM PID CORE - 0-31 PPM peak @ 6.7' SS0056P004-5-7 0955
10	15-10	3-6P	100%	ML	SILT (ML) v dk greyish brown (2.54 4/2) moist, stiff to v stiff laminated to thin bed, silt with organic matter, soil rebounds after depressing, no plastic, micaceous, v strong POL odor, soil cold at 13 ft, (0/0/100) gradual incl w/ below	PID HEADSPACE = 5,957 PID CORE 5-363 PPM PEAK AT 12-13 ft PID TBIT - 0.4 PPM SS0056P004-10-12 1010 NORM, MS, SD SAMPLES SAMPLED 10-13 ft for extra vol
15	20-15	4-6P	80%	ML	SILT (ML) v dk gry (2.54 3/1) moist, stiff laminated, non plastic, interbedd w/ sand (18-19 ft (0/10/90))	PID HEADSPACE PID CORE = 40-0.8 PPM PEAK @ 15-15.5
20	25-20	5-6P	65%	SP	SAND (SP) grey (104R 5/1), dry, loose, laminated to x bed, med grnd ang-sub rndd, grtz > lith > fldcp (0/95/5)	TOP OF BORG HOLE = 309 PPM BZ 0.0 PPM
25	30-25	6-6P	100%	SW	SAND (SP) dk greyish brown (2.54 4/2) moist to wet, dense, massive to fatty bed, sub ang-rndd med grnd grtz, sand trace gravel (5/90/5), gradual incl with below	PID HEADSPACE 0.4 PPM PID CORE = 0.0 PPM SS0056P004-22-29 40SD, NORM + DUPE
30				IN INTERVAL NOT SAMPLED	SAND (SP) v dk greyish brown (2.54 4/2) wet, massive, dense, med grnd sub ang-rndd grtz > lith > fldcp trace peat @ 29.5, upward frag (0/10/5)	PID CORE 0.0 PPM

PROJECT NUMBER 394439.02.RI	BORING NUMBER SS0056P004
SHEET 2 OF 2	
SOIL BORING LOG	

PROJECT GALENA POL/TO-184 LOCATION WILDERNESS HALL
 ELEVATION TBD DRILLING CONTRACTOR GEOTEK ALASKA, INC/ ANCHORAGE ALASKA
 DRILLING METHOD AND EQUIPMENT DIRECT PUSH, BE TRACK MTD GEOPROBE 6620DT
 WATER LEVELS NO WATER IN HOLE ~25 START 0915/7/10/10 FINISH 1230/7/10/10 LOGGER M GODWIN

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)	6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
8	35-30	7 GP	100%	SP	<p><u>SAND (SP)</u> ↓ drk graysh brn (2.54 4/2) wet, dense, same as above w/ trace gravel to 1/2" φ to med sand @ base (5/90/5)</p>	<p>PID HEADSPACE 0.0 PPM PID CORE 0.0 PPM SS0056P004-30-32 1145 PID TBH 52.8 PPM PID BZ 0.0 PPM</p>
35	40-35	8-GP	0%	NO RECOVERY	NO RECOVERY	
40	43-40	9-GP	85%	SW	<p><u>SAND (SW)</u> drk gray (10YR 4/1) wet, dense, massive, med grnd sub ang-rndd grtz > lith > fldspr (10/90/10)</p>	<p>PID HEADSPACE 1.0 PPM PID CORE 0.0 PPM SS0056P004-40-42 1215</p>
45	<p>TD = 43 ft bgs hole collapsed @ 20.3 ft, no water in borehole after drilling</p>					



CH2MHILL

PROJECT NUMBER

394439 02.RI

BORING NUMBER

SS0056P005

SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184

LOCATION: WILDERNESS HALL, CENTER

ELEVATION: TBD

DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska

DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 6020 DT : Hollow Stem Auger

WATER LEVELS: ~21 ft bgs

START 0925 / 7-13-15

END 1155 / 7-13-15

LOGGER: MGDW/W

DEPTH BELOW SURFACE (feet)	INTERVAL (feet)		#/TYPE SS=Split Spoon MC=Macrocore	STANDARD PENETRATION TEST RESULTS 6 - 6 in (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, % gravel/sand/silt-clay	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TIME, TESTS, AND INSTRUMENTATION. OVM/PID reading (ppm): Bkg Breathing Zone Top of Hole Sample
	RECOVERY (%)	TEST RESULTS				
5	5-0	75%	1-GP	GM	GRAVEL (GM) gray to tan brn dry, very dense, massive to thick bedded GM/GW, ang + med grnl qtz + lith + med to 2", med grnd sub rml-rnd qtz sand, ML (50/25/25) no odors	CORE PID 0.3 PPM HEADSPACE 1-2 PPM SS0056P005-0-2 0930
10	10-5	85%	2-GP	ML	SILT (ML) dk brn, moist, stiff, bedded to massive, sub concordant parting, sand silt (0.5") 3.5-4 ft, micaceous, gradational with below no odors	CORE PID 0.1-1.2 PPM HEADSPACE PID 2.5 PPM SS0056P005-5-7 0950
15	15-10	90%	3-GP	ML	CLAYEY SILT (ML) dk grayish brown, moist, stiff laminated with organic material (peaty) low plasticity, slow dilatancy no odors (0/0/100) gradational w/ below	CORE PID 0-2.8 HEADSPACE PID 6.4 SS0056P005-10-12 1020
20	20-15	90%	4-GP	SM	SILT SAND (SM) dk brown, dry, med dense, thin bedded, non plastic, f-grnd ang-sub rml-rnd qtz sand (0/50/50)	CORE PID 0-3.4 PEAK @ base of f sand @ 18 ft
25	25-20	60%	5-GP	SW	SAND (SW) dk brn to gray, med dense to loose @ base, thin bedded to massive @ base upward fining, gradational with above, no odors f-med grnd ang to rml-rnd qtz > lith > f-dspr (0/85/15)	CORE PID 0-2.8 PPM HEADSPACE PID 6-2 PPM SS0056P005-22-24 1045 NORM + MS + SD



CH2MHILL

PROJECT NUMBER

394439-02-RE

BORING NUMBER

SS0056P005

SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184

LOCATION: WILDERNES HALL CENTER

ELEVATION: TBD

DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska

DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 6620 DT : Hollow Stem Auger

WATER LEVELS ~ 21 ft bgs

START 1925 / 7-13-10

END 1155 / 7-13-10

LOGGER: M O'DOWD

DEPTH BELOW SURFACE (feet)	INTERVAL (feet)		RECOVERY (%)	#/TYPE SS=Split Spoon MC=Macrocore	STANDARD PENETRATION TEST RESULTS 6 - 6 - 6 in (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, % gravel/sand/silt-clay	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TIME, TESTS, AND INSTRUMENTATION. OVM/PID reading (ppm): Bkg Breathing Zone Top of Hole Sample
	START	END					
25	15-20	60%	5-GP	SW	SAND (SW) gradational w/ below		
				INTERVAL NOT SAMPLED			
	30-25	100%	6-GP	SW	SAND (SW) sand, gry, same as above	CORE PID 0.5 - 3.2 PPM likely moisture, no odors	
				INTERVAL NOT SAMPLED			
30	30-25	100%	6-GP	GW	GRAVEL (GW) gray, saturated, dense massive, will rnd gtl to 1" gtz > lith m-coarse med gtz > lith sub (6.5/3.5/0)		
				INTERVAL NOT SAMPLED			
	30-25	100%	6-GP	SW	SAND (SW) dk gry, wet, dense, massive, med grnd subang-rnd gtz > lith silt (5/40/5)		
				INTERVAL NOT SAMPLED			
	34-30	100%	7-GP	SW	SAND (SW) dk grysh brwn, saturated, dense, massive, med grnd gtz > lith, micaceous (0/95/5), gradational with above, no odors.	CORE PID 0 - 2.4 PPM HEADSPACE PID 3.2 PPM SS0056P005-30-32 1125 NORM + DUPE 1135	
				INTERVAL NOT SAMPLED			
35	34-30	100%	8-GP	SW	SAND (SW) same as above gradational with above, trace fine gravel 36-36.5 ft bgs	CORE PID 0 - 1.8 PPM NO ODORS	
				INTERVAL NOT SAMPLED			
	38-34	100%	8-GP	SW	SAND (SW) grysh brw, wet, med grnd subang to rnd gtz > lith, core wedged in macro core barrel, sampled from bag	CORE PID - core not recovered HEADSPACE PID - 2.9 PPM SS0056P005-40-42 1200	
				INTERVAL NOT SAMPLED			
40	42-38		9-GP	SW			
				INTERVAL NOT SAMPLED			
45							

TD = 42 ft bgs
hole collapse H₂O not measured in borehole

PROJECT NUMBER 394439.02.RI	BORING NUMBER SS0056P006	SHEET 1	OF 2
SOIL BORING LOG			

PROJECT **GALENA FOL/TO-184** LOCATION **WILDERNESS HALL, EAST SIDE**
 ELEVATION **TBD** DRILLING CONTRACTOR **GEOTEK ALASKA INC/ ANCHORAGE ALASKA**
 DRILLING METHOD AND EQUIPMENT **DIRECT PUSH, BRAGY MD GEOPROBE 6620DT**
 WATER LEVELS **APPROX 23 ft bgs** START **1350/7-10-10** FINISH **1630/7-10-10** LOGGER **M BODWIN**

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	5-0	1-6P	80%	GW	SANDY GRAVEL (ow) dk grysh brw (2-5/4/2) dry, dense, massive, med grtz + lith to 1 ft, ang-rnd med grnd grtz > lith sand (60/35/10)	PID CORE 0.0 PPM PID HEADSPACE, 0.0 PPM
				ML	SILT (ML) o/v brw (2-5/4/3) dry stiff thin bdd to laminated, slight x-bddng, micaceous, part sh bdd, gradatn w/ below, (0/0/100)	SS0056P006-0-2 ft 1415
10	10-5	2-6P	100%	ML	SILT (ML) same as above	PID TBH 0.0 PPM PID CORE 0.0 PPM PID HEADSPACE 0.0 PPM
				ML	gradatn w/ below (0/5/95)	SS0056P006-5-7
15	15-10	3-6P	90%	CL/ML	SILTY CLAY (ML/CL) dk grysh brwn (10 yr 4/2) moist, stiff, laminated, low plasticity, organic rich (0/0/100)	PID TBH 0.0 PPM PID CORE 0.0 PPM PID HEADSPACE 2.0 PPM
				ML	SILT (ML) v dk grysh brw (2-5/3/2) moist stiff, laminated, non plastic, minor limonite staining, med gradatn spe 14.5 & sh (0/10/90)	SS0056P006-10-12 1445
20	20-15	4-6P	85%	SW	SAND (SW) o/v brw (2-5/4/3), dry to moist, loose to dense, thin bdd, f-med grnd ang-rnd grtz > lith (0/90/10)	PID CORE 0.0 PPM
				SW	GRAVEL SAND (SW) v dk grysh brw (10 yr 3/2) wet, dense, massive, med to coarse grnd subang-rnd grtz > lith > fids for sand, lith + grtz + gravel to 5 ft, rnd (25/70/5)	PID CORE 0.0 PPM PID HEADSPACE 0.0 PPM SS0056P006-20-22 1505
25	25-20	5-6P	90%	SW	GRAVELLY SAND (SW)	PID CORE 0.0 PPM
				SW	wet to saturated, same as above	
30	30-25	6-6P	100%	INTERVAL NOT SAMPLED		

PROJECT NUMBER 394439.02.RI	BORING NUMBER S005GP006	SHEET 2 OF 2
SOIL BORING LOG		

PROJECT GALENA FOL/TO-184 LOCATION WILDERNESS HALL EAST
 ELEVATION TD DRILLING CONTRACTOR GEOTEK ALASKA INC, ANCHORAGE ALASKA
 DRILLING METHOD AND EQUIPMENT DIRECT PUSH, TRACK MTD GEOPROBE 6620DT
 WATER LEVELS Approx 23ft bgs START 1330/7-10-10 FINISH 1630/7-10-10 LOGGER M. GUDWIN

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
				6"-6"-6" (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30	34-30	7-GP	80%	X	<u>SAND (sw)</u> v drk grysh brw (10 yr 3/2) wet, dense, massive upward coarsening, med grnd sub ang + rnd grtz > lith > fidsp, mica, micaeous, trace gravel, no odors (5/10/5) gradual w/ below.	PID CORE 0.0 PPM PID HEADSPACE 0.0 PPM S00 S005GP006-30-32 1535
35	39-34	8-GP	85%	SW INTERVAL NOT SAMPLED	<u>SAND (sw)</u> saturated, same as above, no odors	PID CORE 0.0 PPM
40	43-39	9-GP	?	X	<u>SAND (sw)</u> v drk gry (2.54 3/1) wet, dense, massive, f-med grnd sub ang - rnd grtz > lith > trace grtz + gravel to 1/4 (5/10/5)	PID Headspace 0.0 PPM S005GP006-40-42 1620 + dup
45	TD = 43 ft hole collapsed @ 15.5 ft bgs NO water = boring after last core					

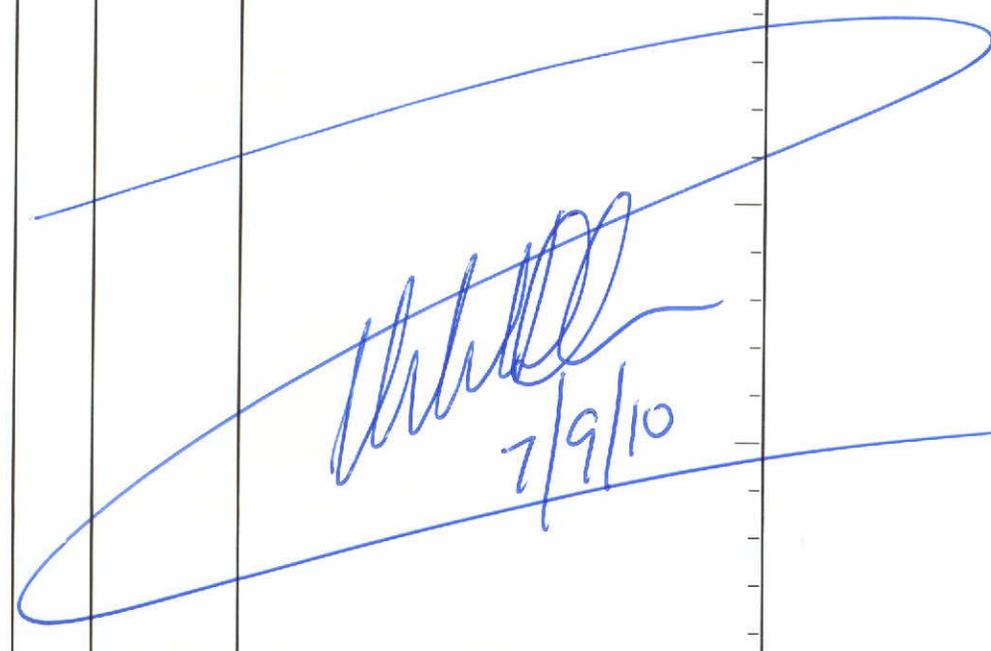
PROJECT NUMBER 394439.02.RI	BORING NUMBER SS0056P007	SHEET 1 OF 2
SOIL BORING LOG		

PROJECT GALENA POL TO-184 LOCATION SS0056P007 WILDANESS HILL
 ELEVATION TBD DRILLING CONTRACTOR GEOTEK ALASKA INC
 DRILLING METHOD AND EQUIPMENT DIRECT PUSH, ETRACK MTD GEOPROBE 6620
 WATER LEVELS OS-MW-11 19.5 FRC / 20.3 START 1445/7/19/10 FINISH 1900/7/19/10 LOGGER M. GODWIN

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	5-0	1	95%	X	<u>SILTY GRAVEL (GM)</u> drk grysh brw, dry, hard, rnd frags to 1", at road base material <u>SILT (ML)</u> drk grysh brw (2.5Y 4/2) to v drk grysh brwn (10YR 3/2), dry, firm, laminated to bdd, peat e 3A, (thin) micaceous	PID 0-2 ft HDSP 65 PPM SS0056P007 - 0-2 ft 1520 PID TOP BH 45 PPM
10	10-5	2	90%	X	<u>SILT (ML)</u> drk grysh brw (2.5Y 4/2) moist, firm, laminated, limonite staining <u>SAND (SM)</u> @ 7.5 ft bgs (0.4') 3 9 ft bgs (0.2) grysh brw (2.5Y 5/2) drk brw (7.5YR 3/2) limonite stained laminated silt to clay (cc) v drk grysh brw (10YR 3/2) at base, low plastic, firm	PID 5-7 ft bgs 10.5 PPM SS0056P007 - 5-7 ft 1550
15	15-10	3	95%	X	<u>SILT (ML)</u> v drk grysh brw (10YR 3/2) moist, stiff, laminated, limonite staining in laminations, wood at 11 ft bgs, 13.5 ft <u>SAND (SW)</u> light brownish gry (2.5Y 6/2) dry, loose, thin bdd, dry v fn qtz & sand <u>SILT (ML)</u> v drk grysh brw (2.5Y 3/2) moist, laminated, stiff, limonite stain	PID 10-12 ft 10.5 PPM SS0056P007 - 10-12 1620
20	20-15	4	95%	NO SAMPLES IN THIS INTERVAL	<u>SAND/SILT SAND (SP/SM)</u> light y lush brw (2.5Y 6/2) to v drk grysh brwn (2.5Y 3/2), stiff to loose, predom sand, fn to med, lng qtz sand, silt thin bdd to laminated, minor limonite staining in the silt layers (0/75/25)	PID 16-18 ft bgs 1.5 PPM
25	25-20	5	90%	X	<u>GRAVELLY SAND (SP)(SW)</u> v drk grysh brw (2.5Y 3/2) stiff dense, massive, med grnd subang - rnd qtz > lith > f d sp > qtzite gravel to 1/2", rnd to wll rnd lith + qtzite (25/70/5)	PID 20-25 TOP OF BH 153 PPM SS0056P007 - 22-24 1645 PID HEADSPACE 3.3 PPM
30	30-25	6	95%		<u>GRAVELLY SAND (SW)</u> v drk grysh brw (2.5Y 3/2) moist to wet, same as above less gravel e base, upward coarsening from f-med sand to coarse sand/grvl = light POL odor (20/75/5)	NOT SAMPLED CORE PID READINGS 0.0 PPM

PROJECT NUMBER 394439.02.RI	BORING NUMBER SS0056P007 SHEET 2 OF 2
SOIL BORING LOG	

PROJECT GALENA POL/TO-184 LOCATION WILDERNESS HILL
 ELEVATION TBD DRILLING CONTRACTOR GEOTEK ALASKA INC
 DRILLING METHOD AND EQUIPMENT DIRECT PUSH / GEOPROBE TRIMED 6620
 WATER LEVELS OS-MW-11 / 19.5 BTL START 1995/7/19/10 FINISH 1900/7/9/10 LOGGER M. BOONWAL

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
30	30-34 34-30	7	95%	X	SAND (sw) v dark graysh brw (2.54 3/2) wet, dense, 10-20% grvt med grnd, upward coarsening, massive to friable bdd, grt > lith (15/80/5)	PID HEADSPACE 0.0 PPM SS0056P007 - 30-32 1745
35	37.5-34 37.5-34	8	95%	NO SAMPLE THIS INTERVAL	SAND (sw) v dark graysh brw (2.54 3/2) wet, dense, massive, med grnd, sub ang to rndl grtz > lith > fld spr trace grvt to 1/2 inch (5/90/5) gradual with above (below)	PID HEADSPACE 0.0 PPM 0.0 PPM ACROSS CORE SS0056P007 - 40-42 1850
40	42.5-37.5	9	90%	X	SAND (sp) v dark graysh brw (2.54 3/2), wet, dense to v dense, massive, med grnd sub ang - rndl grtz > lith > mica. (0/95/5)	
45	<p>TB 42.5 FT BGS</p> 					



CH2MHILL

PROJECT NUMBER

394439, 02. PI

BORING NUMBER

SS0056P008

SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184

LOCATION: WILDERNESS HILL, WEST

ELEVATION: TBD

DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska

DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 1620 DT : Hollow Stem Auger

WATER LEVELS: 21 ft bgs

START: 19/5/7-13-10

END: 1800 7-13-10 LOGGER: M. BOGDAN

DEPTH BELOW SURFACE (feet)		STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
INTERVAL (feet)	RECOVERY (%)			
	#/TYPE	6 - 6 - 6 in (N)		
				DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TIME, TESTS, AND INSTRUMENTATION.
				OVM/PID reading (ppm): Bkg Breathing Zone Top of Hole Sample
5-0	75%	1-GP	<u>0.5 ft PC</u> GRAVEL (GW) gray to blv brw, dry, v hard, w/ rudd gravel to 2", sand + silt matrix, med grnd rdd grtz sand, (50/35/15) pulverized concrete top of core	CORE PID - 0.0 PPM HEADSPACE PID 0.0 PPM SS0056P008 - 0-2 1530 Driller operating gas powered generator during AK101 sampling
10-5	100%	2-GP	GRAVEL (GW) same as above	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM SS0056P008 - 5-7 1600 + TA SPLIT AK101/102/103
15-10	100%	3-GP	SILT (ML) dk grey brw dry, stiff, bdd, trace f sand micaceous, mod POL odors (0/0/100)	Hard drilling at base of run CORE PID 7.8 PPM PK @ 12 ft 7.9 PPM @ 14.5 ft HEADSPACE PID 4110 SS0056P008 - 12-14 1625, moderate POL O.
20-15	90%	4-GP	SAND (SW) dk to olv brw, dry to slightly moist, thin bdd, f grnd, ang to sub rudd grtz > 1/16" micaceous down to med grnd grey silt	CORE PID, Peak 6.2 PPM @ 15.5- 0.0 PPM balance of (0/90/10) core
25-20	75%	5-GP	SAND (SW) dk grey, wet, dense, massive to grossly bdd gravel to 1", gravel lens @ 24 ft by, med grnd grt sand (20/75/5)	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM SS0056P008 - 22-24 1700 No odors



CH2MHILL

PROJECT NUMBER

394439.02.RP

BORING NUMBER

SS0056P008

SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184

LOCATION: WILDBERESS HALL, WEST

ELEVATION: TBD

DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska

DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 6620 DT : Hollow Stem Auger

WATER LEVELS: ~21 ft bgs

START: 15/5/7-13-10

END: 1800/7-13-10 OLOGGER: M. GODWIN

DEPTH BELOW SURFACE (feet)	INTERVAL (feet)		RECOVERY (%)	#/TYPE <small>SS = Split Spoon MC = Macrocore</small>	STANDARD PENETRATION TEST RESULTS 6 - 6 - 6 in (N)	SOIL DESCRIPTION	COMMENTS
	START	END					
	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TIME, TESTS, AND INSTRUMENTATION.						
25	25-20	75%	5-6P	SW			
	30-25	90%	6-6P	INTERVAL NOT SAMPLED	6-6	SANDY GRAVEL (SW) v drk graysh brw (2-5/4 3/2), wet, dense to v dense, upward fining massive, rnd grnd to 1", med to coarse grad grt-sil (45/20/5)	CORE PID 0.0 PPM
30	35-30	90%	7-6P	SW	SW	SAND (SW) v drk graysh brw (2-5/4 3/2) wet dense, upward fining, med sub rnd-rnd grt-sil (0/45/5)	CORE PID HEADSPACE PID SS0056P008-30-32 1725
35	40-35	0%	8-6P	INTERVAL NOT SAMPLED		SAND (SW) same as above, trace w/ med gravel @ 33 ft	
40	43-40	100%	9-6P	SW	SW	SAND (SW) poor recovery, sub med grnd & sub rnd to rnd grt-sil > lith sand in drive shoe	NO PID READINGS THIS INTERVAL
45						SAND (SW) drk gry, wet, dense, massive, med grnd sub rnd to rnd grt-sil > lith micaceous (0/95/5)	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM SS0056P008-40-42 1805
						TD = 43 ft	

PROJECT NUMBER 394439.02, RI	BORING NUMBER SS0056P009	SHEET 1 OF 2
RAIN DAY SOIL BORING LOG		

PROJECT GALENA FOL TO 189 LOCATION WILDERNESS HALL SW
 ELEVATION TSD DRILLING CONTRACTOR GEOTEK ALASKA, INC ANCHORAGE AK
 DRILLING METHOD AND EQUIPMENT DIRECT PUSH, GEOPRUSE 0620DT
 WATER LEVELS ~21 ft START 10/10/7-14/10 FINISH 14/5/7/14/10 LOGGER MGDW/M

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)	6"-6"-6" (N)		
5	5-0	1-GP	75%	ML	<u>GRAVELLY SILT (ML)</u> o/v brw, dry, stiff to hard, massive, non plastic, no odors, (25/10/65)	SS0056P009_0-2 1025
10	10-5	2-GP	100%	ML	<u>SILT (ML)</u> o/v brw to drk grysh brwn, dry, stiff, laminated to bdd, strong odors 5-7 ft. Pelec PID @ 6ft-7ft bgs (0/0/100 gradual w/ below)	SS0056P009-5-7 1045 CORE PID 14.7-385 HEADPID 2877 strong solvent like or weathered POL odors
15	15-10	3-GP	100%	ML/SW SM	<u>SILT/SAND (ML/SW)</u> o/v brw dry, loose to stiff, fin bdd, intr bdd laminated silt & f sand silty sand @ base (0/50/50) mild POL odors gradual w/ below	CORE PID 3.7-8 PPM HEADSPACE PID 27 PPM SS0056P009-10-12 1115 TA SPLIT mild odors
20	20-15	4-GP	75%	ML SW	<u>SILT (ML)</u> o/v brwn, dry, stiff, laminated to fin bdd, limonite stain at 16, 18 ft, soft w/ Pt material	CORE 4-3 PPM
25	25-20	5-GP	50%	SW	<u>SAND (SW)</u> grysh brw, med dense, fin bdd, dry, med grnd sub ang-rndd grtz > lith (0/35/15) gradual w/ below	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM SS0056P009-22-24 1155
30	25-30	6-GP	90%	SW	<u>GRAVELLY SAND (SW)</u> drk gry, wet, dense, massive, will rndd grvl to 1", med to coarse sand sub ang to rndd grtz > lith (35/60/5) gradual w/ below	CORE PID 0.0 PPM
35					<u>SANDY GRAVEL (GW)</u> drk gry wet, thk bdd, dense to hard, will rndd lith grvl to 1", upward coarsening, med to coarse sub ang + rndd grtz > lith > mica (50/45/0)	

PROJECT NUMBER 334439.02.RJ	BORING NUMBER SS0056P009	SHEET 2 OF 2
SOIL BORING LOG		

PROJECT GALENA FOL TO-184 LOCATION WILDERNESS HALL, SW
 ELEVATION TBD DRILLING CONTRACTOR GEOTEK ALASKA INC, ANCHORAGE AK
 DRILLING METHOD AND EQUIPMENT DIRECT PUSH/TRECK MTD GEOPROBE 6620 DT
 WATER LEVELS ~21 ft bgs START 10/10/7-14-10 FINISH 11/15/7-14-10 LOGGER M BODWIN

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION <i>M&W</i>	COMMENTS
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
30	34-30	7-GP	100%	X	<u>SAND (sw)</u> dk grey, wet, dense massive, upward coarsening. gradual with above, med grnd subang to rndd grtz > lith >> trace qtz (s/90/s)	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM SS0056P009-30-32 1345
35	38-30	8-GP	100%	SW <i>INTERVAL NOT SAMPLED</i>	<u>SAND (sw)</u> dk grey, saturated dense, massive, 2" thick layer black/oxidic wood @ 37.5ft, med grnd subrndd-rndd grtz > lith (0/90/s)	CORE PID 0.0 PPM
40	38-42	9-GP	100%	SW X	<u>SAND (sw)</u> dk grey, saturated dense, massive trace gravel to 1/2" micaceous (large flakes) w/conspicuous coarse grnd w/ rndd grtz, med grnd subang-rndd grtz > lith > f/dsp > mica (0/90/80)	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM SS0056P009-40-42 1440
45					TD = 42 ft	



PROJECT NUMBER

394439 02 RT

BORING NUMBER

SS0056P040

SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184

LOCATION: WILDERNESS HALL SE

ELEVATION: TBD

DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska

DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 6620DT : Hollow Stem Auger-

WATER LEVELS: ~21 ft

START: 15/07-14-10

END: 09/30/7-15-10

LOGGER: M. HODGWIN

DEPTH BELOW SURFACE (feet)

STANDARD

SOIL DESCRIPTION

COMMENTS

INTERVAL (feet)

RECOVERY (%)

#/TYPE

SS=Split Spoon

MC=Macrocore

PENETRATION

TEST

RESULTS

6 - 6 - 6 in

(N)

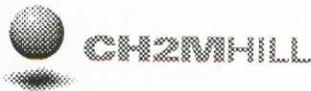
SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, % gravel/sand/silt-clay

DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TIME, TESTS, AND INSTRUMENTATION.

OVM/PID reading (ppm):

Bkg Breathing Zone Top of Hole Sample

DEPTH (ft)	INTERVAL (ft)	RECOVERY (%)	#/TYPE	PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
5	5-0	95%	1-GP	GW	<u>SANDY GRAVEL (GW) graysh brn</u> dry, hard, massive, med grnd to 1/2" med grnd ang-rnd grtz > lith sand (50/40/10)	CORE PID 2.3 PPM HEADSPACE PID 9.1 PPM SS0056P010-0-2 1600
10	10-5	60%	2-GP	ML	<u>SILT (ML) o/v brn, dry,</u> stiff, laminated to thin bed, limonite stained @ 3.5 ft, no odors, trace f.s.m. (0/5/95)	CORE PID 5.6 PPM HEADSPACE PID 1-2 PPM SS0056P010-5-7 1630
15	15-10	75%	3-GP	SM	<u>SILTY SAND (SM) o/v brn, dry,</u> stiff, thin bed, f.grnd ang-sub med grtz > lith sand (0/55/45)	CORE PID 4.6 PPM HEADSPACE PID 2.4 PPM SS0056P010-10-12 1645
20	20-15	75%	4-GP	ML/SW	<u>CLAY (CL) dark o/v brn, moist,</u> stiff, low plasticity, laminated	CORE PID 0.2 PPM
25	25-20	90%	5-GP	SW	<u>SILT & SAND (ML/SW) o/v brn to</u> graysh brn, moist, dense to stiff, laminated silt interbed w/ sand, limonite staining @ 18, 19 ft, f to med sub ang-rnd grtz > lith (0/35/65)	CORE PID 0.9 PPM HEADSPACE PID 2 PPM SS0056P010-22-24 0820
30	30-25	85%	6-GP	SW	<u>SAND (SW) graysh brn, wet, dense</u> massive, interbed coarse & med grnd sub ang-rnd grtz > lith (0/95/5)	CORE PID 0.5 PPM
35	35-30	100%	7-GP	SW	<u>GRAVEL (GP) graysh brn, wet, dense</u> massive, med grtz > lith to 3/8" (75/20/5)	CORE PID HEADSPACE PID SS0056P010-30-32 0845
					<u>SAND (SP) graysh brn, wet, dense</u> massive, upward coarsening, med grnd sub ang-rnd grtz > lith (0/95/5)	
					<u>SAND (SW) graysh brn, wet, dense</u> massive, trace gravel to 3/8" med, med grnd sub ang-rnd grtz > lith meta, micaceous. (5/90/5)	



PROJECT NUMBER 394439-02-RI	BORING NUMBER SS0056P010	SHEET 2 OF 2
SOIL BORING LOG		

PROJECT: Former Galena Forward Operating Location, Task Order 184 LOCATION: WILDERNESS HALL, SOUTH
 ELEVATION: TBD DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska
 DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 0620DT : Hollow Stem Auger
 WATER LEVELS: ~21 ft bgs START: 1540/7-14-10 END 0930/7-15-10 LOGGER: M. BOONIN

DEPTH BELOW SURFACE (feet)	INTERVAL (feet)		RECOVERY (%)	#/TYPE <small>SS=Split Spoon MC=Macrocore</small>	STANDARD PENETRATION TEST RESULTS 6 - 6 - 6 in (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, % gravel/sand/silt-clay	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TIME, TESTS, AND INSTRUMENTATION. OVM/PID reading (ppm): Bkg Breathing Zone Top of Hole Sample
	INTERVAL (feet)	RECOVERY (%)					
	INTERVAL (feet)	RECOVERY (%)					
35	38-34	100%	8-GP	INT. NOT SAMPLED	SW	SAND (SW) same as above	
40	42-38	100%	8-GP		SW	GRAVELLY SAND (sw) gray sh. brown. saturated, dense, massive, 2" thick wood debris layer @ 38 ft, gravel to 1/2" will round, med. grad. submed. med. qtz > 1/4" sand (10/05/5)	CORE PID 0.0 PPM HEADSPACE PID SS0056P010 - 40-42 0935
45							

TD = 42 ft



CH2MHILL

PROJECT NUMBER

394439.02.RI

BORING NUMBER

SS0056P001

SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184

LOCATION: SS005, SOUTH

ELEVATION: TBD

DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska

DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 6620 DT : Hollow Stem Auger

WATER LEVELS: 16.5 ft bgs

START: 2105/8-7-10

END: 2315/8-7-10

LOGGER: M GOODMAN

DEPTH BELOW SURFACE (feet)			STANDARD SAMPLE PENETRATION IN 150mm TESTS SOIL TYPE RESULTS	SOIL DESCRIPTION	COMMENTS
INTERVAL (feet)	RECOVERY (%)	#/TYPE			
5-0	100%	1-GP	6-6-6 in (N)	GRAVEL (GW) light grayish brown, moist, v dense, massive, any-rndd gravel to 1.5", any grtz med sand (50/40/10)	CORE PID 0 PPM 0.5-4.5 ft HEADSPACE PID
			ML		
10-5	85%	2-GP	GRAV	GRAVEL (GRAV) olv brwn, moist, v dense, massive, any-rndd gravel > 2 in. (50/25/25)	CORE PID 0.0 PPM 5-9.5 ft HEADSPACE PID
			SP	SAND (SP) light olv brwn, moist, med dense, massive, f any grtz sand (0/100/0)	
15-10	90%	3-GP	ML	SILT (ML) red, moist, stiff, firm oxid silt over burn layer (5/0/95)	SS0056P011-5-7 2135
			CHARCOAL	CHARCOAL (PT) black, buried wood	
20-15	95%	4-GP	SAND	SAND (SAND) light brwn, moist, med dense, thin bdd, f sand (0/70/30)	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM
			ML	SILT (ML) olv brwn, moist, stiff, thin bdd, limonite staining root structures and bedding partings (0/0/100)	
25-20	75%	5-GP	SM	SILTY SAND (SM) grayish brown, moist to wet, dense, laminated to b-bdd, f to med grnd grtz + lith (0/70/30)	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM
			SW	SAND (SW) grayish brown, wet, dense, upward fining, med grnd grtz (0/90/10)	
25-20	75%	5-GP	SW	SAND WITH GRAVEL (SW) grayish brown, wet, v dense, finly bdd to massive, sub-rndd-rndd gravel to 1 in, med grnd grtz + lith sand (25/70/5)	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM SS0056P011-22-24 2205
			SW		



PROJECT NUMBER
394439, 02, RI

BORING NUMBER
SS005GP011

SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184 LOCATION: SS005 SOUTH
 ELEVATION: TBD DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska
 DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 6620 DT : Hollow Stem Auger
 WATER LEVELS: 16.5 ft bgs START: 2105/8-7-10 END: 2315/8-7-10 LOGGER: M. GOODWIN

DEPTH BELOW SURFACE (feet)	INTERVAL (feet)		STANDARD PENETRATION TEST RESULTS 6 - 6 - 6 in (N)	SOIL DESCRIPTION	COMMENTS	
	RECOVERY (%)	#/TYPE SS = Silt Spoon MC = Macrocore				
25	25-20	5-6P	SW	SAND WITH GRAVEL (SW) ↑ ↑ gradational with below	↑ see previous page	
30	30-25	85%	6-6P	GW	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM	
30	30-25	85%	6-6P	SW	SANDY GRAVEL (GW) grayish brown, wet, dense, upward fining, grtz + lith gravel to 2" well rndd, med to coarse grtz + lith sand, GP at base. (50/90/10)	HEADSPACE PID 0.0 PPM
30	30-25	85%	6-6P	SW	SAND (SW) gray, wet, dense, massive, med grnd f - med grnd subang - rndd grtz + lith sand (0/95/5)	INTERVAL NOT SAMPLED
35	35-30	90%	7-6P	SW	SAND (SW) black, (stained) wet, same as above but with POL staining, strong light end POL odors, sheen in core, sample moved to contaminated layer	LORE PID 31 10 32 17 33 1005 34 787 34.5 103 HEADSPACE PID 1900 SS005GP011-32-34 2240
35	35-30	90%	7-6P	SW	SAND (SW) grayish brown, wet, same as above, not stained	LORE PID 35 2.0 PPM 36 1.8 37 5.2 38 3.1 38.5 1.2 HEADSPACE PID 7 PPM SS005GP01150-37 for Ø270 SIM 2310
35	35-30	90%	7-6P	WOOD CHIPS	wood chips, burned wood, pine cone bits with sand, 3 in thk	
35	35-30	90%	7-6P	SW	SAND (SW) gray, wet, finly bld, dense, slight POL odors, med grnd sub ang - rndd grtz + lith sand. (0/95/5)	
40	40-35	100%	8-6P	SW	SAND (SW) gray, wet, finly bld, dense, slight POL odors, med grnd sub ang - rndd grtz + lith sand. (0/95/5)	
40	40-35	100%	8-6P	SW	SAND (SW) gray, wet, finly bld, dense, slight POL odors, med grnd sub ang - rndd grtz + lith sand. (0/95/5)	
42	42-40	100%	9-6P	SW	SAND (SW) gray, wet, same as above	CORE PID 0.5-2.5 PPM HEADSPACE PID 10 PPM SS005GP011-40-42 2320
42	42-40	100%	9-6P	SW	SAND (SW) gray, wet, same as above	

TD = 42'



CH2MHILL

PROJECT NUMBER

394439 02-RI

BORING NUMBER

SS0056P012

SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184

LOCATION: SS005, SOUTHWEST

ELEVATION: TBD

DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska

DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 6620DT : Hollow Stem Auger

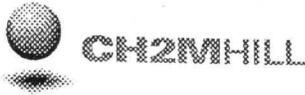
WATER LEVELS: 16.5 ft bgs

START: 2330/8/10

END: 0255/8-8-10

LOGGER: M 6000WJW

DEPTH BELOW SURFACE (feet)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	COMMENTS
INTERVAL (feet)	RECOVERY (%)	#/TYPE	6 - 6 - 6 in (N)		
5-0	100%	1-GP	GW GW	GRAVEL (GW) dk brwn, moist, dense, massive, sub ang to med gravel > 2 in, med to coarse qtz sand. (65/30/5)	CORE PID 0 PPM HEADSPACE PID 5 PPM SS0056P012_0-2 2340
10-5	100%	2-GP	GM ML ML SM	SILT (#ML) dk brwn, moist, mod stiff, laminated, wood @ 6-7 ft, upward fining to plastic silt, minor limonite staining in root structures (0/0/100)	CORE PID 0-0.5 PPM HEADSPACE PID 2 PPM SS0056P012_5-7 2350
15-10	100%	3-GP	SP SP SM	SAND (SP) light brwn, dry, thin bdd, f-grnd ang qtz sand with trace silt, (0/100/0) gradual with above/below	CORE PID 0.0 PPM HEADSPACE PID 0.5 PPM SS0056P012_10-12 0000
20-15	100%	4-GP	SM	SILTY SAND (SM) light brwn, slightly moist, thin bdd, mod dense, f-grnd ang qtz sand with silt (0/75/25)	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM
25-20	75%	5-GP	SW SW	SAND (SW) grayish brwn, wet, dense, upward fining, with med gravel to 1/2 in, med-grnd qtz sand (20/75/5)	INTERVAL NOT SAMPLED
				GRAVELLY SAND (SW) grayish brwn, wet, dense, massive, with med gravel to 1/2 in, med-grnd sub ang - med qtz + lith sand	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM SS0056P012_22-24 0025



PROJECT NUMBER
334439-02-RT

BORING NUMBER
SS0056P012 SHEET 2 OF 2

SOIL BORING LOG

PROJECT: FORMER GALENA FOL TO-184 LOCATION: SS005, SOUTHWEST

ELEVATION: _____ DRILLING CONTRACTOR: Precision Sampling, Inc., Richmond, GA GEOTEK, AK

DRILLING METHOD AND EQUIPMENT: DIRECT PUSH, GEOPROBE 6620 DT

WATER LEVELS: 16.5 ft bgs START: 2330/8-7-10 END: 0255/8-8-10 LOGGER: M. GODWIN

DEPTH BELOW SURFACE (feet)	INTERVAL (feet)		RECOVERY (%)	#/TYPE SS=Split Spoon ST= Shelby Tube	STANDARD PENETRATION TEST RESULTS 6 - 6 - 6 in (N)	SOIL DESCRIPTION	COMMENTS			
	Interval	Recovery						Standard Penetration Test Results	Soil Description	Comments
25	25-20	75%	5-GP	SW	See previous page	↑				
30	30-25	50%	6-GP	SW	SAND (SW) grayish brown, wet, dense, upward weathering weathering with above, f - med grnd sub ang to med grtz + lith sand and silt (0/80/20) gradual with below	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM				
35	35-30	90%	7-GP	SW	SAND (SW) dk grayish brown, wet, dense, massive, med grnd med grtz + lithic sand, micaceous micaceous, trace gravel to 3/8" (5/90/5)	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM SS0056P012-30-32 0220 + TA SPLIT				
40	40-35	100%	8-GP	SW	SAND (SW) same as above	CORE PID 0.0 PPM				
42	42-40		9-GP	SW	SAND (SW) dk gray, wet, dense, massive, med grnd sub ang - med grtz + lith sand (0/85/5)	CORE PID 0 - 1.1 HEADSPACE PID 3.2 PPM SS0056P012-40-42 0300				
					TD = 42'					



PROJECT NUMBER: 394439.02.RI BORING NUMBER: SS0056P013 SHEET 1 OF 2

SOIL BORING LOG

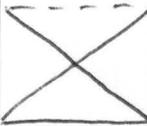
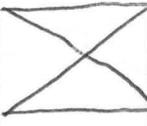
PROJECT: Former Galena Forward Operating Location, Task Order 184 LOCATION: SS005 WEST
 ELEVATION: TBD DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska
 DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe, 6620 DT : Hollow Stem Auger
 WATER LEVELS: 15.5 ft bgs START: 03/15/8-8:10 END: 05/00/88-10 LOGGER: M.GODWIN

DEPTH BELOW SURFACE (feet)	INTERVAL (feet)		RECOVERY (%)	#/TYPE SS=Split Spoon MC=Macrocore	STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION	COMMENTS
					6 - 6 - 6 in (N)	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, % gravel/sand/silt-clay	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TIME, TESTS, AND INSTRUMENTATION.
						OVM/PID reading (ppm): Bkg Breathing Zone Top of Hole Sample	
5	5-0	90%	1-GP	GW	GRAVEL (GW) o/v brown, moist, v dense, massive, ang to rndd gravel to >2 inches, med grad ang-rndd grtz + lth. (65/25/10)	CORE PID 0.1-0.3 ppm HEADSPACE PID 0.4 ppm SS0056P013-0-2 0325	
				GW			
10	10-5	100%	2-GP	SP	SAND (SP) dry, light brown, dry, fin bdd, mod stiff to dense, f gmd ang grtz sml (0/100/0)	CORE PID 0 ppm HEADSPACE PID 0 ppm	
				SM	SILTY SAND (SM) brown, moist, stiff laminated, minor limonite stain reg. (0/50/50)	SS0056P013-5-7 0330 + DUPE 0340	
				ML	SILT (ML) brown, moist, stiff, low plasticity, mod dilatency, micaceous (0/0/100) gradational w/ below		
15	15-10	80%	3-GP	ML	SILT (ML) brown, moist, stiff, low plasticity, mod dilatency, micaceous (0/0/100) gradational w/ below	CORE PID 0.0 ppm	
				SM	SILTY SAND (SM) light o/v brown, slightly moist, loose to mod dense, thin bdd, micaceous, v f to fn, grad ang grtz sml. (0/50/50)	HEADSPACE PID 0.0 ppm	
				SM	SAND (SM) light o/v brown, moist, mod dense, med grad grtz + lth sub ang to rndd sand (0/90/10)	SS0056P013-10-12 0345	
20	20-15	90%	4-GP	SW	SAND (SW) light o/v brown, moist, mod dense, med grad grtz + lth sub ang to rndd sand (0/90/10)	CORE PID 0.0 ppm	
				ML	SILT (ML) dark brown, moist to wet, fin bdd to x-bdd, micaceous, low plasticity, rapid dilatency, gradational with above (0/10/90)	HEADSPACE PID 0.0 ppm	
				SW	SAND (SW) grayish brown, wet, dense, massive to finly bdd, med grad sub ang-rndd grtz sml (0/90/10) limonite stained @ 18.75 ft bgs contact with silt above	CORE PID 0.0 ppm	
25	25-20	90%	5-GP	SW	SAND (SW) grayish brown, wet, dense, massive to finly bdd, med grad sub ang-rndd grtz sml (0/90/10) limonite stained @ 18.75 ft bgs contact with silt above	HEADSPACE PID 0.0 ppm	
				SW	SAND WITH GRAVEL (SW) grayish brown, wet, dense, massive, upward fining, gradational with above, med grad (85/80/5)	SS0056P013-22-24 0400	



PROJECT NUMBER 394439-02-RI	BORING NUMBER SS005GPO13	SHEET 2 OF 2
SOIL BORING LOG		

PROJECT: Former Galena Forward Operating Location, Task Order 184 LOCATION: SS005 WEST
 ELEVATION: TBD DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska
 DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 6620DT : Hollow Stem Auger
 WATER LEVELS: 15.5 ft bgs START 0315/8-8-10 END: 0500/8-8-10 LOGGER: M Godwin

DEPTH BELOW SURFACE (feet)	INTERVAL (feet)			STANDARD PENETRATION TEST RESULTS 6 - 6 - 6 in (N)	SOIL DESCRIPTION	COMMENTS
	RECOVERY (%)	#/TYPE				
		SS=Split Spoon	MC=Macrocore			
25	25-20	90%	5-GP	SW	<u>SAND (sw)</u> see previous page gradational with below	
	30-25	90%	6-GP	SW	<u>SAND (sw)</u> grayish brown, wet, dense, massive, f-med grad sub rmd - rmd grtz + lith. sand, trace gravel to 1/2" @ base (5/90/5) gradational with below	CORE PID 0-0.1 PPM HEADSPACE PID 0.3 PPM
30	35-30	90%	7-GP	 SW	<u>SAND (sw)</u> grayish brown, wet, dense, same as above. less gravel, larger clasts to 1" (0/95/5)	CORE PID 0 PPM HEADSPACE PID 0.2 PPM SS005GPO13-30-32 0430
35	40-35	100%	8-GP	SW	<u>SAND (sw)</u> gray, wet, dense, massive, med grad rmd, grtz + lith sand (0/95/5) gradational with below	CORE PID 0-0.4 between 36-37ft HEADSPACE PID 0.6 PPM
40	42-40		9-GP		<u>SAND (sw)</u> same as above, str faint. POL odors 40-42ft.	CORE PID 0-0.5 PPM HEADSPACE PID 2.0 PPM SS005GPO13-40-42 0505
42					<u>TID = 42'</u>	



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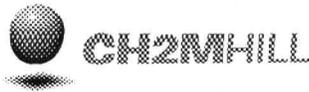
PROJECT NUMBER
394439-02 RI

BORING NUMBER
SS0056P014 SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184 LOCATION: SS005, WEST
 ELEVATION: TBD DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska
 DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 6620 DT : Hollow Stem Auger
 WATER LEVELS: 16 ft bgs START: 2005/8-310 END: 225/8940 LOGGER: M GOODWIN

DEPTH BELOW SURFACE (feet)	INTERVAL (feet)		STANDARD PENETRATION TEST RESULTS 6 - 6 in (N)	SOIL DESCRIPTION	COMMENTS
	RECOVERY (%)	#/TYPE			
5	5-0	85%	1-GP	GW GW SANDY ORANGE (GW) grayish brown, dry, v dense, massive, dry-molded gravel to 1.5 inches, med grain sand, trace silt (65/30/5)	CORE PID 0 PPM HEADSPACE PID 0 PPM
5	5-10	90%	2-GP	SM SILT (SM) drk grayish brown, dry, mod dense, thin bdd, v f ground ang grtz sand with silt (0/85/15) gradational with below	SS0056P014-0-2 2055 CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM
10	10-5	90%	2-GP	SM ML SILT (ML) drk grayish brown, dry, stiff, laminated, rootled with limonite staining in root struct (0/80/90)	SS0056P014-5-7 2100
15	15-10	100%	3-GP	SM SM SILT (SM) drk grayish brown, dry, mod dense, thin bdd, v f ground ang grtz sand gradational with below (0/20/30)	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM
15	15-20	100%	3-GP	ML SILT (ML) drk grayish brown, moist stiff, laminated, plastic, limonite staining at base in partings (0/5/95)	SS0056P014-10-12 2110 + DUPE 2120
20	20-15	100%	4-GP	SP ML SAND (SP) grayish brown, moist dense, upward fining, med to fine grain grtz sand (0/100/0)	CORE PID 0 PPM HEADSPACE PID 0 PPM
20	20-15	100%	4-GP	SW SILT (ML) gray to grayish brown, wet, stiff, laminated to x-bdd, low plasticity, micaceous, limonite staining ~ 1/2" thick @ 16.5-17 ft (0/0/100), sharp contact w/ below	CORE PID 0 PPM
25	25-20	90%	5-GP	SW SAND (SW) grayish brown, wet, dense, upward fining, coarse to v fine grtz + lith + metal sand (0/95/5)	CORE PID HEADSPACE PID
25	25-20	90%	5-GP	SW GRAVELLY SAND (SW) grayish brown, wet, dense, gradational w/ above, upward fining gravel to 3/8 (20/75/5)	SS0056P014-22-24 2135 + TA SPLIT



PROJECT NUMBER
394439 02.RI

BORING NUMBER
SS0056P014

SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184

LOCATION: SS005, WEST

ELEVATION: TBD

DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska

DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 6620 DT : Hollow Stem Auger

WATER LEVELS: 16 ft bgs START: 2005/8-10 END: 2005/8-9/10 LOGGER: M BOOWIN

DEPTH BELOW SURFACE (feet)	STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION	COMMENTS
	INTERVAL (feet)	RECOVERY (%)		
			SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, % gravel/sand/silt-clay	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TIME, TESTS, AND INSTRUMENTATION. OVM/PID reading (ppm): Bkg Breathing Zone Top of Hole Sample
25		5-GP	SW GRAVELY SAND (sw) sec above 3 upward fishing sequences	
30-25	100%	6-6P	SW SAND WITH GRAVEL (sw) grayish brown, wet, massive, med grnd subang - rdd grtz + lith + meta sand, wll rdd gravel to 1" (10/95/5), 0.25' thick layer of sand, wood debris, charcoal at top of core	CORE PID 0.0 PPM HEADSARE PID 0.0 PPM
35-30	100%	7-GP	SW SAND (sw) grayish brown, wet, dense, massive, med to fine grnd. subang - rdd grtz + lith + meta; trace gravel to 1.5" meta, grtz, granite (5/90/5) NO ODORS, med POL (mid range) in headsare bgs, no discoloration of soil	CORE PID 0 PPM at 30, 31, 32, 33, 34 HEADSARE PID 305 PPM SS0056P014 - 30-32 2200 ADD BZTOL-SIM
40-35	100%	8-GP	SW SAND (sw) gray, wet, dense, faint upward fishing, wood chips + charcoal at 36 ft bgs, no POL odors, trace gravel to 1", med grnd subang - rdd grtz + lith + meta sand, (5/90/5)	CORE PID 0-0.4 PPM HEADSARE PID 2 PPM
42-40		9-6P	SW SAND (sw) gray, wet, same as above	CORE PID 0-0.5 PPM HEADSARE PID 2 PPM
42		6P	GP GRAVEL (GP) gray, wet, loose, well rdd grvl to 1/2" (100/0/0) TD = 42'	SS0056P014 - 40-42 0.5 PPM @ base 2230



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PROJECT NUMBER
394439-02-RE

BORING NUMBER
SS0056P015 SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184 LOCATION: SS005, WEST
 ELEVATION: TBD DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska
 DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe, 6620 DT : Hollow Stem Auger
 WATER LEVELS: 16 ft bgs START 2250/8-8-10 END 0020/8-9-10 LOGGER: M. GODWIN

DEPTH BELOW SURFACE (feet)	STANDARD PENETRATION TEST RESULTS			SOIL DESCRIPTION	COMMENTS	
	INTERVAL (feet)	RECOVERY (%)	#/TYPE SS=Split Spoon MC=Macrocore			
						6 - 6 in (N)
5	5-0	90%	1-GP	GW	SANDY GRAVEL (GW) light grayish brown, dry, v dense, massive ang to rndd gravel to 1.5 inches (grtzt, meta, vol, granite) med grnd ang - rndd grtz + lith sand, (65/25/10)	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM SS0056P015-0-2 2255
10	10-5	70%	2-GP	GW GW ML	SANDY GRAVEL (GW) same as above	CORE PID 0.0 PPM HEADSPACE PID 0 PPM SS0056P015-5-7 2305 + TA SPLIT
15	15-10	100%	3-GP	ML	SILT (ML) dk grayish brown, moist, stiff, laminated, limonite staining in root structures/partings (0/0/100)	CORE PID 0.0 PPM HEADSPACE PID 0.0 PPM SS0056P015-10-12 2315 + MS/MSD
20	20-15	100%	4-GP	ML	SILT (ML) gradational with above, same as above moist to wet @ 16ft + bgs prominent limonite @ 18 ft (0/10/90)	CORE PID 0.7 @ 16 0 PPM below HEADSPACE PID 0 PPM
25	25-20	100%	5-GP	SW SW	SAND (SW) grayish brown, wet, upward fining, sharp contact with above, med grnd silty ang - rndd grtz + lith (0/90/10) gradational w/ below	CORE PID 0-0.2 PPM HEADSPACE PID SS0056P015-22-24 2335
					GRAVELLY SAND (SW) grayish brown, wet, massive, med to coarse ang - rndd grtz sand, rndd gravel to 1" (10/85/5)	



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PROJECT NUMBER
394439-02, RI

BORING NUMBER
SS0056015

SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Former Galena Forward Operating Location, Task Order 184 LOCATION: SS005, WEST
 ELEVATION: TBD DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska
 DRILLING METHOD AND EQUIPMENT: Direct Push, Geoprobe 620DR : Hollow Stem Auger
 WATER LEVELS: 16 P7 bags START: 2230/8-9-10 END: 0030/8-9-10 LOGGER: M GODWIN

DEPTH BELOW SURFACE (feet)	INTERVAL (feet)		RECOVERY (%)	#/TYPE <small>SS=Split Spoon MC=Macrocore</small>	STANDARD PENETRATION TEST RESULTS 6 - 6 - 6 in (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, % gravel/sand/silt-clay	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TIME, TESTS, AND INSTRUMENTATION. OVM/PID reading (ppm): Bkg Breathing Zone Top of Hole Sample
	START	END					
25	25-25		5-GP	SW	see previous page	↑	
30	30-25	100%	6-GP	SW	SAND (SW) grayish brown, wet, dense, massive, upward fining f-med grad grtz + lith submd-mud (0/95/5)	CORE PID 0-0.2 PPM HEADSPACE PID 10 PPM SLIGHT POL ODORS BUT NO PID RESPONSE	
35	35-30	90%	7-GP	SW	SAND (SW) same as above, slight POL odor in core, med med range to heavy range POL in headspace (0 posts) grad to med w/ below	CORE PID 18.9 @ 31 35.5 @ 32 2.5 @ 34 HEADSPACE PID 197 PPM SS0056015-30-32 2355 / add PPH to sample	
40	40-35	100%	8-GP	SW	SAND (SW) gray, wet, dense, faintly bedd, med grad med grad grtz + lith + meta sand, trace med grad gravel to 1/2" (5/90/5)	CORE PID 0-0.2 PPM HEADSPACE PID 1 PPM	
42	42-40		9-GP	SW GP	SAND (SW) same as above GRAVEL (GP) gray, wet, loose, will med grad gravel to 1/2 inch. grtz > granitic > meta gneiss > volcanic tr. (100/0/0)	CORE PID 0-0 PPM HEADSPACE PID 1.2 PPM SS0056015-40-42 0035	
					TD = 42'		

SOIL BORING LOG

PROJECT NAME: Former Galena Forward Operating Location, Task Order 184		HOLE DEPTH (ft): 38.00	DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska	
SURFACE ELEVATION: 137.80 feet	NORTHING (UTM ZONE 4N): 7180974.53	EASTING (UTM ZONE 4N): 597339.00	DATE STARTED: 7/20/2010	DATE COMPLETED: 7/20/2010
WATER LEVEL: --- feet bgs	DRILLING METHOD: Direct Push		DRILLING EQUIPMENT: Geoprobe 6620 DT	
LOCATION: JP4 Fill Stands, East			LOGGED BY: M. Godwin	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	SAMPLE #	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION			SOIL DESCRIPTION	OVM (ppm):		COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
					%G	%S	%F		PID CORE	HEAD SPACE	
1	70		DP-1		65	25	10	GRAVEL (GW) , grayish brown, dry, dense, massive, rounded gravel to 2 inches, silty medium grained quartz>lithics>metamorphic sands.	0	0	11:30 Soil sample ST009GP015_0-2 and TA split collected at 0 to 2 feet bgs.
2											
3								SILT (ML) , dark olive brown, moist, medium stiff, finely bedding, limonite staining in root holes, subconoidal fracture in parting, non plastic, moderate dilatancy, trace fine sand.	0	0	11:35 Soil sample ST009GP015_5-7 collected at 5 to 7 feet bgs.
4											
5	70		DP-2		0	5	95				
6								SILTY SAND (SM) , dark brown, dry, interbedded ML/SW, dense, medium grained, angular quartz sand.			
7											
8								SAND (SW-SM) , light grayish brown, dry to moist, medium dense, interbedded silty sand and sand, fine to medium grained subangular to rounded quartz/lithic/metamorphic sands.	0	0	11:45 Soil sample ST009GP015_10-12 collected at 10 to 12 feet bgs.
9											
10	70		DP-3		0	75	25				
11								SAND (SW) , light grayish brown, dry to moist, medium dense, interbedded silty sand and sand, fine to medium grained subangular to rounded quartz/lithic/metamorphic sand.			
12											
13								SAND (SW) , grayish brown, wet, dense, massive, medium coarse sand with wellrounded gravel to 3/8 inches, used oil/used hydraulic fluid odor in this core, gradatiel with below.	0	0	12:00 Soil sample ST009GP015_18-20 collected at 18 to 20 feet bgs.
14											
15	75		DP-4		50	40	10				
16								GRAVELLY SAND (SW) , dark grayish brown wet, dense, massive, medium to coarse grained, quartz>lithic>metamorphic sands, well graded gravel to 1/2 inch.			
17											
18									0		Interval 20 to 25 feet bgs not sampled.
19											
20	85		DP-5		20	75	5				
21											
22											
23											
24											
25											

SOIL BORING LOG

PROJECT NAME: Former Galena Forward Operating Location, Task Order 184		HOLE DEPTH (ft): 38.00	DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska	
SURFACE ELEVATION: 139.44 feet	NORTHING (UTM ZONE 4N): 7180952.27	EASTING (UTM ZONE 4N): 597356.97	DATE STARTED: 7/21/2010	DATE COMPLETED: 7/21/2010
WATER LEVEL: --- feet bgs	DRILLING METHOD: Direct Push		DRILLING EQUIPMENT: Geoprobe 6620 DT	
LOCATION: JP4 Fill Stands, East			LOGGED BY: N. Kinnebrew	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	SAMPLE #	SPT RESULTS 6"-6"-6"-6"-6" (N)	SIZE DISTRIBUTION			SOIL DESCRIPTION	OVM (ppm):		COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
					%G	%S	%F		PID CORE	HEAD SPACE	
1		85	DP-1		70	20	10	GRAVEL (GW) , grayish brown, dry, very dense, massive rounded gravel to 2 inches, medium grained quartz sand, 2-inch layer of wood chips near bottom, some upward fining.	0	0	16:05 Soil sample ST009GP016_0-2 collected at 0 to 2 feet bgs. 16:15 Soil sample ST009GP916_0-2 collected at 0 to 2 feet bgs.
2											
3											
4											
5											
6		95	DP-2		0	5	95	SILT (ML) , dark grayish brown to olive brown, dry to moist, laminated.	0	0	16:20 Soil sample ST009GP016_5-7 collected at 5 to 7 feet bgs.
7											
8											
9											
10											
11		90	DP-3		10	85	5	SAND (SW) , light gray to brown, moist, very dense, fine to medium grained, some lamination, upward fining with increased gravel at lower 6 inches of base.	0	0	16:25 Soil sample ST009GP016_10-12 collected at 10 to 12 feet bgs.
12											
13											
14											
15											
16		80	DP-4		20	65	5	SAND (SW) , same as above, increase in gravel.	0	0	
17											
18											
19											
20											
21		75	DP-5		15	80	5	SAND (SW) , grayish brown, wet, very dense, medium to fine grained, some medium gravel.	0	0	16:35 Soil sample ST009GP016_18-20 collected at 18 to 20 feet bgs.
22											
23											
24											
25											

SOIL BORING LOG

PROJECT NAME: Former Galena Forward Operating Location, Task Order 184		HOLE DEPTH (ft): 38.00	DRILLING CONTRACTOR: Geotek Alaska, Anchorage, Alaska	
SURFACE ELEVATION: 139.44 feet	NORTHING (UTM ZONE 4N): 7180952.27	EASTING (UTM ZONE 4N): 597356.97	DATE STARTED: 7/21/2010	DATE COMPLETED: 7/21/2010
WATER LEVEL: --- feet bgs	DRILLING METHOD: Direct Push		DRILLING EQUIPMENT: Geoprobe 6620 DT	
LOCATION: JP4 Fill Stands, East			LOGGED BY: N. Kinnebrew	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	SAMPLE #	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION			SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm):		COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
					%G	%S	%F		PID CORE	HEAD SPACE	
26			DP-6						0	0	16:55 Soil sample ST009GP016_26-28 collected at 26 to 28 feet bgs.
27					60	30	10	GRAVEL (GW) , brown to black, wet, very dense, massive rounded gravel up to 1 inch, medium grained quartz sand.			
28											
29											Interval 30 to 35 feet bgs not sampled.
30											
31			DP-7		50	40	10	GRAVEL (GW) , dark gray to black, wet, very dense, massive gravel to 1 inch, interbedded sand layer towards the bottom.	0	0	
32											17:25 Soil sample ST009GP016_36-38 collected at 36 to 38 feet bgs.
33											
34											
35											17:25 Soil sample ST009GP016_36-38 collected at 36 to 38 feet bgs.
36			DP-8						0	0	
37								SAND (SW) , dark gray, wet, very dense, medium grained, angular.			
38											

Boring Terminated at 38 feet bgs

Appendix B
Reference Tables and Figure

APPENDIX B

Tables

TABLE B-1

Groundwater Levels

Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena Forward Operating Location, Alaska

LOCID	LOGDATE	ELEV	WL_ELEV	Depth (bgs)
05-MW-06R	6/17/2001	142.339	137.56	4.78
05-MW-06R	10/24/2003	142.339	123.88	18.46
05-MW-06R	4/6/2004	142.339	116.69	25.65
05-MW-06R	5/23/2004	142.339	125.84	16.50
05-MW-06R	10/20/2004	142.339	120.63	21.71
05-MW-06R	10/1/2009	142.339	127.1	15.24
05-MW-06R	7/10/2010	142.339	127.95	14.39
05-MW-06R	7/19/2010	142.339	129.06	13.28
05-MW-06R	9/22/2010	142.339	128.64	13.70
05-MW-06R	10/16/2010	142.339	124.04	18.30
05-MW-11	7/4/1992	146.105	138.88	7.22
05-MW-11	9/1/1992	146.105	130.14	15.97
05-MW-11	7/1/1993	146.105	134.37	11.74
05-MW-11	8/18/1993	146.105	129.85	16.26
05-MW-11	1/8/1994	146.105	122.55	23.56
05-MW-11	10/1/1998	146.105	126.75	19.36
05-MW-11	6/1/1999	146.105	128.47	17.64
05-MW-11	8/1/1999	146.105	131.67	14.44
05-MW-11	10/1/1999	146.105	122.57	23.54
05-MW-11	6/1/2000	146.105	133.16	12.95
05-MW-11	10/1/2000	146.105	129.8	16.31
05-MW-11	6/17/2001	146.105	137.3	8.80
05-MW-11	10/1/2001	146.105	127.33	18.78
05-MW-11	10/24/2003	146.105	124.23	21.88
05-MW-11	10/20/2004	146.105		146.11
05-MW-11	7/12/2010	146.105	127.78	18.33
05-MW-11	7/19/2010	146.105	128.67	17.44
05-MW-11	9/22/2010	146.105	126.16	19.95
05-MW-11	10/15/2010	146.105	121.96	24.15
05-MW-13	10/6/1993	145.343	129.32	16.02

TABLE B-1

Groundwater Levels

Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena Forward Operating Location, Alaska

LOCID	LOGDATE	ELEV	WL_ELEV	Depth (bgs)
05-MW-13	1/8/1994	145.343	122.44	22.90
05-MW-13	1/8/1994	145.343	122.44	22.90
05-MW-13	10/1/1998	145.343	126.3	19.04
05-MW-13	6/1/1999	145.343	125.18	20.16
05-MW-13	8/1/1999	145.343	128.58	16.76
05-MW-13	10/1/1999	145.343	122.01	23.33
05-MW-13	6/1/2000	145.343	132.96	12.38
05-MW-13	6/17/2001	145.343	137.12	8.22
05-MW-13	10/1/2001	145.343	126.84	18.50
05-MW-13	10/24/2003	145.343	123.6	21.74
05-MW-13	4/6/2004	145.343	116.18	29.16
05-MW-13	10/20/2004	145.343	120.19	25.15
05-MW-13	10/1/2009	145.343	128.5	16.84
05-MW-13	7/11/2010	145.343	128.12	17.22
05-MW-13	7/19/2010	145.343	129.23	16.11
05-MW-13	9/22/2010	145.343	128.73	16.61
05-MW-13	10/16/2010	145.343	124.27	21.07
05-MW-18	6/17/2001	143.198	137.89	5.31
05-MW-18	10/24/2003	143.198	123.59	19.61
05-MW-18	4/8/2004	143.198	117.26	25.94
05-MW-18	8/4/2004	143.198	128.09	15.11
05-MW-18	8/18/2004	143.198	127.77	15.43
05-MW-18	10/26/2004	143.198	119.94	23.26
05-MW-18	10/1/2009	143.198	127.1	16.10
05-MW-18	7/10/2010	143.198	128.17	15.03
05-MW-18	7/19/2010	143.198	129.19	14.01
05-MW-18	9/22/2010	143.198	128.52	14.68
05-MW-18	10/15/2010	143.198	123.74	19.46
1837-MW-01	6/17/2001	147.993	137.2	10.79
1837-MW-01	10/20/2004	147.993	120.77	27.22
1837-MW-01	10/1/2009	147.993	126.5	21.49
1837-MW-01	7/12/2010	147.993	128	19.99
1837-MW-01	7/19/2010	147.993	128.9	19.09
1837-MW-01	10/5/2010	147.993	126.68	21.31

TABLE B-1

Groundwater Levels

Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena Forward Operating Location, Alaska

LOCID	LOGDATE	ELEV	WL_ELEV	Depth (bgs)
1837-MW-01	10/15/2010	147.993	124.64	23.35
1837-MW-02	6/17/2001	147.005	137.25	9.76
1837-MW-02	10/20/2004	147.005	120.69	26.32
1837-MW-02	10/1/2009	147.005	126.4	20.61
1837-MW-02	7/12/2010	147.005	127.86	19.15
1837-MW-02	7/19/2010	147.005	128.78	18.23
1837-MW-02	10/5/2010	147.005	126.66	20.35
1837-MW-02	10/15/2010	147.005	124.6	22.41
2541-MW-01	10/25/2003	144.343	122.67	21.67
2541-MW-01	4/8/2004	144.343	116.14	28.20
2541-MW-01	5/22/2004	144.343	125.64	18.70
2541-MW-01	10/1/2009	144.343	127.5	16.84
2541-MW-01	7/10/2010	144.343	128.6	15.74
2541-MW-01	7/14/2010	144.343	129.45	14.89
2541-MW-01	9/23/2010	144.343	128.44	15.90
2541-MW-01	10/15/2010	144.343	123.55	20.79
2541-MW-02	10/25/2003	143.526	122.75	20.78
2541-MW-02	4/8/2004	143.526	116.2	27.33
2541-MW-02	5/22/2004	143.526	126.6	16.93
2541-MW-02	10/1/2009	143.526	127.5	16.03
2541-MW-02	7/10/2010	143.526	128.62	14.91
2541-MW-02	7/11/2010	143.526	128.62	14.91
2541-MW-02	7/14/2010	143.526	129.41	14.12
2541-MW-02	9/23/2010	143.526	128.38	15.15
2541-MW-02	10/15/2010	143.526	123.51	20.02
2541-MW-03	5/22/2004	146.5	126.97	19.53
2541-MW-03	10/1/2009	146.5	127.3	19.20
2541-MW-03	7/10/2010	146.5	128.15	18.35
2541-MW-03	7/14/2010	146.5	129.09	17.41
2541-MW-03	9/23/2010	146.5	128.45	18.05
2541-MW-03	10/15/2010	146.5	123.56	22.94
2541-MW-04	10/25/2003	143.725	122.3	21.43
2541-MW-04	4/8/2004	143.725	115.79	27.94
2541-MW-04	5/22/2004	143.725	126.2	17.53

TABLE B-1

Groundwater Levels

Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena Forward Operating Location, Alaska

LOCID	LOGDATE	ELEV	WL_ELEV	Depth (bgs)
2541-MW-04	10/1/2009	143.725	127.5	16.23
2541-MW-04	7/10/2010	143.725	128.49	15.24
2541-MW-04	7/14/2010	143.725	129.29	14.44
2541-MW-04	9/23/2010	143.725	128.42	15.31
2541-MW-04	10/15/2010	143.725	123.55	20.18
2541-MW-05	10/25/2003	143.41	123.05	20.36
2541-MW-05	4/8/2004	143.41	123.08	20.33
2541-MW-05	5/22/2004	143.41	126.65	16.76
2541-MW-05	10/1/2009	143.41	127.5	15.91
2541-MW-05	7/10/2010	143.41	128.58	14.83
2541-MW-05	7/14/2010	143.41	129.43	13.98
2541-MW-05	9/27/2010	143.41	128.42	14.99
2541-MW-05	10/15/2010	143.41	123.62	19.79
SS016-MW001	10/10/2010	146.492	124.09	22.40
SS016-MW001	10/15/2010	146.492	122.64	23.85
SS016-MW001	10/17/2010	146.492	123.11	23.38
ST021-MW66	7/11/2010	144.783	128.32	16.46
ST021-MW66	7/21/2010	144.783	129.45	15.33
ST021-MW66	9/28/2010	144.783	127.52	17.26
ST021-MW66	10/15/2010	144.783	118.97	25.81
ST021-MW67	7/11/2010	145.383	128.37	17.01
ST021-MW67	7/21/2010	145.383	129.5	15.88
ST021-MW67	9/27/2010	145.383	127.73	17.65
ST021-MW67	10/15/2010	145.383	123.89	21.49
ST021-MW68	7/11/2010	144.396	128.07	16.33
ST021-MW68	9/27/2010	144.396	127.56	16.84
ST021-MW68	10/16/2010	144.396	123.63	20.77
ST021-MW69	7/11/2010	143.929	128.1	15.83
ST021-MW69	9/27/2010	143.929	126.78	17.15
ST021-MW69	10/16/2010	143.929	122.9	21.03
ST021-MW71	7/11/2010	145.382	128.47	16.91
ST021-MW71	9/27/2010	145.382	127.76	17.62
ST021-MW71	10/16/2010	145.382	123.8	21.58
ST021-MW71	10/16/2010	145.382	122.9	22.48

TABLE B-1

Groundwater Levels

Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena Forward Operating Location, Alaska

LOCID	LOGDATE	ELEV	WL_ELEV	Depth (bgs)
ST021-MW72	7/11/2010	144.266	128.09	16.18
ST021-MW72	7/21/2010	144.266	129.21	15.06
ST021-MW72	9/28/2010	144.266	127.32	16.95
ST021-MW72	10/15/2010	144.266	123.71	20.56

Notes:

bgs = below ground surface
 ELEV = elevation
 LOCID = location identification
 LOGDATE = log date
 WL ELEV = water level elevation

TABLE B-2

Sites 14/17 Comparison of Historical Sample Results to Toxicity Characteristic Levels
 Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena
 Forward Operating Location, Alaska

Analyte Name	Toxicity Characteristic Level ^a (mg/L)	Toxicity Characteristic Level x 20 (mg/kg)	Maximum Detection Results (mg/kg)	Location of Maximum Detection
Metals				
Arsenic	5	100	6.1	10-SS-05 (8/30/1992)
Barium	100	2,000	340	10-SS-05 (8/30/1992)
Cadmium	1	20	1.4	10-SS-05 (8/30/1992)
Chromium	5	100	39	10-SS-05 (8/30/1992)
Lead	5	100	45	10-SS-05 (8/30/1992)
Mercury	0.2	4	0.14	10-SS-05 (8/30/1992)
Selenium	1	20	Not detected	Not applicable
Silver	5	100	Not detected	Not applicable
PCB/Pesticides				
Chlordane	0.03	0.6	Not detected	Not applicable
Endrin	0.02	0.4	Not detected	Not applicable
Heptachlor	0.008	0.16	Not detected	Not applicable
Heptachlor Epoxide	0.008	0.16	Not detected	Not applicable
Methoxychlor	10	200	Not detected	Not applicable
Toxaphene	0.5	10	Not detected	Not applicable
SVOCs				
2,4,5-Trichlorophenol	400	8,000	Not detected	Not applicable
2,4,6-Trichlorophenol	2	40	Not detected	Not applicable
2,4-Dinitrotoluene	0.13	2.6	Not detected	Not applicable
Hexachlorobenzene	0.13	2.6	Not detected	Not applicable
Hexachloroethane	3	60	Not detected	Not applicable
Nitrobenzene	2	40	Not detected	Not applicable
Pentachlorophenol	100	2,000	Not detected	Not applicable
VOCs				
1,1-Dichloroethene	0.7	14	Not detected	Not applicable
1,2-Dichloroethane	0.5	10	Not detected	Not applicable
1,4-Dichlorobenzene	7.5	150	0.28 J	ST014-MC582
2-Butanone (MEK)	200	4,000	0.31 B	ST021-MC563
Benzene	0.5	10	2	SS017-MC566

TABLE B-2

Sites 14/17 Comparison of Historical Sample Results to Toxicity Characteristic Levels
 Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena
 Forward Operating Location, Alaska

Analyte Name	Toxicity Characteristic Level ^a (mg/L)	Toxicity Characteristic Level x 20 (mg/kg)	Maximum Detection Results (mg/kg)	Location of Maximum Detection
Carbon Tetrachloride	0.5	10	0.1 J	TFS-MC150
Chlorobenzene	100	2,000	Not detected	Not applicable
Chloroform	6	120	Not detected	Not applicable
Hexachlorobutadiene	0.5	10	Not detected	Not applicable
Tetrachloroethene (PCE)	0.7	14	0.56 J	ST021-MC563
Trichloroethene (TCE)	0.5	10	0.17 S	B1558_GP002
Vinyl Chloride	0.2	4	Not detected	Not applicable

^aFrom 40 Code of Federal Regulations 261.24 – Toxicity Characteristic

Abbreviations:

- B = The analyte was detected in the sample at a concentration less than or equal to five times (ten times for common laboratory contaminants) the blank concentration.
- J = The analyte was positively identified, and the quantitation is an estimation because of discrepancies in meeting certain analyte-specific quality control criteria. Or the analyte was positively identified, but the associated concentration is estimated above the method detection limit and below the limit of quantification.
- S = The analyte was positively identified; however, results should be used for screening purposes only.

Notes:

- bgs = below ground surface
 mg/kg = milligram per kilogram
 mg/L = milligrams per liter
 PCB = polychlorinated biphenyls
 SVOC = semivolatile organic compound
 VOC = volatile organic compound

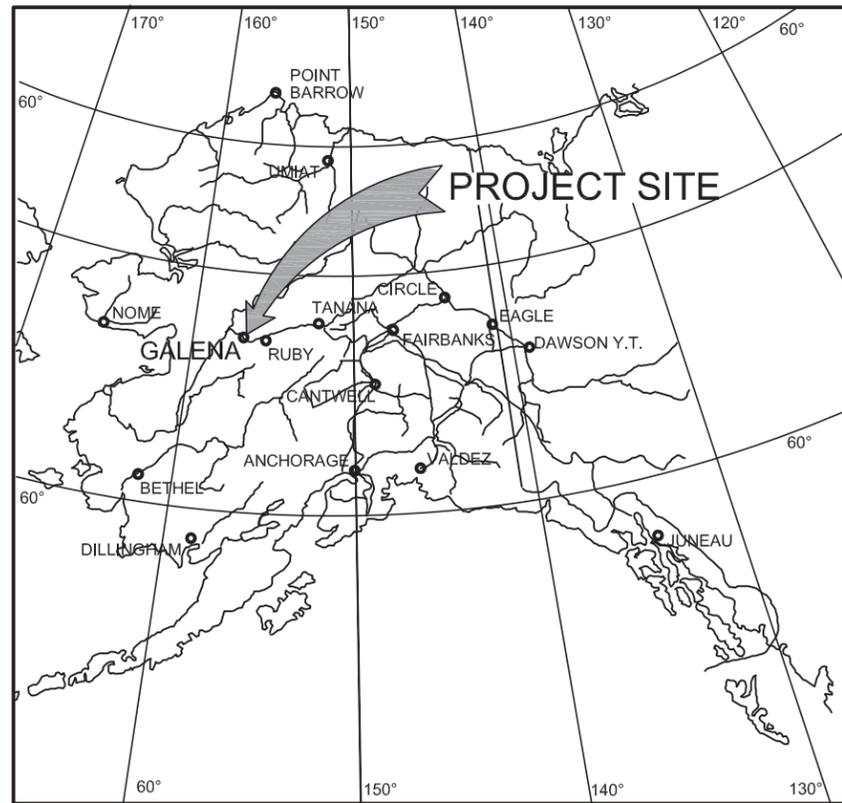
Appendix C
IRA Design Drawings

AIR FORCE CENTER FOR ENGINEERING AND THE ENVIRONMENT FORMER GALENA FORWARD OPERATING LOCATION (FOL)

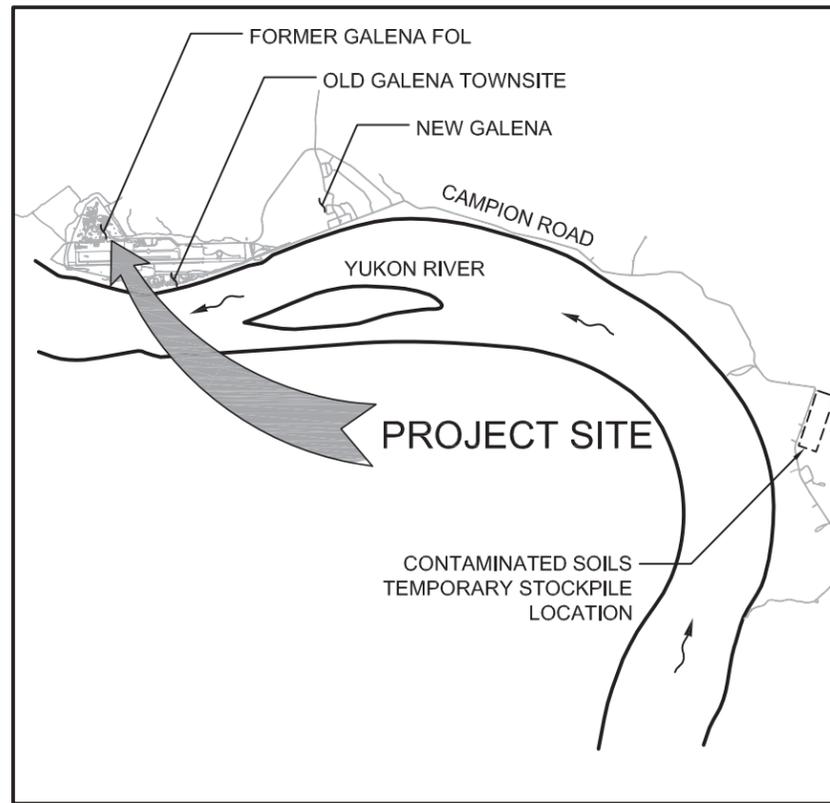
TASK ORDER 259 INTERIM REMOVAL ACTION SITES SS005 AND AST 1569

TYPE OF CONSTRUCTION

DEMOLITION OF STRUCTURES, OBSTRUCTIONS AND UTILITIES, EXCAVATION AND TRANSPORT OF CONTAMINATED SOILS, TEMPORARY STOCKPILE CONSTRUCTION, EROSION AND SEDIMENT CONTROLS AND IMPORT OF BACKFILL



VICINITY MAP
NOT TO SCALE



LOCATION MAP
NOT TO SCALE



INDEX OF DRAWINGS		
SHEET NUMBER	DRAWING NUMBER	DRAWING TITLE
		<u>GENERAL</u>
1	G-1	TITLE SHEET / VICINITY MAP / LOCATION MAP / INDEX OF DRAWINGS
2	G-2	LEGEND AND ABBREVIATIONS
3	G-3	CONSTRUCTION SPECIFICATIONS
4	G-4	CONSTRUCTION SPECIFICATIONS
		<u>CIVIL</u>
5	C-1	HAUL ROUTES & SURVEY CONTROL
6	C-2	DEMOLITION PLAN - SITE SS005
7	C-3	SITE PLAN - SITE SS005 & AST 1569
8	C-4	TEMPORARY STOCKPILE PLAN
9	C-5	EROSION AND SEDIMENT CONTROL PLAN (ESCP)
10	C-6	TRAFFIC CONTROL AT HAUL ROUTE WASHOUT AREA'S

CH2MHILL

EXCAVATION AT SITE SS005 & AST 1569
TITLE SHEET / VICINITY MAP
LOCATION MAP / INDEX OF DRAWINGS

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	JUNE 2011
PROJ	408222
DWG	G-1
SHEET	1

NO.	DATE	REVISION	CHK	DR	BY	APVD
1	6-28-11	TRAFFIC CONTROL SIGNS AND HAUL ROUTE CONTROL	J. TAYLOR	J. TAYLOR	J. TRACY	R. THOMPSON

STANDARD ABBREVIATIONS

@	AT	P&P	PLAN AND PROFILE
AC	ASPHALT CONCRETE	PC	POINT OF CURVATURE
APPROX	APPROXIMATE	PCC	PORTLAND CEMENT CONCRETE
BLDG	BUILDING	PE	POLYETHYLENE
BM	BENCHMARK	PERF	PERFORATED
BOT	BOTTOM	PI	POINT OF INTERSECTION
COR	CONTRACTING OFFICER'S REPRESENTATIVE	PL	PROPERTY LINE
CL	CENTERLINE	POB	POINT OF BEGINNING
CB	CATCH BASIN	POE	POINT OF ENDING
CC	CENTER OF CURVE	POL	PETROLEUM OIL LINE
CF	CUBIC FOOT(FEET)	PP	POWER POLE
CMP	CORRUGATED METAL PIPE	PT	POINT OF TANGENCY
CO	CLEANOUT	PVC	POLYVINYL CHLORIDE
CONC	CONCRETE	R	RADIUS
CONT	CONTINUED, CONTINUOUS	REQD	REQUIRED
COR	CONTRACTING OFFICER'S REPRESENTATIVE	RT	RIGHT
CPEP	CORRUGATED POLYETHYLENE PIPE	S	SOUTH
CTR	CENTER POINT	SC	SURVEY CONTROL MONUMENT
CY	CUBIC YARDS	SCHD	SCHEDULE
DI	DUCTILE IRON	SD	STORM DRAIN
DIA	DIAMETER	SDR	STANDARD DIMENSION RATIO
DIM	DIMENSION	SI	SYSTEM INTERNATIONAL (METRIC UNITS)
DRO	DIESEL RANGE ORGANIC	SST	STAINLESS STEEL
DWG	DRAWING	SWPPP	STORM WATER POLLUTION PREVENTION PLAN
E	EAST	TOPO	TOPOGRAPHY
EA / EW	EACH / EACH WAY	TYP	TYPICAL
EG	EXISTING GROUND	UPG	UNDERGROUND POWER
EL	ELEVATION	VERT	VERTICAL
ELEV	ELEVATION	W	WEST
EOP	EDGE OF PAVEMENT	W/	WITH
ESCP	EROSION AND SEDIMENT CONTROL PLAN	W/OUT	WITHOUT
EXST	EXISTING	STA	STATION
FG	FINISH GRADE	STD	STANDARD
FT	FOOT (FEET)	STL	STEEL
FL	FLOWLINE		
GRO	GASOLINE RANGE ORGANIC		
HDPE	HIGH DENSITY POLYETHYLENE		
HMA	HOT-MIX ASPHALT		
HORIZ	HORIZONTAL		
HT	HEIGHT		
ID	INSIDE DIAMETER		
IE	INVERT ELEVATION		
IM	IMPERIAL UNITS		
L	LENGTH OF CURVE		
LB	POUND		
LF	LINEAR FEET,		
L.S.	LAND SURVEYOR		
MAX	MAXIMUM		
MUTCD	MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES		
MFR	MANUFACTURER, MANUFACTURED		
MG/KG	MILLIGRAMS/KILOGRAM		
MH	MANHOLE		
MIN	MINIMUM		
MJ	MECHANICAL JOINT		
MM	MILLIMETER		
N	NORTH		
N/A	NOT APPLICABLE		
NIC	NOT IN CONTRACT		
NO.	NUMBER		
NTS	NOT TO SCALE		
N/S	NORTH AND SOUTH		
OC	ON CENTER		
OD	OUTSIDE DIAMETER		
%	PERCENT		

CIVIL LEGEND

EXISTING	THIS CONTRACT	EXISTING	THIS CONTRACT	
				SPOT ELEVATION
				CONTOUR LINE
				EMBANKMENT AND SLOPE
				DRAINAGeway OR DITCH
				CATCH BASIN OR INLET
				TRENCH DRAIN
				SIGN
				MANHOLE
				BENCH MARK
				SURVEY CONTROL POINT OR POINT OF INTERSECTION
				BRUSH/TREE LINE
				TREE
				PROPERTY LINE
				CENTER LINE, BUILDING, ROAD, ETC.
				STAGING OR WORK AREA LIMITS
				STRUCTURE, BUILDING OR FACILITY LOCATION POINT - COORDINATES
				BORING LOCATION AND NUMBER
				MONITORING WELL AND NUMBER
				DOUBLE SWING GATE
				SLIDING GATE
				GUARD RAIL
				CHAIN LINK FENCE
				ARCHITECTURAL FENCE
				WIRE FENCE
				STRUCTURE, BUILDING / FACILITY
				ASPHALT CONCRETE PAVEMENT
				GRAVEL SURFACING
				CONCRETE PAVEMENT
				CURB
				CURB AND GUTTER
				SINGLE SWING GATE
				CULVERT
				ROAD CLOSURE BARRICADE
				PREVIOUSLY INSTALLED BMP

GENERAL NOTES

1. THE LOCATIONS OF EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES SHOULD BE CONSIDERED APPROXIMATE AND NOT NECESSARILY COMPLETE. VERIFY ACCURACY OF ALL UTILITY LOCATIONS AND FURTHER DISCOVER ANY OTHER UTILITIES NOT SHOWN WHICH MAY BE IMPACTED BY CONSTRUCTION. OBTAIN THE REQUIRED PERMITS THAT VERIFY THE TRUE AND CORRECT LOCATION PRIOR TO CONSTRUCTION SO AS TO AVOID DAMAGE OR DISTURBANCE. AVOID AND PROTECT ALL UTILITIES IN USE DURING CONSTRUCTION.
2. IN GENERAL, EXISTING STRUCTURES AND FACILITIES ARE NOTED AS "EXISTING" AND ARE SHOWN IN LIGHT LINE WEIGHTS, DASHED LINE TYPE OR AS SCREENED BACKGROUND. NEW FEATURES ARE SHOWN IN HEAVY LINE WEIGHTS.
3. MANY OF THE SYMBOLS ON THIS LEGEND ARE USED ONLY WHERE THEY PROVIDE CLARITY AND ARE NOT NECESSARILY USED AT ALL APPLICATIONS. SOME DRAWINGS IN THE CONTRACT DOCUMENTS HAVE ADDITIONAL LEGENDS APPLICABLE TO THOSE SPECIFIC DRAWINGS.
4. TYPICAL DETAILS APPLY TO ALL CONDITIONS WHERE MATERIALS INDICATED CONNECT AND THAT ARE SIMILAR UNLESS DETAILED OTHERWISE.
5. CONTRACTOR TO PROVIDE 14 CALENDAR DAY NOTICE TO THE ENGINEER OF ANY INTERRUPTION TO EXISTING UTILITIES, TRAFFIC PATTERNS OR EXISTING SERVICES.
6. PROVIDE 72 HOUR NOTICE TO AIRMEN FOR ALL WORK WITHIN 400 FT OF TAXI/RUNWAY.

EXISTING UTILITIES LEGEND

	E-OVH	OVERHEAD ELECTRICAL LINES
	E-BUR	BURIED ELECTRICAL LINES
	POL	PETROLEUM, OIL, LUBRICANT LINE
	S	SANITARY SEWER
	S	STORM DRAIN
	UT	BURIED COMMUNICATION LINE
	FO	BURIED FIBER OPTICS LINE
	W	BURIED WATER/STEAM LINE
		CONTAMINATED SITE BOUNDARY



NO.	DATE	REVISION	BY	APVD
			J. TAYLOR	J. TRACY
			J. TAYLOR	R. THOMPSON

NO.	DATE	REVISION	BY	APVD
			J. TAYLOR	J. TRACY
			J. TAYLOR	R. THOMPSON

CH2MHILL

EXCAVATION AT SITE SS005 & AST 1569

CIVIL
LEGEND AND ABBREVIATIONS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
DATE JUNE 2011
PROJ 408222
DWG G-2
SHEET 2

REMOVAL OF STRUCTURES AND OBSTRUCTIONS

DESCRIPTION: REMOVE AND DISPOSE OR SALVAGE ALL FENCES, STRUCTURES, OLD PAVEMENTS, ABANDONED UTILITIES AND ANY OTHER OBSTRUCTIONS WHICH ARE NOT DESIGNATED OR PERMITTED TO REMAIN, EXCEPT FOR THE OBSTRUCTIONS TO BE REMOVED AND DISPOSED OF UNDER OTHER ITEMS IN THE CONTRACT. BACKFILL THE RESULTING TRENCHES, HOLES AND PITS. WHEN THE BID DOES NOT INCLUDE PAY ITEMS FOR REMOVAL OF STRUCTURES AND OBSTRUCTIONS AS SET OUT IN THIS SECTION, PERFORM SUCH WORK UNDER SECTION AS SPECIFIED. REMOVE AND RESET FENCES AND POSTS AS SHOWN ON THE PLANS. PRESERVE FROM INJURY AND DEFAACEMENT ALL VEGETATION AND OBJECTS NOT SCHEDULED TO BE REMOVED.

CONSTRUCTION REQUIREMENTS: RAZE, REMOVE, AND DISPOSE OF, OR SALVAGE, ALL BUILDING FOUNDATIONS, STRUCTURES, FENCES, AND OTHER OBSTRUCTIONS, ANY PORTIONS OF WHICH ARE WITHIN CONSTRUCTION LIMITS, EXCEPT UTILITIES AND THOSE FOR WHICH OTHER PROVISIONS HAVE BEEN MADE FOR REMOVAL. FILL BASEMENTS, OR CAVITIES LEFT BY STRUCTURE REMOVAL, TO THE LEVEL OF THE SURROUNDING GROUND AND, IF WITHIN THE PRISM OF CONSTRUCTION, COMPACT BACKFILL AS SPECIFIED UNDER OTHER SECTIONS.

STOCKPILE ALL MATERIALS WHICH ARE DESIGNATED FOR USE ON THE PROJECT AT APPROVED LOCATIONS.

DISPOSAL: NON-COMBUSTIBLE DEBRIS OR MATERIALS MAY BE:

- DISPOSED AT THE CITY OF GALENA ACTIVE LANDFILL. COORDINATE WITH THE CITY TO OBTAIN ALL PERMITS AND RESTRICTIONS ASSOCIATED WITH USE OF THE LANDFILL.
- DISPOSED OF OUTSIDE THE CONSTRUCTION LIMITS, PROVIDED THAT BEFORE DUMPING SUCH MATERIALS OR DEBRIS ON PRIVATE OR PUBLIC LANDS, OBTAIN FROM THE OWNER OF SUCH LAND WRITTEN PERMISSION FOR SUCH DUMPING AND A WAIVER OF ALL CLAIMS AGAINST CH2M HILL FOR ANY DAMAGE TO SUCH LAND WHICH MAY RESULT, TOGETHER WITH ALL PERMITS REQUIRED BY LAW FOR SUCH DUMPING. FURNISH A COPY OF SUCH PERMISSION, WAIVER OF CLAIMS, AND PERMITS TO THE ENGINEER BEFORE COMMENCING WORK. GRADE WASTE AREAS TO DRAIN.

WHERE THE CONTRACT CALLS FOR REMOVAL OF PIPE THE REMOVED PIPE BECOMES THE PROPERTY OF THE CONTRACTOR. CAP LINES AT THE DEMOLITION POINT SHOWN ON THE PLANS AND ABANDON THE PIPE TO REMAIN IN PLACE.

METHOD OF MEASUREMENT: CONTRACT SCOPE OF WORK AND THE FOLLOWING:

- LINEAR FOOT - LENGTH BEFORE REMOVAL

BASIS OF PAYMENT: PAYMENT INCLUDES SALVAGE OF MATERIALS REMOVED, THEIR CUSTODY, PRESERVATION, TEMPORARY STORAGE WITHIN THE CONSTRUCTION LIMITS AND DISPOSAL AS PROVIDED.

BACKFILL

DESCRIPTION: IMPORT, PLACE, COMPACT AND GRADE CLEAN BORROW MATERIALS IN THE COMPLETED EXCAVATIONS.

CONSTRUCTION REQUIREMENTS: DO NOT PLACE ROCKS LARGER THEN 12 INCHES, BROKEN CONCRETE OR OTHER SOLID MATERIALS IN EMBANKMENT AREAS. WHEN PERMANENTLY FROZEN SOILS ARE ENCOUNTERED, PLACE BACKFILL OR EMBANKMENT MATERIALS IN A TIMELY MANNER, AS DIRECTED, TO MINIMIZE DEGRADATION OF THE FOUNDATION MATERIAL. DO NOT PLACE EMBANKMENT OVER SEASONALLY FROZEN GROUND UNLESS AUTHORIZED IN WRITING.

WHEN EXCAVATION IS PERFORMED WHEN FREEZING WEATHER IS IMMINENT, PLACE THE SPECIFIED BACKFILL PROMPTLY, FOLLOWING THE EXCAVATION WORK, AT LEAST UP TO A LEVEL WHICH WILL ALLOW THE SURFACE TO ADEQUATELY DRAIN. MAKE ARRANGEMENTS FOR THE TIMELY AVAILABILITY OF SUCH EMBANKMENT OR BACKFILL MATERIALS PRIOR TO COMMENCEMENT OF THE STRIPPING OR EXCAVATION OPERATIONS, WHEN REQUIRED.

PLACE EMBANKMENT OF EARTH MATERIALS IN HORIZONTAL LAYERS NOT TO EXCEED 18 INCHES (UNCOMPACTED) FOR THE FULL WIDTH OF THE EMBANKMENT, EXCEPT AS REQUIRED FOR TRAFFIC, AND COMPACT AS SPECIFIED BEFORE THE NEXT LAYER IS PLACED. USE SPREADING EQUIPMENT ON EACH LIFT TO OBTAIN UNIFORM THICKNESS PRIOR TO COMPACTING. MAINTAIN UNIFORM DENSITY DURING COMPACTION. ROUTE COMPACTION EQUIPMENT UNIFORMLY OVER THE ENTIRE SURFACE OF EACH LAYER.

BORROW: APPROVED MATERIAL REQUIRED FOR EMBANKMENTS OR FOR OTHER PORTIONS OF THE WORK, AND OBTAINED FROM SOURCES OUTSIDE THE CONSTRUCTION LIMITS FOR THE PROJECT

MATERIALS: USE CLEAN BORROW FROM A PERMITTED, EXISTING BORROW SOURCE, THAT CONFORMS TO THE FOLLOWING:

CLEAN SAND, GRAVEL, SMALL ROCK, OR A COMBINATION THEREOF, CONTAINING NO MUCK, PEAT, SOD, FROZEN MATERIAL OR OTHER DELETERIOUS MATTER, AND IS COMPACTABLE UNDER THE COMPACTION PROVISIONS. SUBMIT A PLAN DETAILING THE LOCATION OF THE EXISTING, PERMITTED BORROW SOURCE, ALONG WITH A PROPOSED HAUL ROUTE AND TRAFFIC MAINTENANCE PLAN FOR APPROVAL PRIOR TO BEGINNING BORROW SOURCE OPERATIONS.

COMPACTION: COMPACT BY MECHANICAL TAMPING OF THE BACKFILL, AND/OR ROUTING CONSTRUCTION EQUIPMENT AND/OR ROLLERS UNIFORMLY OVER THE ENTIRE SURFACE OF EACH LAYER BEFORE THE NEXT LAYER IS PLACED. COMPACT UNTIL EMBANKMENT DOES NOT RUT UNDER THE LOADED HAULING OR TAMPING EQUIPMENT.

KEEP DUMPING AND COMPACTING AREAS SEPARATE. DO NOT COVER ANY LIFT BY ANOTHER UNTIL THE REQUIRED COMPACTION HAS BEEN COMPLETED.

METHOD OF MEASUREMENT: CONTRACT SCOPE OF WORK

BASIS OF PAYMENT: PLAN SUBMITTALS, PURCHASING AND LOADING BORROW, TRANSPORTING, COMPACTING AND FINISH GRADING ARE SUBSIDIARY TO EMBANKMENT CONSTRUCTION.

EXCAVATION

DESCRIPTION: EXCAVATE, HAUL, STOCKPILE AS BACKFILL, STOCKPILE CONTAMINATED SOIL, OR DISPOSE OF, AS DIRECTED, SPECIFIED MATERIALS NECESSARY TO CONSTRUCT THE PROJECT. CONFORM TO THE LINES, GRADES, DEPTHS AND TYPICAL CROSS SECTIONS SHOWN ON THE PLANS OR AS DIRECTED.

UNCLASSIFIED EXCAVATION: ALL MATERIALS OF WHATEVER CHARACTER ENCOUNTERED IN THE WORK. THE MAJORITY OF UNCLASSIFIED MATERIALS FOR THIS CONTRACT ARE KNOWN TO BE CONTAMINATED WITH GASOLINE AND DIESEL RANGE ORGANICS, AS SHOWN ON THE PLANS. COMPLY WITH THE HEALTH AND SAFETY REQUIREMENTS SET FORTH IN THE CONTRACT. MATERIALS NOT CONTAMINATED WILL BE STOCKPILED ONSITE AND CONSIDERED SUITABLE FOR USE AS BACKFILL. CH2M HILL WILL DETERMINE IF SOILS ARE CONTAMINATED AND DIRECT THE CONTRACTOR ACCORDINGLY.

CONSTRUCTION REQUIREMENTS: PERFORM ALL NECESSARY DEMOLITION AND CLEARING AND GRUBBING PRIOR TO BEGINNING EXCAVATION, GRADING, AND BACKFILLING OPERATIONS IN ANY AREA.

EXCAVATION INSPECTING AND TESTING: ENTERING THE EXCAVATION IS NOT ANTICIPATED. IF PERSONS WILL BE IN OR AROUND AN EXCAVATION, A COMPETENT PERSON SHALL INSPECT THE EXCAVATION, THE ADJACENT AREAS, AND PROTECTIVE SYSTEMS DAILY, AS NEEDED THROUGHOUT THE WORK SHIFTS, AND AFTER EVERY RAINSTORM OR OTHER HAZARD-INCREASING OCCURRENCE.

A COMPETENT PERSON MEANS A PERSON WHO HAS COMPLETED THE APPROPRIATE OSHA TRAINING AND HAS CURRENT CERTIFICATION. SUBMIT THE NAME OF THE COMPETENT PERSON, PROOF OF CERTIFICATION, AND THE DATE AND LOCATION OF THE RELEVANT TRAINING PRIOR TO BEGINNING EXCAVATION.

PROTECTIVE SYSTEMS: THE SIDES OF ALL EXCAVATIONS IN WHICH EMPLOYEES ARE EXPOSED TO DANGER FROM MOVING GROUND SHALL BE GUARDED BY A SUPPORT SYSTEM, SLOPING OR BENCHING OF THE GROUND, OR OTHER EQUIVALENT MEANS.

SLOPING OR BENCHING OF THE GROUND SHALL BE IN ACCORDANCE WITH ONE OF THE SYSTEMS OUTLINED BELOW:

- FOR EXCAVATIONS LESS THEN 20 FT IN HEIGHT, THE MAXIMUM SLOPE SHALL NOT EXCEED 34° AS MEASURED FROM THE HORIZONTAL (1.5H : 1V) . ADJUST DEPTH AND/OR LIMITS OF EXCAVATION TO PROVIDE FLATTER SLOPES IF REQUIRED BY SITE CONDITIONS.
- SLOPING OR BENCHING AS DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER.

MOTOR VEHICLE PRECAUTIONS: WHERE MOTOR VEHICLES ARE ALLOWED ADJACENT TO AN EXCAVATION, STOP LOGS OR BARRICADES SHALL BE USED.

PERIMETER PROTECTION AND SAFE ACCESS: PROVIDE WARNING BARRICADES OR HIGH VISIBILITY FLAGGING PLACED AT A DISTANCE NOT CLOSER THEN SIX FEET FROM THE EDGE OF EXCAVATION.

WHERE PERSONNEL ARE REQUIRED TO ENTER EXCAVATIONS OVER 4 FT IN DEPTH, SUFFICIENT STAIRS, RAMPS, OR LADDERS SHALL BE PROVIDED TO REQUIRE NO MORE THAN 25 FT OF LATERAL TRAVEL. PROVIDE AT LEAST TWO MEANS OF EXIT.

PROTECTION FROM WATER: KEEP EXCAVATION AND EMBANKMENT AREAS FREE DRAINING AT ALL TIMES AS THE WORK PROGRESSES. DIVERSION DITCHES, DIKES OR OTHER MEANS SHALL BE USED TO PREVENT SURFACE WATER FROM ENTERING THE EXCAVATION. DO NOT WORK IN OR AROUND ANY EXCAVATION THAT CONTAINS STANDING WATER. GRADE OR TRENCH, AS REQUIRED, WITHIN THE EXCAVATION TO DRAIN WEEP OR STORM WATER TO FREE DRAINING SOIL LAYERS ENCOUNTERED WITHIN THE EXCAVATION. WEEP AND/OR STORMWATER MAY BE PUMPED FROM ONE EXCAVATION TO AN ADJACENT, FREE DRAINING EXCAVATION IF REQUIRED. DO NOT PUMP AND DISCHARGE WATER OUT OF AN EXCAVATION WITHOUT WRITTEN APPROVAL FROM THE ENGINEER.

LIMITS OF EXCAVATION: EXCAVATE CONTAMINATED SOILS AND EMBANK CLEAN BACKFILL MATERIAL AS DIRECTED. EXCEPT FOR THE AT GRADE EXCAVATION LIMITS, THE EXCAVATION LIMITS AND DEPTHS SHOWN ON THE PLANS ARE APPROXIMATE. DO NOT EXCAVATE SOILS OUTBOARD OF THE AT GRADE EXCAVATION LIMITS WITHOUT WRITTEN AUTHORIZATION FROM CH2M HILL. PREVENT DISTURBING MATERIAL AND VEGETATION OUTSIDE OF THE SLOPE LIMITS.

DISPOSAL: DISPOSE OF CONTAMINATED SOILS AT THE STOCKPILE LOCATION SHOWN ON THE PLANS. PLACE THE MATERIAL ON THE CONSTRUCTED LINER SYSTEM, TO THE HEIGHTS AND DIMENSIONS SHOWN. SHAPE THE STOCKPILE TO FINISHED DIMENSIONS DAILY AND PLACE THE STOCKPILE TOPCOVER AS SOON AS PORTIONS OF THE STOCKPILE ARE CONSTRUCTED TO FINISH GRADE.

METHOD OF MEASUREMENT: CONTRACT SCOPE OF WORK

BASIS OF PAYMENT: THE FOLLOWING WORK IS SUBSIDIARY TO TO EXCAVATION:

BARRICADES, TEMPORARY ONSITE STOCKPILE OF MATERIAL SUITABLE FOR USE AS BACKFILL, TRANSPORTING CONTAMINATED SOILS TO THE STOCKPILE LOCATION, PLACING SOILS IN THE STOCKPILE, SHAPING THE PILE TO THE DIMENSIONS SHOWN AND PLACING AND SECURING THE STOCKPILE TOPCOVER.



NO.	DATE	DR	REVISION	CHK	BY
		J. TAYLOR	J. TAYLOR	J. TRACY	R. THOMPSON

NO.	DATE	DR	REVISION	CHK	BY
		J. TAYLOR	J. TAYLOR	J. TRACY	R. THOMPSON

CH2MHILL
EXCAVATION AT SITE SS005 & AST 1569
CIVIL
CONSTRUCTION SPECIFICATIONS

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	JUNE 2011
PROJ	408222
DWG	G-3
SHEET	3

STOCKPILE BOTTOM LINER CONSTRUCTION

DESCRIPTION: CONSTRUCT A TEMPORARY BOTTOM LINER FOR STOCKPILING CONTAMINATED SOILS. USE OWNER FURNISHED GEOTEXTILES AND BOTTOM LINER MATERIAL. CONSTRUCT LINER ON AN EXISTING PREPARED SURFACE AT THE LOCATION SHOWN ON THE PLANS.

CONSTRUCTION REQUIREMENTS: SURFACE PREPARATION. THE EXISTING SURFACE HAS BEEN PREPARED BY REMOVAL OF STUMPS, BRUSH, BOULDERS, AND SHARP OBJECTS AND ROUGH GRADED. FILL ANY HOLES AND LARGE RUTS WITH GRAVEL, SAND OR OTHER MATERIAL AS APPROVED. GRADE SURFACE, AS REQUIRED, TO BE SMOOTH, UNIFORM AND FREE DRAINING.

GEOTEXTILE AND BOTTOM LINER PLACEMENT: UNROLL BOTTOM LINER DIRECTLY ONTO THE PREPARED SURFACE. STRETCH LINER TO REMOVE ANY CREASES OR WRINKLES. DO NOT EXPOSE LINER TO THE ELEMENTS FOR LONGER THAN 5 DAYS AFTER REMOVAL OF PROTECTIVE COVERING. LAY LINER PARALLEL TO ROADWAY CENTERLINE. STRAIGHTEN THE LINER AND OVERLAP BUTT ENDS. ENSURE THAT THE LAP TRENDS DOWN HILL. OVERLAPPED SECTIONS MUST OVERLAP BY 5 FEET.

PLACE THE GEOTEXTILE ON TOP OF THE BOTTOM LINER ACCORDING TO THE SAME INSTALLATION REQUIREMENTS. OVERLAP GEOTEXTILE BUTT ENDS BY 3 FEET.

MATERIAL PLACING AND SPREADING: DURING PLACING AND SPREADING, MAINTAIN A MINIMUM DEPTH OF 12 INCHES OF COVER MATERIAL AT ALL TIMES BETWEEN THE FABRIC AND THE WHEELS OR TRACKS OF THE CONSTRUCTION EQUIPMENT. SPREAD THE MATERIAL IN THE DIRECTION OF THE FABRIC OVERLAP. MAINTAIN PROPER OVERLAP AND FABRIC CONTINUITY. ON WEAK SUBGRADES SPREAD THE COVER MATERIAL SIMULTANEOUSLY WITH DUMPING TO MINIMIZE THE POTENTIAL OF A LOCALIZED SUBGRADE FAILURE. DO NOT ALLOW CONSTRUCTION EQUIPMENT TO MAKE SUDDEN STOPS, STARTS, OR TURNS ON THE COVER MATERIAL.

GEOTEXTILE AND LINER REPAIR: OVERLAY TORN AREA WITH GEOTEXTILE OR LINER WITH A MINIMUM 3 FOOT OVERLAP AROUND THE EDGES OF THE TORN AREA. ENSURE THAT THE PATCH REMAINS IN PLACE WHEN MATERIAL IS PLACED OVER THE AFFECTED AREA.

METHOD OF MEASUREMENT: CONTRACT SCOPE OF WORK

BASIS OF PAYMENT: ANY WORK ASSOCIATED WITH SUBGRADE PREPARATION AND GRADING, GEOTEXTILE AND LINER PATCHING AND WRAPPING AND STAKING OF LINER OVER THE COMPLETED PILE IS INCIDENTAL TO STOCKPILE LINER BOTTOM CONSTRUCTION.

EROSION CONTROL AND SEDIMENT CONTROL

DESCRIPTION: PLAN, PROVIDE, INSPECT, AND MAINTAIN CONTROL OF EROSION, SEDIMENTATION, WATER POLLUTION, AND HAZARDOUS MATERIALS CONTAMINATION. COMPLY WITH THE STORMWATER POLLUTION PREVENTION PLAN PROVIDED IN THE CONTRACT.

CONSTRUCTION REQUIREMENTS: COMPLY WITH ALL REQUIREMENTS OF THE APPROVED STORMWATER PLAN AND ALL STATE AND FEDERAL REGULATIONS THAT PERTAIN TO THE HANDLING, STORAGE, CLEANUP, AND DISPOSAL OF PETROLEUM PRODUCTS OR OTHER HAZARDOUS SUBSTANCES. CONTAIN, CLEAN UP, AND DISPOSE OF ALL DISCHARGES OF PETROLEUM PRODUCTS AND/OR OTHER MATERIALS HAZARDOUS TO THE LAND, AIR, WATER, AND ORGANIC LIFE FORMS. PERFORM ALL FUELING OPERATIONS IN A SAFE AND ENVIRONMENTALLY RESPONSIBLE MANNER. COMPLY WITH THE REQUIREMENTS OF 18 AAC 75 AND AS 46, OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTROL. REPORT OIL SPILLS AS REQUIRED BY FEDERAL, STATE AND LOCAL LAW.

COMPLY WITH ALL REQUIREMENTS OF THE STORMWATER PERMIT, IMPLEMENT AND MAINTAIN ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLANS. MAINTAIN ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION.

PERFORM INSPECTIONS AND PREPARE INSPECTION REPORTS IN COMPLIANCE WITH THE PROJECT PLANS AND PERMITS.

STREET SWEEPING: KEEP FREE OF LOOSE MATERIAL ALL PAVED PORTIONS OF THE ROADWAY AND HAUL ROUTES OPEN TO THE PUBLIC, INCLUDING SECTIONS OF ROADWAY OFF THE PROJECT WHERE YOUR OPERATIONS HAVE DEPOSITED LOOSE MATERIAL. USE A BROOM TO EJECT THE MATERIAL OUTSIDE THE TRAVELED WAY. COLLECT AND DISPOSE OF ANY EJECTED MATERIAL.

WATERING FOR DUST CONTROL: FURNISH, HAUL, AND PLACE WATER FOR DUST CONTROL. PROVIDE ENOUGH WATER TO ELIMINATE VISIBLE AIRBORNE DUST, OR AS DIRECTED. USE WATER TRUCKS THAT CAN PROVIDE A LIGHT-WATER SPRAY TO CONTROL DUST. IF THE FLUSHING OPERATIONS CONTAMINATE OR FILL ADJACENT CATCH BASINS, CLEAN AND RESTORE THEM TO THEIR ORIGINAL CONDITION. THIS REQUIREMENT INCLUDES SECTIONS OF ROADWAY OFF THE PROJECT WHERE FLUSHING IS REQUIRED. THE ENGINEER WILL CONTROL WATER APPLICATION. IF YOU TAKE WATER FROM A LAKE, STREAM, OR OTHER NATURAL WATER BODY, FIRST OBTAIN A WATER REMOVAL PERMIT FROM THE ALASKA DEPARTMENT OF NATURAL RESOURCES. COMPLY WITH THE ALASKA DEPARTMENT OF FISH AND GAME SCREENING REQUIREMENTS FOR ALL WATER REMOVAL OPERATIONS. COORDINATE WITH THE CITY OF GALENA FOR USE OF CITY WATER.

CONTRACTOR TRACKING PAD AND ENTRANCE: CONSTRUCT CONTRACTOR TRACKING PADS AS SHOWN ON ESCP. REMOVE TRACKING PAD FROM SS005 AND AST 1569 UPON COMPLETION OF WORK. TRACKING PAD(S) INSTALLED AT THE TEMPORARY STOCKPILE ARE TO REMAIN IN PLACE. BRUSH HAUL TRUCK TIRES TO REMOVE SEDIMENT PRIOR TO LEAVING THE EXCAVATION AND STOCKPILE AREAS.

METHOD OF MEASUREMENT: CONTRACT SCOPE OF WORK

BASIS OF PAYMENT: ALL WATERING FOR DUST CONTROL AND OBTAINING ANY REQUIRED PERMITS, PROVISION AND INSTALLATION OF CULVERT AT STOCKPILE TRACKING PAD, CONSTRUCTION AND DEMOLITION AT COMPLETION OF TRACKING PADS, STOCKPILE DIVERSION BERMS AND MAINTENANCE OF DITCHES AND PREVIOUSLY INSTALLED BMP'S ARE INCIDENTAL TO THIS ITEM.

MAINTENANCE OF TRAFFIC

DESCRIPTION: PROTECT AND CONTROL TRAFFIC DURING THE CONTRACT. FURNISH, ERECT, MAINTAIN, REPLACE, CLEAN, MOVE AND REMOVE THE TRAFFIC CONTROL DEVICES REQUIRED TO ENSURE THE TRAVELING PUBLIC'S SAFETY. PERFORM ALL ADMINISTRATIVE RESPONSIBILITIES NECESSARY TO IMPLEMENT THIS WORK.

MAINTAIN ALL ROADWAYS AND PEDESTRIAN AND BICYCLE FACILITIES AFFECTED BY THE WORK IN A SMOOTH AND PASSABLE CONDITION. MAINTAIN EXISTING TRAFFIC PATTERNS AT ALL TIMES DURING CONSTRUCTION.

ROADWAY CHARACTERISTICS DURING CONSTRUCTION: CONDUCT CONSTRUCTION TO PROVIDE A SMOOTH AND EVEN SURFACE THAT PUBLIC TRAFFIC CAN USE AT ALL TIMES. PROPERLY CROWN THE ROADBED SURFACE FOR DRAINAGE. PRIOR TO COMMENCING HAULING OPERATIONS, TAKE PHOTOGRAPHS OF THE EXISTING ROAD AT THE LOCATIONS SPECIFIED BY THE ENGINEER. TAKE ANY ADDITIONAL PHOTOGRAPHS REQUIRED TO DOCUMENT THE CONDITION OF THE ROAD PRIOR TO BEGINNING CONSTRUCTION. SUBMIT THE RECONSTRUCTION PHOTOGRAPHS PRIOR TO HAULING. TAKE PHOTOGRAPHS AT THE SAME LOCATIONS UPON COMPLETING CONSTRUCTION. SUBMIT THE POST HAULING PHOTOGRAPHS AS PART OF THE APPLICATION FOR FINAL PAYMENT.

GENERAL CONSTRUCTION REQUIREMENTS: KEEP THE WORK, AND PORTIONS OF THE PROJECT AFFECTED BY THE WORK, IN GOOD CONDITION TO ACCOMMODATE TRAFFIC SAFELY. PROVIDE AND MAINTAIN TRAFFIC CONTROL DEVICES AND SERVICES INSIDE AND OUTSIDE THE PROJECT LIMITS, DAY AND NIGHT, TO GUIDE TRAFFIC SAFELY.

UNLESS OTHERWISE PROVIDED IN THIS SECTION, KEEP ALL ROADWAYS, BUSINESS ACCESSES, AND PEDESTRIAN FACILITIES WITHIN AND ADJACENT TO THE PROJECT LIMITS OPEN TO TRAFFIC. OBTAIN THE ENGINEER'S APPROVAL BEFORE TEMPORARILY CLOSING RESIDENTIAL, COMMERCIAL, OR STREET APPROACHES IF REQUIRED. DO NOT RESTRICT ACCESS OF EMERGENCY VEHICLES. DO NOT REDIRECT OR STOP THE TRAVELING PUBLIC.

STOP YOUR EQUIPMENT AT ALL POINTS OF INTERSECTION WITH THE TRAVELING PUBLIC UNLESS AN APPROVED TCP SHOWS OTHERWISE.

PROVIDE AND MAINTAIN SAFE ROUTES FOR PEDESTRIANS AND BICYCLISTS THROUGH OR AROUND TRAFFIC CONTROL ZONES AT ALL TIMES, EXCEPT WHEN REGULATIONS PROHIBIT PEDESTRIANS OR BICYCLISTS.

PUBLIC NOTICE: MAKE SURE THE WORK SITE TRAFFIC SUPERVISOR GIVES NOTICES OF MAJOR CHANGES, DELAYS, LANE RESTRICTIONS, OR ROAD CLOSURES TO LOCAL OFFICIALS AND TRANSPORTATION ORGANIZATIONS, INCLUDING BUT NOT NECESSARILY LIMITED TO

- ALASKA STATE TROOPERS
- LOCAL FIRE DEPARTMENT
- LOCAL GOVERNMENT TRAFFIC ENGINEER
- SCHOOL AND TRANSIT AUTHORITIES
- LOCAL EMERGENCY MEDICAL SERVICES
- LOCAL MEDIA (NEWSPAPERS, RADIO, TELEVISION)
- U.S. POSTAL SERVICE

TEMPORARY CONSTRUCTION SIGNS: PROVIDE TEMPORARY CONSTRUCTION SIGNS AT THE LOCATIONS SHOWN ON THE PLANS. SIGNS SHOULD READ AS DESCRIBED ON SHEET C-6.

PORTABLE SIGN SUPPORTS: USE WIND-RESISTANT SIGN SUPPORTS WITH NO EXTERNAL BALLASTING. USE SIGN SUPPORTS THAT CAN VERTICALLY SUPPORT A 48 X 48 INCH TRAFFIC CONTROL SIGN AT THE HEIGHT ABOVE THE ADJACENT ROADWAY SURFACE REQUIRED BY THE ALASKA TRAFFIC MANUAL

METHOD OF MEASUREMENT: CONTRACT SCOPE OF WORK

BASIS OF PAYMENT: ALL GRADING WORK ASSOCIATED WITH MAINTAINING A SMOOTH AND EVEN SURFACE FOR THE PUBLICS USE IS INCIDENTAL TO THE MAINTENANCE OF TRAFFIC ITEM.

UTILITY CONDUIT

DESCRIPTION: REPLACE CONDUIT DEMOLISHED DURING SS005 EXCAVATION.

CONSTRUCTION REQUIREMENTS: PRIOR TO COMPLETING BACKFILL, REPLACE CONDUIT DEMOLISHED DURING SS005 EXCAVATION TO THE APPROXIMATE LINE AND DEPTH OF THE ORIGINAL CONDUIT, OR AS DIRECTED. SECURE JOINTS ACCORDING TO THE MANUFACTURERS INSTRUCTIONS. FACILITATE PULLING NEW WIRE BY ROUTING WIRE THROUGH THE CONDUIT AND SECURING TO THE DEMOLISHED ENDS OF ELECTRICAL WIRE REMAINING ON BOTH SIDES. PROTECT CONDUIT DURING REMAINING BACKFILLING OPERATIONS.

METHOD OF MEASUREMENT: CONTRACT SCOPE OF WORK

BASIS OF PAYMENT: ALL WORK REQUIRED FOR A COMPLETE INSTALLATION SHALL BE INCIDENTAL TO THIS ITEM.

CH2MHILL

EXCAVATION AT SITE SS005 & AST 1569

CIVIL
CONSTRUCTION SPECIFICATIONS

VERIFY SCALE

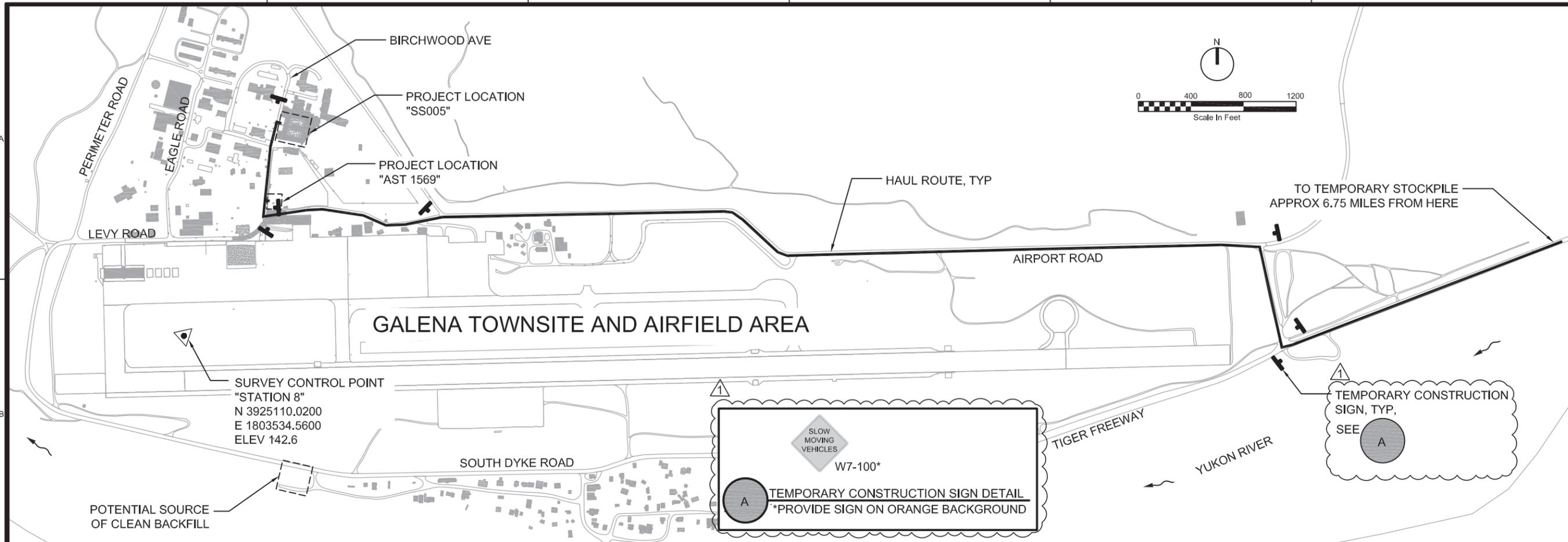
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DATE JUNE 2011

PROJ 408222

DWG G-4

SHEET 4

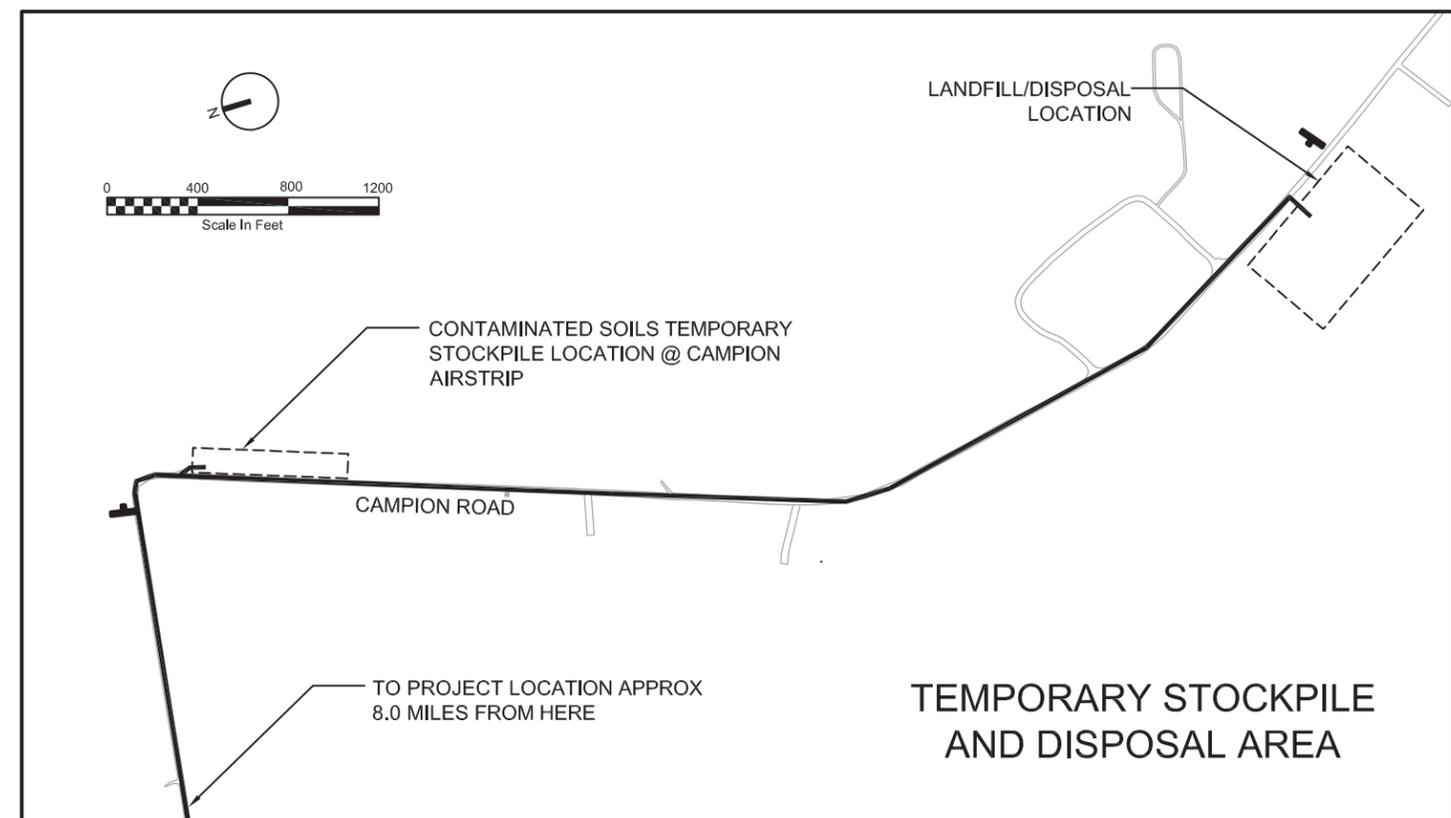


GENERAL NOTES

1. PROVIDE CLEAN BACKFILL FROM AN ESTABLISHED BORROW SOURCE THAT MEETS THE SPECIFICATIONS SHOWN ON SHEET G-3. BACKFILL MAY BE AVAILABLE FOR PURCHASE AT THE LOCATION SHOWN. SUBMIT A PLAN DETAILING BORROW SOURCE LOCATION(S) AND PROPOSED HAUL ROUTES FOR APPROVAL PRIOR TO BEGINNING EXCAVATION.
2. SUBMIT PHOTOGRAPHS OF THE HAUL ROAD TO THE ENGINEER AS SPECIFIED.
3. CAUTION! THE HAUL ROAD VARIES FROM TWO LANES TO 1 LANE AT VARIOUS POINTS ALONG THE ROUTE. ONLY HAUL TRUCKS SUITABLE FOR USE ON CITY OF GALENA AND STATE OF ALASKA PUBLIC ROADS ARE PERMITTED. OBEY ALL POSTED SPEED LIMITS AND PREVAILING TRAFFIC LAWS. SEE SHEET C-6.
4. MAINTAIN THE HAUL ROAD THROUGHOUT HAULING OPERATIONS. REPAIR OR REPLACE ANY PORTIONS OF THE ROAD DAMAGED DURING HAULING OPERATIONS.
5. OBTAIN ANY HAULING PERMITS THAT MAY BE REQUIRED BY LOCAL AND STATE AUTHORITIES PRIOR TO TRANSPORTING SOILS.
6. MANAGE FUGITIVE DUST FROM HAULING OPERATIONS ACCORDING TO THE SPECIFICATIONS AND CH2M HILL'S STORM WATER POLLUTION PREVENTION PLAN (SWPPP)
7. DISPOSE OF NON-HAZARDOUS DEMOLITION DEBRIS AT THE LOCAL LANDFILL OR OTHER APPROVED DISPOSAL SITE AS SPECIFIED.

SURVEY CONTROL

1. THE COORDINATE SYSTEM IS ALASKA STATE PLANE ZONE 6, NAD 83 DATUM. ALL COORDINATES AND ELEVATIONS ARE EXPRESSED IN U.S. SURVEY FEET.
2. THE BASIS FOR HORIZONTAL AND VERTICAL CONTROL IS A GPS STATIC CONTROL SURVEY UTILIZING THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING SYSTEM (OPUS). THE ADJUSTMENT IS CONSTRAINED TO "STATION 8", A FOUND BRASS CAP NGS MONUMENT.



NO.	DATE	REVISION	CHK	DR	BY
1	6-28-11	TRAFFIC CONTROL SIGNS AND HAUL ROUTE CONTROL	J. TAYLOR	J. TAYLOR	J. TRACY
2					R. THOMPSON

CH2MHILL

EXCAVATION AT SITE SS005 & AST 1569
CIVIL
HAUL ROUTES
& SURVEY CONTROL

DATE	JUNE 2011
PROJ	408222
DWG	C-1
SHEET	5

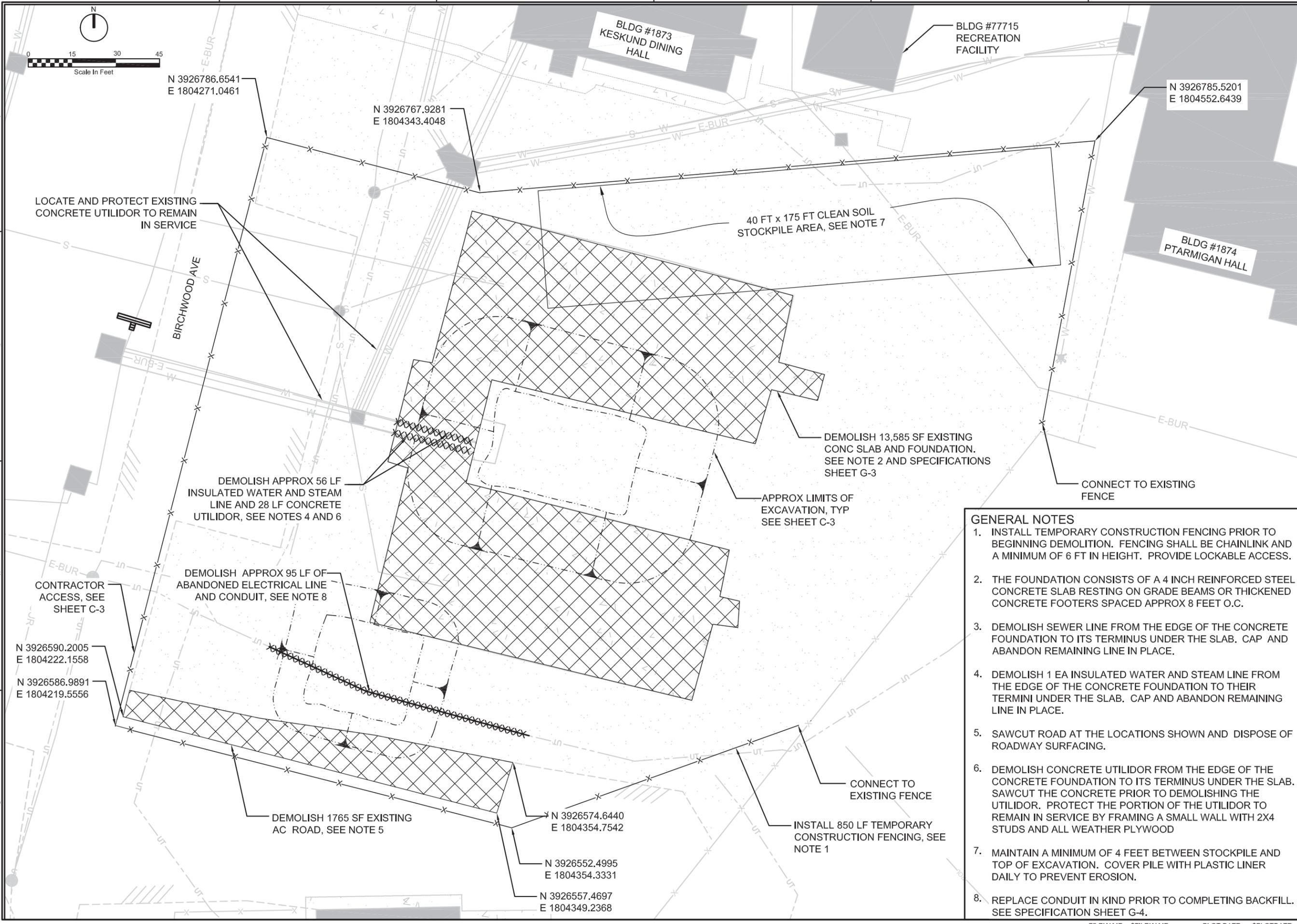


NO.	DATE	DR	REVISION	CHK	BY
		J. TAYLOR	J. TAYLOR	J. TRACY	R. THOMPSON

EXCAVATION AT SITE SS005 & AST 1569	
CIVIL	
DEMOLITION PLAN	
SITE SS005	

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	JUNE 2011
PROJ	408222
DWG	C-2
SHEET	6

FILENAME: \$FILENAME	PLOT DATE: \$PLOTDATE	PLOT TIME: \$PLOTTIME
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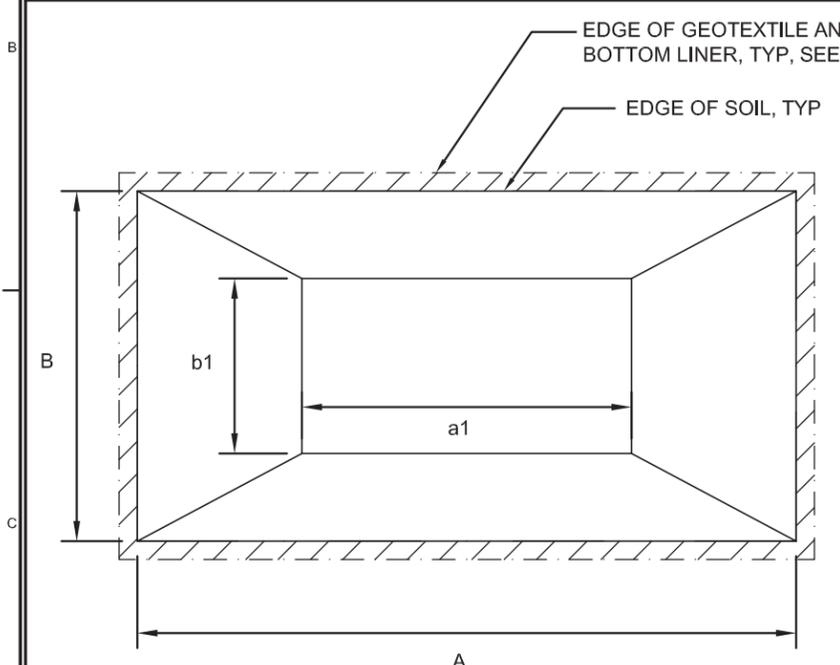
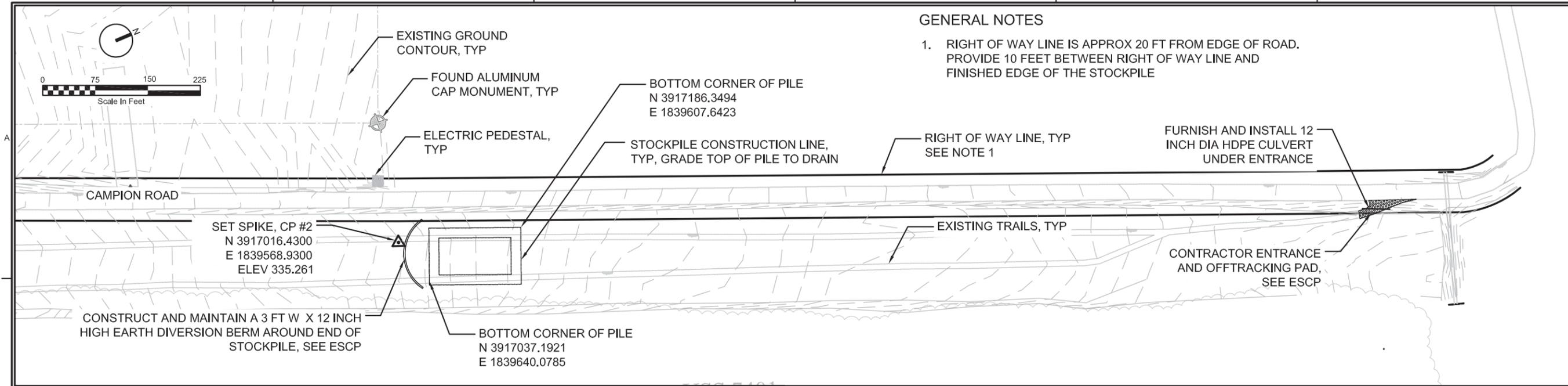


- GENERAL NOTES**
1. INSTALL TEMPORARY CONSTRUCTION FENCING PRIOR TO BEGINNING DEMOLITION. FENCING SHALL BE CHAINLINK AND A MINIMUM OF 6 FT IN HEIGHT. PROVIDE LOCKABLE ACCESS.
 2. THE FOUNDATION CONSISTS OF A 4 INCH REINFORCED STEEL CONCRETE SLAB RESTING ON GRADE BEAMS OR THICKENED CONCRETE FOOTERS SPACED APPROX 8 FEET O.C.
 3. DEMOLISH SEWER LINE FROM THE EDGE OF THE CONCRETE FOUNDATION TO ITS TERMINUS UNDER THE SLAB. CAP AND ABANDON REMAINING LINE IN PLACE.
 4. DEMOLISH 1 EA INSULATED WATER AND STEAM LINE FROM THE EDGE OF THE CONCRETE FOUNDATION TO THEIR TERMINI UNDER THE SLAB. CAP AND ABANDON REMAINING LINE IN PLACE.
 5. SAWCUT ROAD AT THE LOCATIONS SHOWN AND DISPOSE OF ROADWAY SURFACING.
 6. DEMOLISH CONCRETE UTILIDOR FROM THE EDGE OF THE CONCRETE FOUNDATION TO ITS TERMINUS UNDER THE SLAB. SAWCUT THE CONCRETE PRIOR TO DEMOLISHING THE UTILIDOR. PROTECT THE PORTION OF THE UTILIDOR TO REMAIN IN SERVICE BY FRAMING A SMALL WALL WITH 2X4 STUDS AND ALL WEATHER PLYWOOD
 7. MAINTAIN A MINIMUM OF 4 FEET BETWEEN STOCKPILE AND TOP OF EXCAVATION. COVER PILE WITH PLASTIC LINER DAILY TO PREVENT EROSION.
 8. REPLACE CONDUIT IN KIND PRIOR TO COMPLETING BACKFILL. SEE SPECIFICATION SHEET G-4.



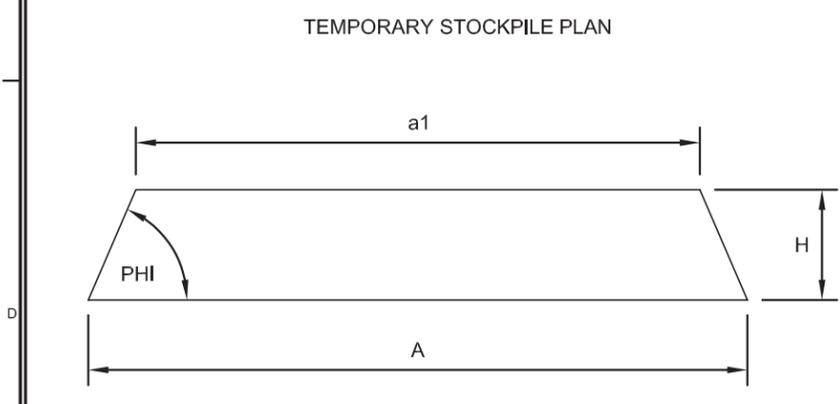
GENERAL NOTES

1. RIGHT OF WAY LINE IS APPROX 20 FT FROM EDGE OF ROAD. PROVIDE 10 FEET BETWEEN RIGHT OF WAY LINE AND FINISHED EDGE OF THE STOCKPILE



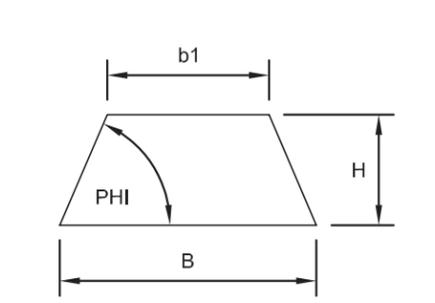
STOCKPILE DIMENSIONS		
POINT	DIMENSION	REMARK
A	225 FT	EDGE OF SOIL
a1	200 FT	EDGE OF SOIL
B	80 FT	EDGE OF SOIL
b1	48 FT	EDGE OF SOIL
PHI	27 °	2H : 1V
H	7 FT	-

- NOTES:
1. CONSTRUCT BOTTOM LINER AND GEOTEXTILE 10 FT BEYOND THE EDGE OF SOIL LIMITS, AS SPECIFIED
 2. WRAP BOTTOM LINER UP STOCKPILE PRIOR TO PLACING TOPCOVER, PIN LINER TO STOCKPILE.

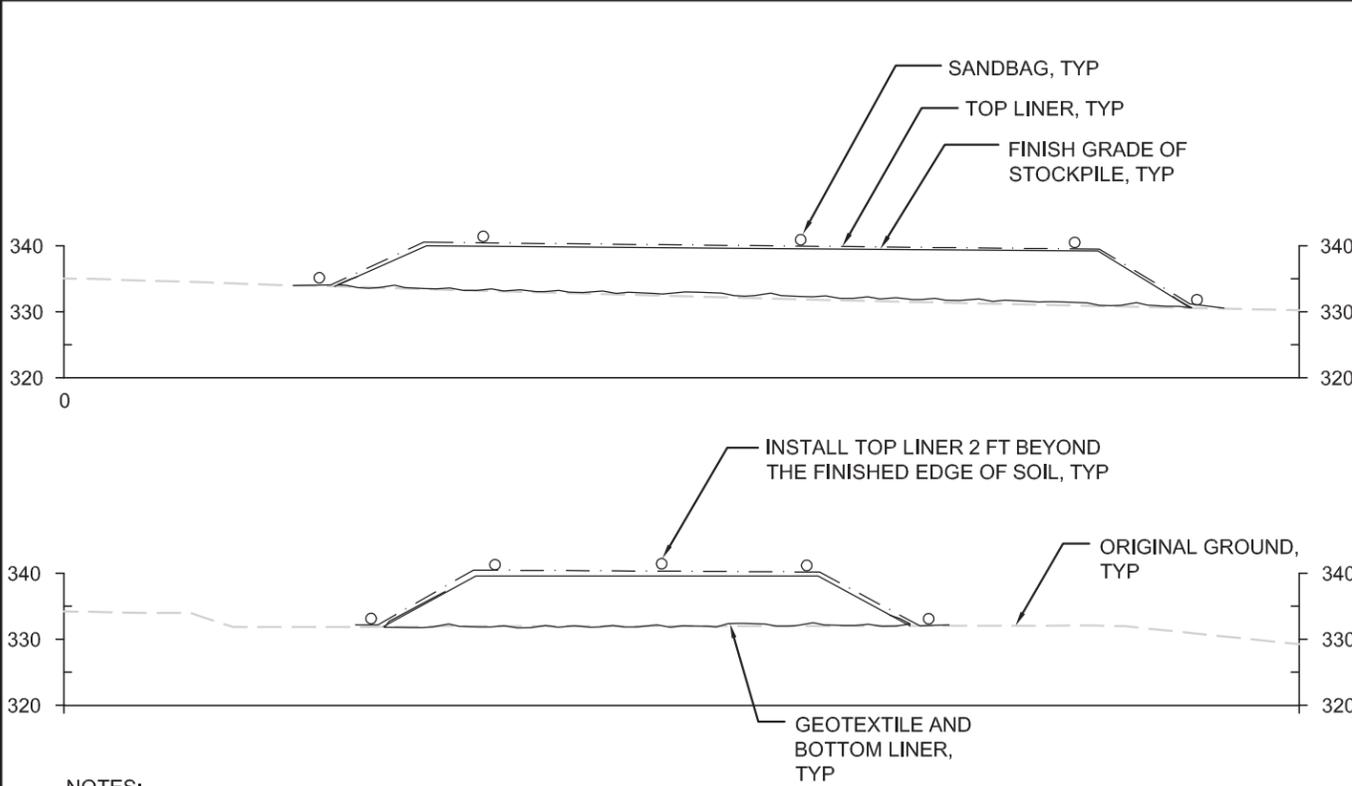


TEMPORARY STOCKPILE ELEVATION

TEMPORARY STOCKPILE DETAILS



TEMPORARY STOCKPILE ELEVATION



- NOTES:
1. PLACE OWNER FURNISHED TOP LINER OVER FINISHED STOCKPILE DAILY, AS SPECIFIED.
 2. SECURE TOPLINER WITH SANDBAGS TO PREVENT LINER DISPLACEMENT FROM WIND. USE ROPE IF REQUIRED.
 3. CONSTRUCT OWNER FURNISHED BOTTOM LINER AND GEOTEXTILE AS SPECIFIED

TEMPORARY STOCKPILE ELEVATIONS

NTS

NO.	DATE	DR	REVISION	CHK	BY	APVD
		J. TAYLOR			J. TRACY	R. THOMPSON
		J. TAYLOR				

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CH2MHILL

EXCAVATION AT SITE SS005 & AST 1669

CIVIL

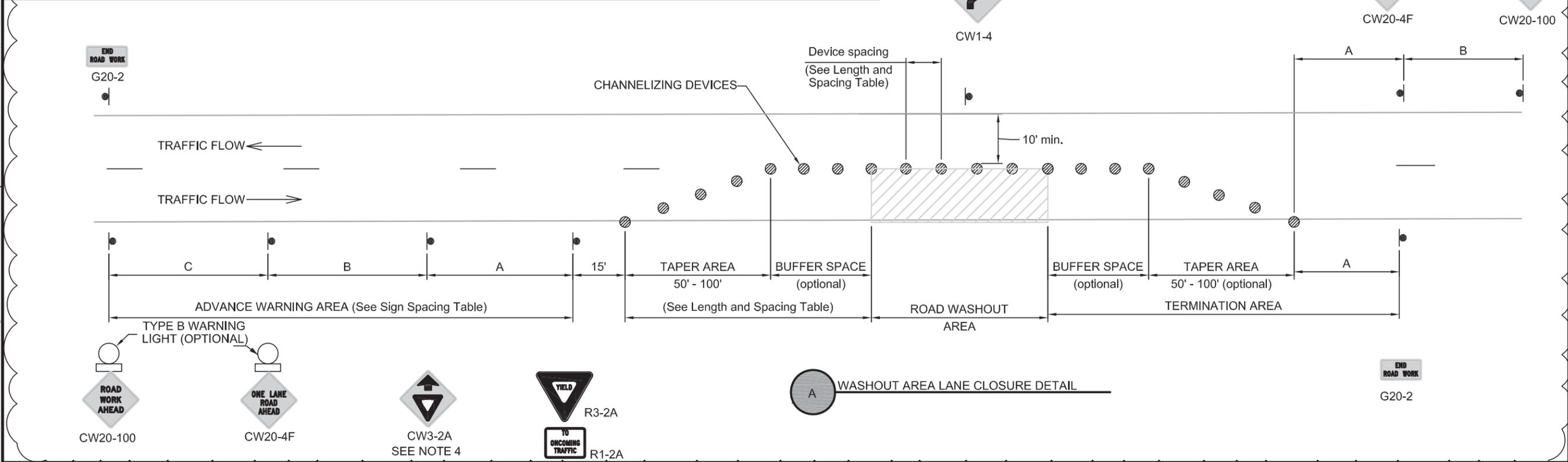
TEMPORARY STOCKPILE PLAN

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
DATE JUNE 2011
PROJ 408222
DWG C-4
SHEET 8

LENGTH AND SPACING TABLE				
APPROACH SPEED*	BUFFER SPACE LENGTH	CHANNELIZING DEVICE		
		TAPER AREA	BUFFER SPACE	WASHOUT AREA
MPH	FEET	SPACING IN FEET		
20	115	20	40	NA
25	155	20	50	NA
30	200	20	60	NA
35	250	20	70	NA
40	305	20	80	NA
45	360	20	90	NA
50	425	20	100	NA
55	495	20	110	NA
60	570	20	120	NA
65	645	20	130	NA
70	730	20	140	NA

SIGN SPACING TABLE			
ROAD TYPE	DISTANCE BETWEEN SIGNS IN FEET		
	A	B	C
URBAN AND RURAL 30 MPH AND LESS	100	100	100
URBAN AND RURAL 35 MPH TO 50 MPH	350	350	350
RURAL GREATER THAN 50 MPH	500	500	500
EXPRESSWAY/FREEWAY	1000	1500	2640

- GENERAL NOTES:**
- SIGNS SHALL MEET THE CONVENTIONAL STANDARD FOR SIGNS ACCORDING TO THE AKDOT&PF ALASKA SIGN DESIGN SPECIFICATIONS.
 - THIS LAYOUT APPLIES AT ALL WASHOUT AREAS WHERE SUFFICIENT GAPS IN ONCOMING TRAFFIC EXIST FOR TRAFFIC THAT MUST YIELD, AND WHEN DRIVERS FROM BOTH DIRECTIONS ARE ABLE TO SEE APPROACHING TRAFFIC THROUGH AND BEYOND THE WASHOUT AREA.
 - WASHOUT AREA LENGTHS ARE APPROXIMATE. FIELD VERIFY ACTUAL WASHOUT AREA LENGTH AT TIME OF CONSTRUCTION. USE THE "YIELD AHEAD" (W3-2) SIGN WHEN APPROACH SPEEDS EXCEED 50 MPH.
 - DO NOT ALLOW EQUIPMENT, MATERIALS, OR VEHICLES TO BE PARKED OR STORED IN THE BUFFER SPACE.
 - MINIMUM ROADWAY WIDTH FOR TWO WAY TRAFFIC IS 20 FT. WHERE ROADWAY WIDTH IS LESS THAN 20 FT, SIGN AND CHANNELIZE THE REDUCED WIDTH SEGMENT AS A LANE CLOSURE IN ACCORDANCE WITH THE LANE CLOSURE DETAIL.



NO. DSGN	6-28-11	DATE	TRAFFIC CONTROL SIGNS AND HAUL ROUTE CONTROL	BY	APVD
CHK	J. TAYLOR	DR	J. TRACY	APVD	R. THOMPSON

CH2MHILL
EXCAVATION AT SITE S5005 AND AST 1569
CIVIL
TRAFFIC CONTROL AT
HAUL ROUTE WASHOUT AREAS

VERIFY SCALE	DATE	JUNE 2011
BAR IS ONE INCH ON ORIGINAL DRAWING. 1" = 100'	PROJ	408222
	DWG	C-8
	SHEET	10

STOCKPILE BOTTOM LINER CONSTRUCTION

DESCRIPTION: CONSTRUCT A TEMPORARY BOTTOM LINER FOR STOCKPILING CONTAMINATED SOILS. USE OWNER FURNISHED GEOTEXTILES AND BOTTOM LINER MATERIAL. CONSTRUCT LINER ON AN EXISTING PREPARED SURFACE AT THE LOCATION SHOWN ON THE PLANS.

CONSTRUCTION REQUIREMENTS:

SURFACE PREPARATION. THE EXISTING SURFACE HAS BEEN PREPARED BY REMOVAL OF STUMPS, BRUSH, BOULDERS, VEGETATION AND SHARP OBJECTS AND ROUGH GRADED. THE AREA CONSISTS OF SOFT SANDS AND SILTS. IMPORT MATERIAL AS REQUIRED TO ACCOMMODATE CONSTRUCTION EQUIPMENT. FILL ANY HOLES AND LARGE RUTS WITH GRAVEL, SAND OR OTHER MATERIAL AS APPROVED. GRADE SURFACE, AS REQUIRED, TO BE SMOOTH, UNIFORM AND FREE DRAINING.

GEOTEXTILE AND BOTTOM LINER PLACEMENT: UNROLL OWNER FURNISHED BOTTOM LINER DIRECTLY ONTO THE PREPARED SURFACE. STRETCH LINER TO REMOVE ANY CREASES OR WRINKLES. DO NOT EXPOSE LINER TO THE ELEMENTS FOR LONGER THAN 5 DAYS AFTER REMOVAL OF PROTECTIVE COVERING. LAY LINER PARALLEL TO ROADWAY CENTERLINE. STRAIGHTEN THE LINER AND OVERLAP BUTT ENDS. ENSURE THAT THE LAP TRENDS DOWN HILL. OVERLAPPED SECTIONS MUST OVERLAP BY 5 FEET.

PLACE THE GEOTEXTILE ON TOP OF THE BOTTOM LINER ACCORDING TO THE SAME INSTALLATION REQUIREMENTS. OVERLAP GEOTEXTILE BUTT ENDS BY 3 FEET.

MATERIAL PLACING AND SPREADING: DURING PLACING AND SPREADING, MAINTAIN A MINIMUM DEPTH OF 12 INCHES OF COVER MATERIAL AT ALL TIMES BETWEEN THE FABRIC AND THE WHEELS OR TRACKS OF THE CONSTRUCTION EQUIPMENT. SPREAD THE MATERIAL IN THE DIRECTION OF THE FABRIC OVERLAP. MAINTAIN PROPER OVERLAP AND FABRIC CONTINUITY. ON WEAK SUBGRADES SPREAD THE COVER MATERIAL SIMULTANEOUSLY WITH DUMPING TO MINIMIZE THE POTENTIAL OF A LOCALIZED SUBGRADE FAILURE. DO NOT ALLOW CONSTRUCTION EQUIPMENT TO MAKE SUDDEN STOPS, STARTS, OR TURNS ON THE COVER MATERIAL.

GEOTEXTILE AND LINER REPAIR: OVERLAY TORN AREA WITH GEOTEXTILE OR LINER WITH A MINIMUM 3 FOOT OVERLAP AROUND THE EDGES OF THE TORN AREA. ENSURE THAT THE PATCH REMAINS IN PLACE WHEN MATERIAL IS PLACED OVER THE AFFECTED AREA.

METHOD OF MEASUREMENT: CONTRACT SCOPE OF WORK

BASIS OF PAYMENT: ANY WORK ASSOCIATED WITH SUBGRADE PREPARATION AND GRADING, GEOTEXTILE AND LINER PATCHING AND WRAPPING AND STAKING OF LINER OVER THE COMPLETED PILE IS INCIDENTAL TO STOCKPILE LINER BOTTOM CONSTRUCTION.

EROSION CONTROL AND SEDIMENT CONTROL

DESCRIPTION: PLAN, PROVIDE, INSPECT, AND MAINTAIN CONTROL OF EROSION, SEDIMENTATION, WATER POLLUTION, AND HAZARDOUS MATERIALS CONTAMINATION. COMPLY WITH THE STORMWATER POLLUTION PREVENTION PLAN PROVIDED IN THE CONTRACT.

CONSTRUCTION REQUIREMENTS:

COMPLY WITH ALL REQUIREMENTS OF THE APPROVED STORMWATER PLAN AND ALL STATE AND FEDERAL REGULATIONS THAT PERTAIN TO THE HANDLING, STORAGE, CLEANUP, AND DISPOSAL OF PETROLEUM PRODUCTS OR OTHER HAZARDOUS SUBSTANCES. CONTAIN, CLEAN UP, AND DISPOSE OF ALL DISCHARGES OF PETROLEUM PRODUCTS AND/OR OTHER MATERIALS HAZARDOUS TO THE LAND, AIR, WATER, AND ORGANIC LIFE FORMS. PERFORM ALL FUELING OPERATIONS IN A SAFE AND ENVIRONMENTALLY RESPONSIBLE MANNER. COMPLY WITH THE REQUIREMENTS OF 18 AAC 75 AND AS 46, OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTROL. REPORT OIL SPILLS AS REQUIRED BY FEDERAL, STATE AND LOCAL LAW.

COMPLY WITH ALL REQUIREMENTS OF THE STORMWATER PERMIT, IMPLEMENT AND MAINTAIN ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLANS. MAINTAIN ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION.

PERFORM INSPECTIONS AND PREPARE INSPECTION REPORTS IN COMPLIANCE WITH THE PROJECT PLANS AND PERMITS.

STREET SWEEPING: KEEP FREE OF LOOSE MATERIAL ALL PORTIONS OF THE ROADWAY AND HAUL ROUTES OPEN TO THE PUBLIC, INCLUDING SECTIONS OF ROADWAY OFF THE PROJECT WHERE YOUR OPERATIONS HAVE DEPOSITED LOOSE MATERIAL. USE A BROOM TO EJECT THE MATERIAL OUTSIDE THE TRAVELED WAY. COLLECT AND DISPOSE OF ANY EJECTED MATERIAL.

WATERING FOR DUST CONTROL: FURNISH, HAUL, AND PLACE WATER FOR DUST CONTROL. PROVIDE ENOUGH WATER TO ELIMINATE VISIBLE AIRBORNE DUST, OR AS DIRECTED. USE WATER TRUCKS THAT CAN PROVIDE A LIGHT-WATER SPRAY TO CONTROL DUST. IF THE FLUSHING OPERATIONS CONTAMINATE OR FILL ADJACENT CATCH BASINS, CLEAN AND RESTORE THEM TO THEIR ORIGINAL CONDITION. THIS REQUIREMENT INCLUDES SECTIONS OF ROADWAY OFF THE PROJECT WHERE FLUSHING IS REQUIRED. IF YOU TAKE WATER FROM A LAKE, STREAM, OR OTHER NATURAL WATER BODY, FIRST OBTAIN A WATER REMOVAL PERMIT FROM THE ALASKA DEPARTMENT OF NATURAL RESOURCES. COMPLY WITH THE ALASKA DEPARTMENT OF FISH AND GAME SCREENING REQUIREMENTS FOR ALL WATER REMOVAL OPERATIONS. COORDINATE WITH THE CITY OF GALENA FOR USE OF CITY WATER.

CONTRACTOR TRACKING PAD AND ENTRANCE: CONSTRUCT CONTRACTOR TRACKING PADS AS SHOWN ON ESCP. REMOVE TRACKING PADS UPON COMPLETION OF WORK. TRACKING PAD(S) INSTALLED AT THE TEMPORARY STOCKPILE ARE TO REMAIN IN PLACE. BRUSH HAUL TRUCK TIRES TO REMOVE SEDIMENT PRIOR TO LEAVING THE EXCAVATION AND STOCKPILE AREAS.

METHOD OF MEASUREMENT: CONTRACT SCOPE OF WORK

BASIS OF PAYMENT: ALL WATERING FOR DUST CONTROL AND OBTAINING ANY REQUIRED PERMITS, CONSTRUCTION AND DEMOLITION AT COMPLETION OF TRACKING PADS, STOCKPILE DIVERSION BERMS AND MAINTENANCE OF DITCHES AND PREVIOUSLY INSTALLED BMP'S ARE INCIDENTAL TO THIS ITEM.

MAINTENANCE OF TRAFFIC

DESCRIPTION: PROTECT AND CONTROL TRAFFIC DURING THE CONTRACT. FURNISH, ERECT, MAINTAIN, REPLACE, CLEAN, MOVE AND REMOVE THE TRAFFIC CONTROL DEVICES REQUIRED TO ENSURE THE TRAVELING PUBLIC'S SAFETY. PERFORM ALL ADMINISTRATIVE RESPONSIBILITIES NECESSARY TO IMPLEMENT THIS WORK.

MAINTAIN ALL ROADWAYS AND PEDESTRIAN AND BICYCLE FACILITIES AFFECTED BY THE WORK IN A SMOOTH AND PASSABLE CONDITION. MAINTAIN EXISTING TRAFFIC PATTERNS AT ALL TIMES DURING CONSTRUCTION.

ROADWAY CHARACTERISTICS DURING CONSTRUCTION: CONDUCT CONSTRUCTION TO PROVIDE A SMOOTH AND EVEN SURFACE THAT PUBLIC TRAFFIC CAN USE AT ALL TIMES. PROPERLY CROWN THE ROADBED SURFACE FOR DRAINAGE. PRIOR TO COMMENCING HAULING OPERATIONS, TAKE PHOTOGRAPHS OF THE EXISTING ROAD AT THE LOCATIONS SPECIFIED BY THE ENGINEER. TAKE ANY ADDITIONAL PHOTOGRAPHS REQUIRED TO DOCUMENT THE CONDITION OF THE ROAD PRIOR TO BEGINNING CONSTRUCTION. SUBMIT THE PRECONSTRUCTION PHOTOGRAPHS PRIOR TO HAULING. TAKE PHOTOGRAPHS AT THE SAME LOCATIONS UPON COMPLETING CONSTRUCTION. SUBMIT THE POST HAULING PHOTOGRAPHS AS PART OF THE APPLICATION FOR FINAL PAYMENT.

GENERAL CONSTRUCTION REQUIREMENTS: KEEP THE WORK, AND PORTIONS OF THE PROJECT AFFECTED BY THE WORK, IN GOOD CONDITION TO ACCOMMODATE TRAFFIC SAFELY. PROVIDE AND MAINTAIN TRAFFIC CONTROL DEVICES AND SERVICES INSIDE AND OUTSIDE THE PROJECT LIMITS, DAY AND NIGHT, TO GUIDE TRAFFIC SAFELY.

UNLESS OTHERWISE PROVIDED IN THIS SECTION, KEEP ALL ROADWAYS, BUSINESS ACCESSES, AND PEDESTRIAN FACILITIES WITHIN AND ADJACENT TO THE PROJECT LIMITS OPEN TO TRAFFIC. OBTAIN THE ENGINEER'S APPROVAL BEFORE TEMPORARILY CLOSING RESIDENTIAL, COMMERCIAL, OR STREET APPROACHES IF REQUIRED. DO NOT RESTRICT ACCESS OF EMERGENCY VEHICLES. DO NOT REDIRECT OR STOP THE TRAVELING PUBLIC.

STOP YOUR EQUIPMENT AT ALL POINTS OF INTERSECTION WITH THE TRAVELING PUBLIC UNLESS AN APPROVED TCP SHOWS OTHERWISE.

PROVIDE AND MAINTAIN SAFE ROUTES FOR PEDESTRIANS AND BICYCLISTS THROUGH OR AROUND TRAFFIC CONTROL ZONES AT ALL TIMES, EXCEPT WHEN REGULATIONS PROHIBIT PEDESTRIANS OR BICYCLISTS.

PUBLIC NOTICE: MAKE SURE THE WORK SITE TRAFFIC SUPERVISOR GIVES NOTICES OF MAJOR CHANGES, DELAYS, LANE RESTRICTIONS, OR ROAD CLOSURES TO LOCAL OFFICIALS AND TRANSPORTATION ORGANIZATIONS, INCLUDING BUT NOT NECESSARILY LIMITED TO

- ALASKA STATE TROOPERS
- LOCAL FIRE DEPARTMENT
- LOCAL GOVERNMENT TRAFFIC ENGINEER
- SCHOOL AND TRANSIT AUTHORITIES
- LOCAL EMERGENCY MEDICAL SERVICES
- LOCAL MEDIA (NEWSPAPERS, RADIO, TELEVISION)
- U.S. POSTAL SERVICE

TEMPORARY CONSTRUCTION SIGNS: PROVIDE TEMPORARY CONSTRUCTION SIGNS AT THE LOCATIONS SHOWN ON THE PLANS.

PORTABLE SIGN SUPPORTS: USE WIND-RESISTANT SIGN SUPPORTS WITH NO EXTERNAL BALLASTING. USE SIGN SUPPORTS THAT CAN VERTICALLY SUPPORT A 48 X 48 INCH TRAFFIC CONTROL SIGN AT THE HEIGHT ABOVE THE ADJACENT ROADWAY SURFACE REQUIRED BY THE ALASKA TRAFFIC MANUAL

METHOD OF MEASUREMENT: CONTRACT SCOPE OF WORK

BASIS OF PAYMENT: ALL GRADING WORK ASSOCIATED WITH MAINTAINING A SMOOTH AND EVEN SURFACE FOR THE PUBLICS USE IS INCIDENTAL TO THE MAINTENANCE OF TRAFFIC ITEM.

UTILITY CONDUIT

DESCRIPTION: REPLACE CONDUIT DEMOLISHED DURING EXCAVATION.

CONSTRUCTION REQUIREMENTS: PRIOR TO COMPLETING BACKFILL, REPLACE CONDUIT DEMOLISHED DURING EXCAVATION TO THE APPROXIMATE LINE AND DEPTH OF THE ORIGINAL CONDUIT, OR AS DIRECTED. SECURE JOINTS ACCORDING TO THE MANUFACTURERS INSTRUCTIONS. IF REQUIRED, FACILITATE PULLING NEW WIRE BY ROUTING WIRE THROUGH THE CONDUIT AND SECURING TO THE DEMOLISHED ENDS OF ELECTRICAL WIRE REMAINING ON BOTH SIDES. PROTECT CONDUIT DURING REMAINING BACKFILLING OPERATIONS.

METHOD OF MEASUREMENT: CONTRACT SCOPE OF WORK

BASIS OF PAYMENT: ALL WORK REQUIRED FOR A COMPLETE INSTALLATION SHALL BE INCIDENTAL TO THIS ITEM.



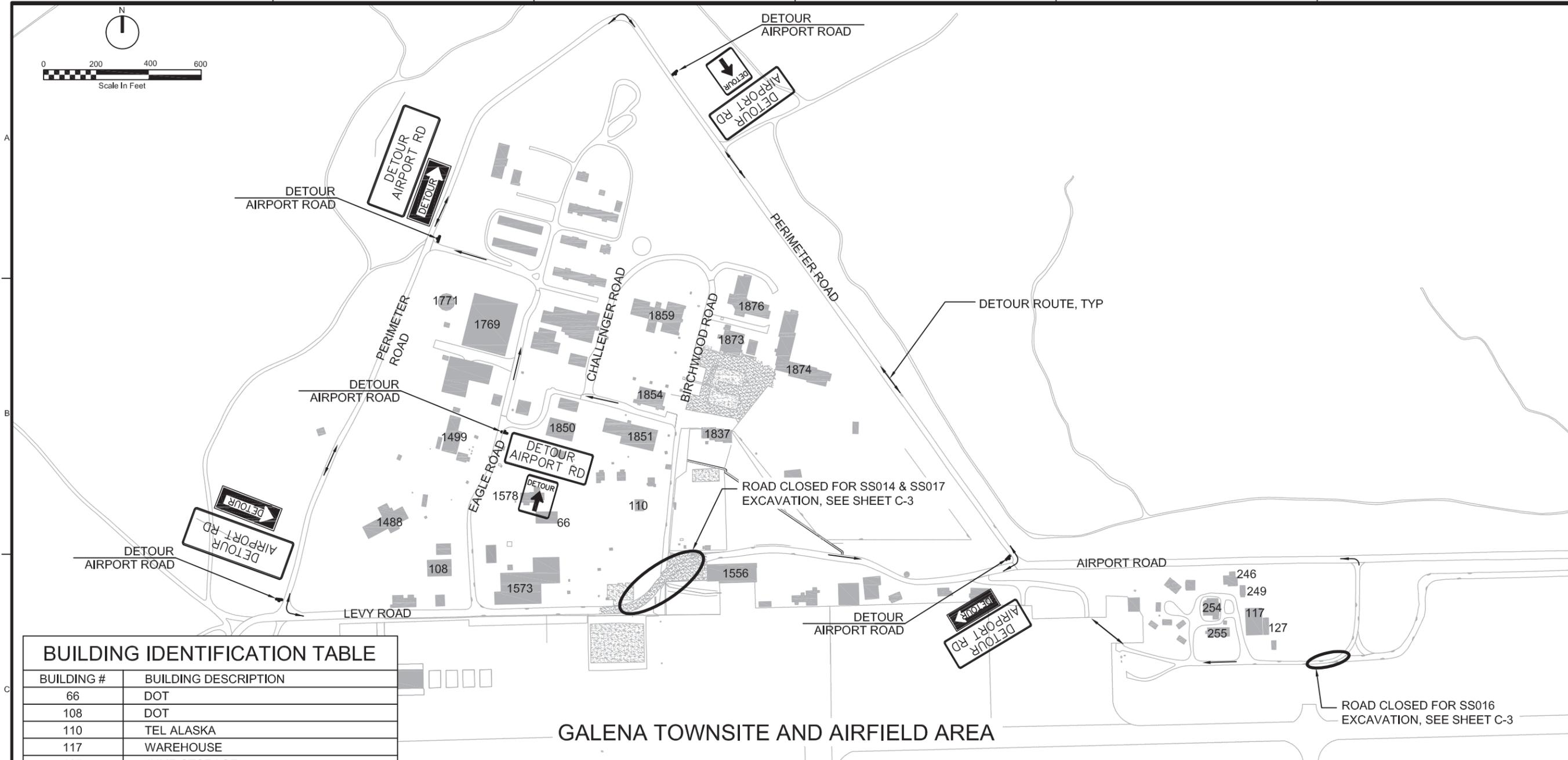
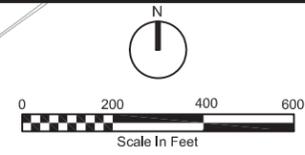
NO.	DATE	DESIGN	CHK	REVISION	BY
		J. TAYLOR	J. TAYLOR	J. TRACY	R. THOMPSON

NO.	DATE	DESIGN	CHK	REVISION	BY
		J. TAYLOR	J. TAYLOR	J. TRACY	R. THOMPSON

CH2MHILL	
EXCAVATION AT SITES SS014 & SS016 & SS017	CIVIL CONSTRUCTION SPECIFICATIONS

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	JULY 13, 2011
PROJ	408222
DWG	G-4
SHEET	4

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GALENA TOWNSITE AND AIRFIELD AREA

BUILDING IDENTIFICATION TABLE

BUILDING #	BUILDING DESCRIPTION
66	DOT
108	DOT
110	TEL ALASKA
117	WAREHOUSE
127	JUMP STORAGE
246	MAINTENANCE
249	USFS
254	MESS HALL
255	OFFICE
1488	MUNITIONS STORAGE
1499	POWER PLANT
1556	FIRE DEPARTMENT (NOT IN SERVICE)
1573	VEHICLE MAINTENANCE FACILITY
1578	WATER TREATMENT PLANT
1769	BASE SUPPLY
1771	RADAR TOWER
1837	PETROLEUM OPERATIONS FACILITY
1850	BASE CIVIL ENGINEER
1851	CO-LOCATED GYM
1854	HEADQUARTERS BUILDING
1859	TWO SEASONS DINING HALL
1873	KESKUND DINING HALL
1874	PTARMIGAN HALL
1876	IDITAROD INN

GENERAL NOTES

1. ALL SIGNS INSTALLED IN STATE RIGHTS OF WAY SHALL BE FABRICATED, LOCATED AND INSTALLED IN CONFORMANCE WITH THE ALASKA TRAFFIC MANUAL (ATM), ALASKA SIGN DESIGN MANUAL (ASDS), AND STANDARD DRAWINGS AND SPECIFICATIONS.
2. IMPLEMENT THE TRAFFIC CONTROL PLAN AND MAINTAIN TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE ALASKA TRAFFIC MANUAL AND ANY PROVISIONS AND CONDITIONS NOTED.
3. IF YOU DAMAGE ANY IMPROVEMENTS WITHIN THE STATE OWNED RIGHT OF WAY, YOU WILL BE RESPONSIBLE TO RETURN THEM TO THEIR PREVIOUS CONDITION. THE DEPARTMENT'S MAINTENANCE AND OPERATIONS SECTION WILL INSPECT AND APPROVE THE RESTORED IMPROVEMENTS. IMPROVEMENTS MAY INCLUDE: PAVEMENT STRUCTURES, SIDEWALKS, CURB AND GUTTER, PATHWAYS, DRIVEWAYS, SIGNS, TRAFFIC MARKINGS, GUARDRAIL, DELINEATORS, HIGHWAY LIGHTING SYSTEMS, TRAFFIC SIGNAL SYSTEMS, DRAINAGE STRUCTURES AND MAILBOXES.
4. ALL SIGN LAYOUTS SHALL CONFORM TO THE ALASKA SIGN DESIGN SPECIFICATIONS. FABRICATE SPECIAL SIGNS FROM TYPE 8 OR 9 ORANGE FLUORESCENT REFLECTIVE SHEETING ON EITHER SHEET ALUMINUM OR PLYWOOD PANELS.
5. ADJUST SIGN LOCATIONS IN THE FIELD TO PROVIDE ADEQUATE SEPARATION FROM EXISTING SIGNS. ALL SIGNS SHALL BE VISIBLE. REMOVE ALL TRAFFIC CONTROL DEVICES WHEN NO LONGER NEEDED.

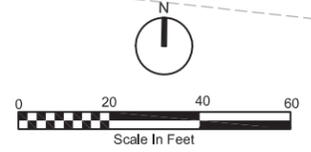
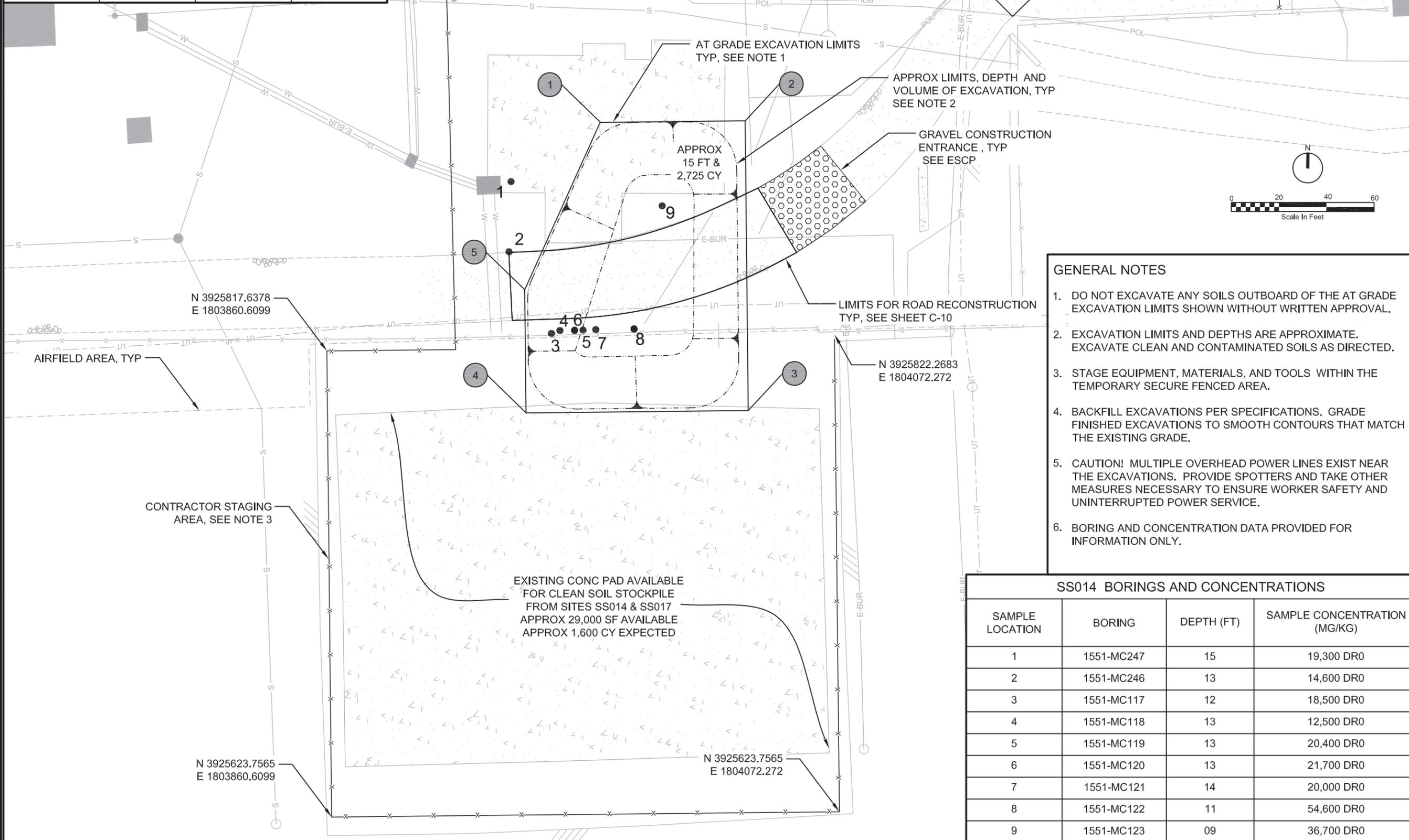
NO.	DATE	DR	REVISION	CHK	BY
		J. TAYLOR		J. TAYLOR	J. TRACY
		J. TAYLOR		J. TAYLOR	R. THOMPSON

CH2MHILL
 EXCAVATION AT SITES SS014 & SS016 & SS017
 CIVIL
 TRAFFIC CONTROL
 DETOUR PLAN

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING. 1" = 100'	
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PROJ	408222
DWG	C-2
SHEET	7

AT GRADE EXCAVATION LIMITS

POINT	NORTHING	EASTING	REMARK
1	3925911.5607	1803975.5533	SS014
2	3925911.5607	1804035.9943	SS014
3	3925791.0356	1804035.9943	SS014
4	3925791.0356	1803943.3415	SS014
5	3925842.2228	1803943.3415	SS014



GENERAL NOTES

- DO NOT EXCAVATE ANY SOILS OUTBOARD OF THE AT GRADE EXCAVATION LIMITS SHOWN WITHOUT WRITTEN APPROVAL.
- EXCAVATION LIMITS AND DEPTHS ARE APPROXIMATE. EXCAVATE CLEAN AND CONTAMINATED SOILS AS DIRECTED.
- STAGE EQUIPMENT, MATERIALS, AND TOOLS WITHIN THE TEMPORARY SECURED AREA.
- BACKFILL EXCAVATIONS PER SPECIFICATIONS. GRADE FINISHED EXCAVATIONS TO SMOOTH CONTOURS THAT MATCH THE EXISTING GRADE.
- CAUTION! MULTIPLE OVERHEAD POWER LINES EXIST NEAR THE EXCAVATIONS. PROVIDE SPOTTERS AND TAKE OTHER MEASURES NECESSARY TO ENSURE WORKER SAFETY AND UNINTERRUPTED POWER SERVICE.
- BORING AND CONCENTRATION DATA PROVIDED FOR INFORMATION ONLY.

SS014 BORINGS AND CONCENTRATIONS

SAMPLE LOCATION	BORING	DEPTH (FT)	SAMPLE CONCENTRATION (MG/KG)
1	1551-MC247	15	19,300 DR0
2	1551-MC246	13	14,600 DR0
3	1551-MC117	12	18,500 DR0
4	1551-MC118	13	12,500 DR0
5	1551-MC119	13	20,400 DR0
6	1551-MC120	13	21,700 DR0
7	1551-MC121	14	20,000 DR0
8	1551-MC122	11	54,600 DR0
9	1551-MC123	09	36,700 DR0

NO.	DATE	DR	REVISION	CHK	BY

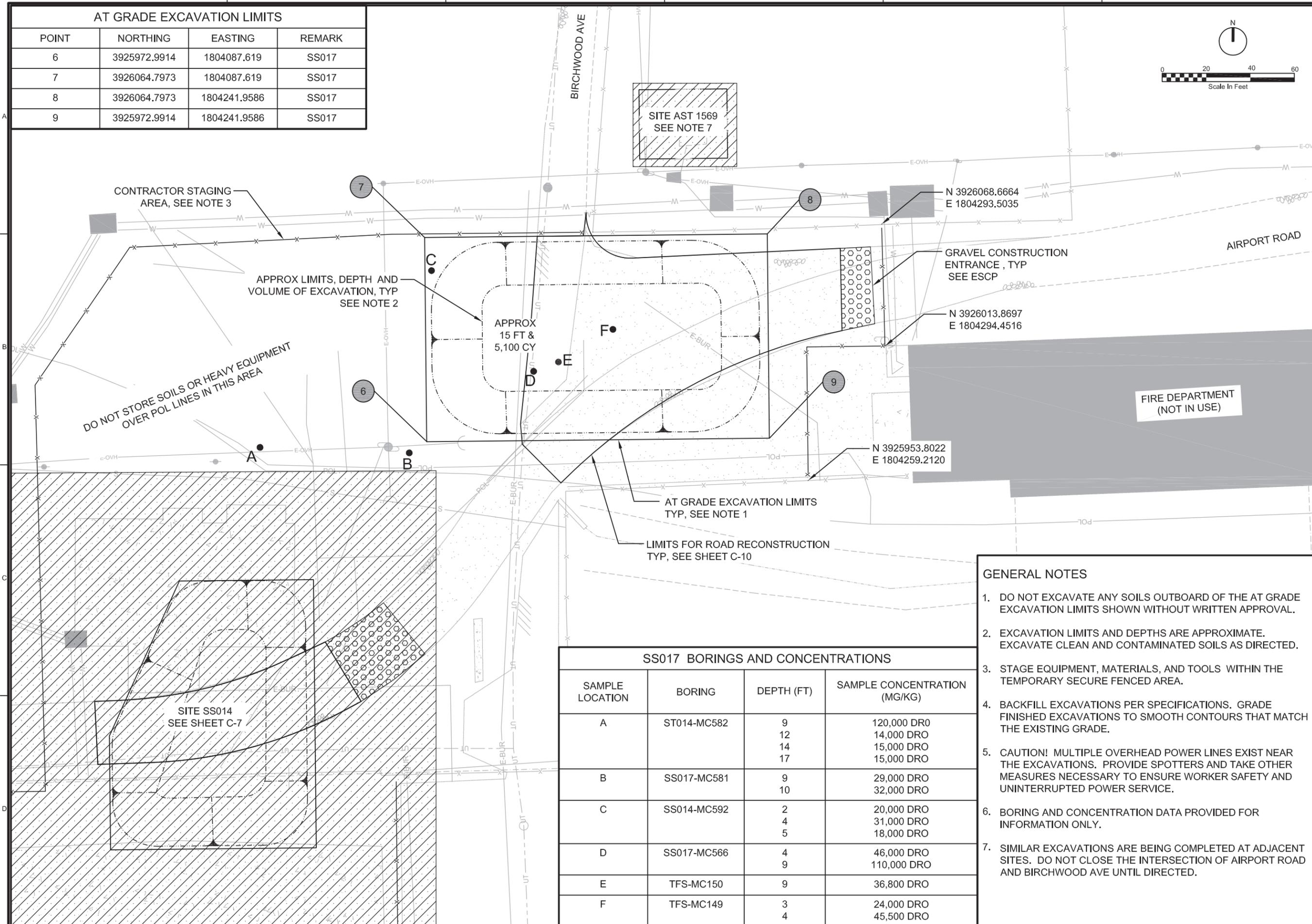
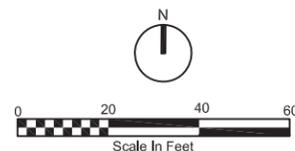
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 CIVIL
 SITE PLAN
 SITE SS014

EXCAVATION AT SITES SS014 & SS016 & SS017

DATE	JULY 13, 2011
PROJ	408222
DWG	C-7
SHEET	12

AT GRADE EXCAVATION LIMITS

POINT	NORTHING	EASTING	REMARK
6	3925972.9914	1804087.619	SS017
7	3926064.7973	1804087.619	SS017
8	3926064.7973	1804241.9586	SS017
9	3925972.9914	1804241.9586	SS017



SITE AST 1569
SEE NOTE 7

N 3926068.6664
E 1804293.5035

N 3926013.8697
E 1804294.4516

N 3925953.8022
E 1804259.2120

APPROX
15 FT &
5,100 CY

DO NOT STORE SOILS OR HEAVY EQUIPMENT
OVER POL LINES IN THIS AREA

SITE SS014
SEE SHEET C-7

SS017 BORINGS AND CONCENTRATIONS			
SAMPLE LOCATION	BORING	DEPTH (FT)	SAMPLE CONCENTRATION (MG/KG)
A	ST014-MC582	9	120,000 DRO
		12	14,000 DRO
		14	15,000 DRO
		17	15,000 DRO
B	SS017-MC581	9	29,000 DRO
		10	32,000 DRO
C	SS014-MC592	2	20,000 DRO
		4	31,000 DRO
		5	18,000 DRO
D	SS017-MC566	4	46,000 DRO
		9	110,000 DRO
E	TFS-MC150	9	36,800 DRO
F	TFS-MC149	3	24,000 DRO
		4	45,500 DRO

GENERAL NOTES

- DO NOT EXCAVATE ANY SOILS OUTBOARD OF THE AT GRADE EXCAVATION LIMITS SHOWN WITHOUT WRITTEN APPROVAL.
- EXCAVATION LIMITS AND DEPTHS ARE APPROXIMATE. EXCAVATE CLEAN AND CONTAMINATED SOILS AS DIRECTED.
- STAGE EQUIPMENT, MATERIALS, AND TOOLS WITHIN THE TEMPORARY SECURE FENCED AREA.
- BACKFILL EXCAVATIONS PER SPECIFICATIONS. GRADE FINISHED EXCAVATIONS TO SMOOTH CONTOURS THAT MATCH THE EXISTING GRADE.
- CAUTION! MULTIPLE OVERHEAD POWER LINES EXIST NEAR THE EXCAVATIONS. PROVIDE SPOTTERS AND TAKE OTHER MEASURES NECESSARY TO ENSURE WORKER SAFETY AND UNINTERRUPTED POWER SERVICE.
- BORING AND CONCENTRATION DATA PROVIDED FOR INFORMATION ONLY.
- SIMILAR EXCAVATIONS ARE BEING COMPLETED AT ADJACENT SITES. DO NOT CLOSE THE INTERSECTION OF AIRPORT ROAD AND BIRCHWOOD AVE UNTIL DIRECTED.

NO.	DATE	DR	REVISION	CHK	BY
		J. TAYLOR			R. THOMPSON
		J. TAYLOR			J. TRACY

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EXCAVATION AT SITES SS014 & SS016 & SS017
CIVIL
SITE PLAN
SITE SS017

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

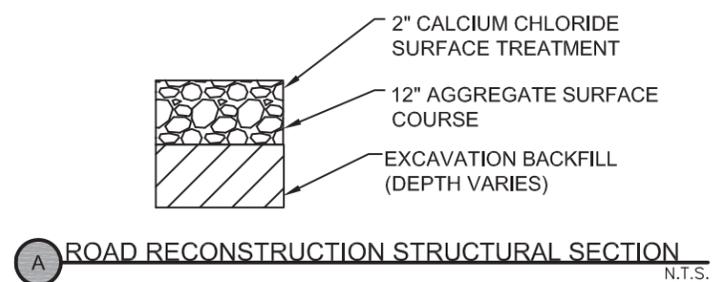
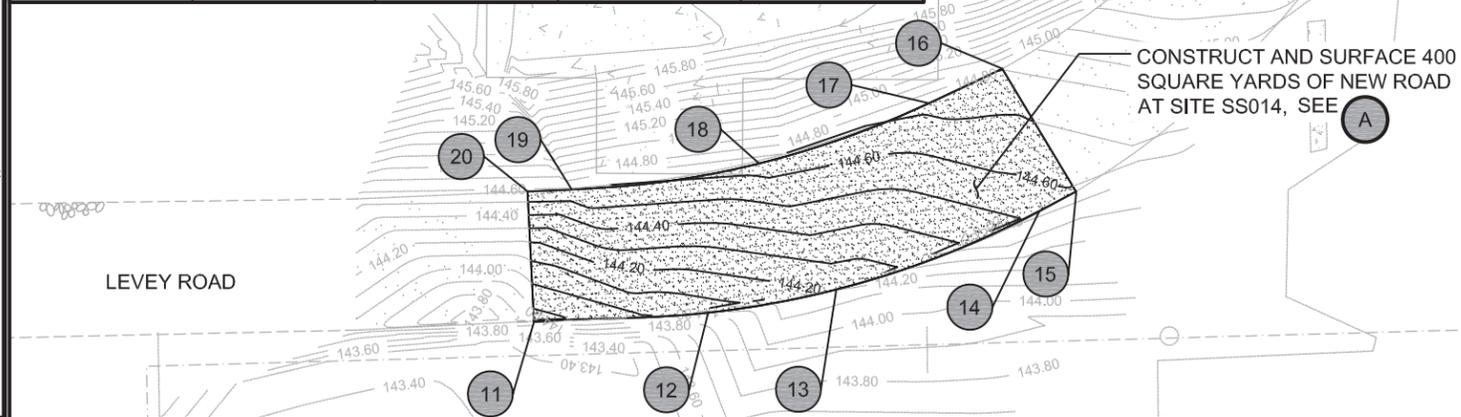
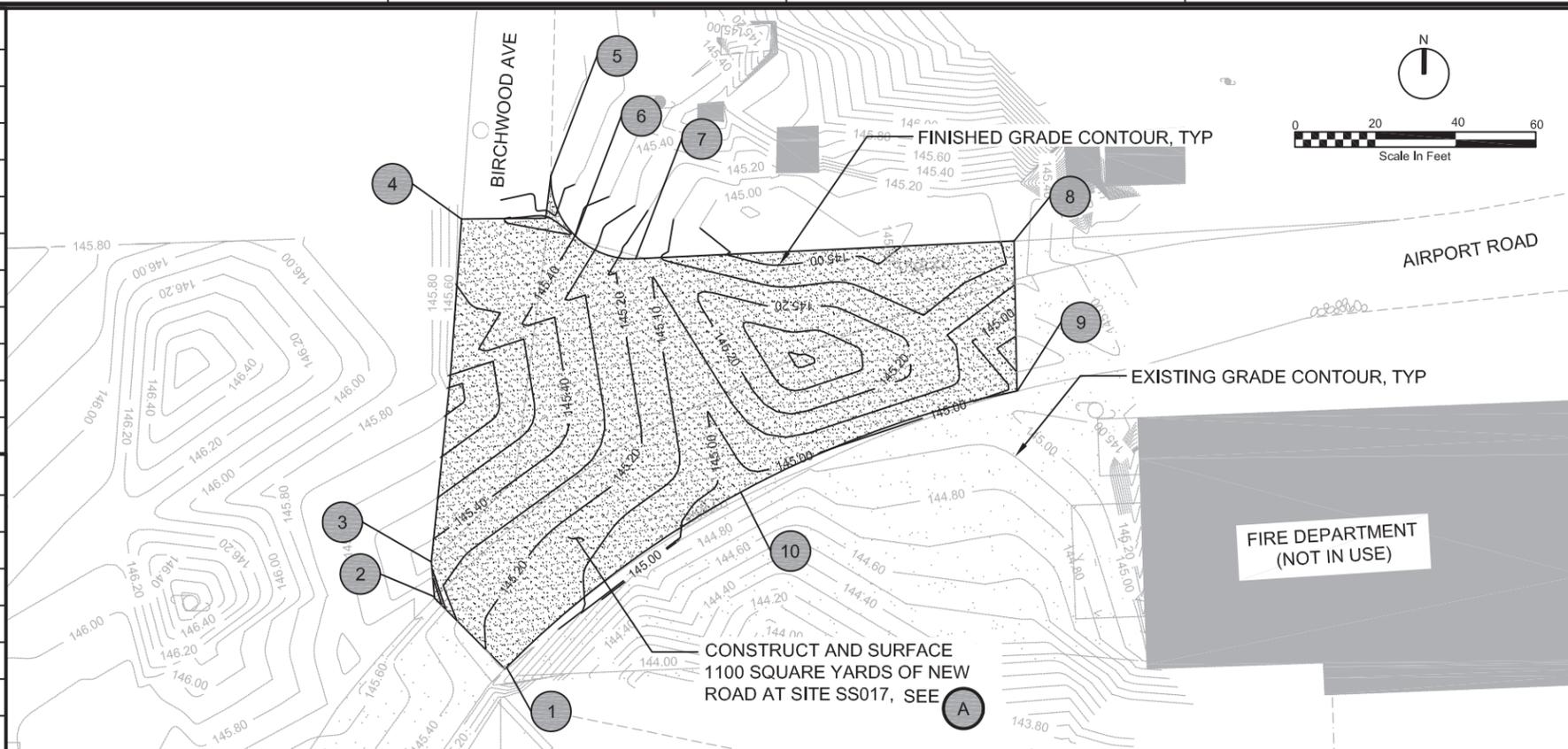
DATE JULY 13, 2011
PROJ 408222
DWG C-8
SHEET 13

POINT AND CURVE TABLE - RECONSTRUCT AT SS017

POINT	NORTHING	EASTING	ELEV	REMARK
1	3925954.2118	1804148.2581	MATCH EG	PT
2	3925971.8057	1804130.6427	MATCH EG	PT
3	3925980.437	1804129.9346	MATCH EG	PT
4	3926064.7973	1804138.325	MATCH EG	PT
5	3926075.2521	1804160.4758	MATCH EG	PC
6	3926060.3987	1804166.3341	MATCH EG	R = 20 FT
7	3926054.5669	1804181.1979	MATCH EG	PT
8	3926058.0044	1804274.7711	MATCH EG	PT
9	3926021.0397	1804275.1366	MATCH EG	PT
10	3925996.7919	1804206.5633	MATCH EG	R = 250 FT

POINT AND CURVE TABLE - RECONSTRUCT AT SS014

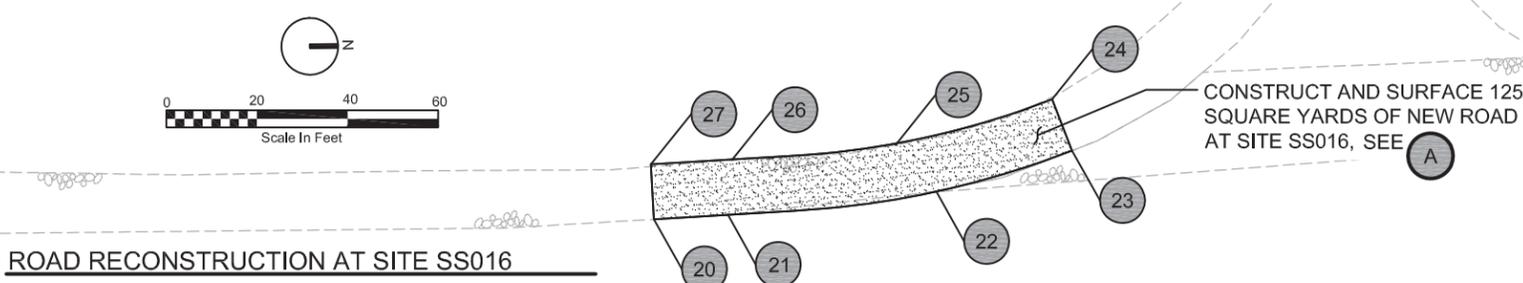
POINT	NORTHING	EASTING	ELEV	REMARK
11	3925829.5053	1803938.0271	MATCH EG	PT
12	3925830.9709	1803976.1524	MATCH EG	PC
13	3925835.5963	1804004.1978	MATCH EG	R = 200 FT
14	3925852.4018	1804048.8046	MATCH EG	PT
15	3925856.5852	1804056.8922	MATCH EG	PT
16	3925883.5253	1804041.0434	MATCH EG	PT
17	3925876.1613	1804024.9122	MATCH EG	PT
18	3925863.4034	1803987.6087	MATCH EG	R = 200 FT
19	3925858.1734	1803948.2654	MATCH EG	PC
20	3925857.823	1803936.9026	MATCH EG	PT



- GENERAL NOTES**
1. SEE SHEET G-5 FOR ROAD RECONSTRUCTION SPECIFICATIONS
 2. THE EXISTING ROAD CROSS SLOPE VARIES FROM 0% TO 6%. RECONSTRUCT ROAD TO PRECONSTRUCTION GRADE AND CROSS SLOPE.
 3. WARP SIDESLOPES AS REQUIRED TO CATCH WITHIN THE EXISTING EMBANKMENT BUT NOT STEEPER THE 1H : 4V.
 4. APPLY 1.5 LBS CALCIUM CHLORIDE PER SQUARE YARD OF FINISHED ROADWAY, AS SPECIFIED.

POINT AND CURVE TABLE - RECONSTRUCT AT SS016

POINT	NORTHING	EASTING	ELEV	REMARK
20	3925640.0976	1806590.6835	MATCH EG	PT
21	3925640.8925	1806606.8474	MATCH EG	PC
22	3925645.5058	1806652.4852	MATCH EG	R = 200 FT
23	3925654.1121	1806682.2979	MATCH EG	PT
24	3925665.3587	1806678.085	MATCH EG	PC
25	3925655.7447	1806643.6542	MATCH EG	R = 188 FT
26	3925652.8295	1806607.8366	MATCH EG	PT
27	3925652.0884	1806590.1027	MATCH EG	PT



- GENERAL NOTES**
1. THERE IS NO TOPOGRAPHIC SURVEY FOR SITE SS016. ESTABLISH EXISTING GRADE PRIOR TO EXCAVATION AS REQUIRED TO RECONSTRUCT THE ROAD TO THE ORIGINAL GRADE AND CROSS SLOPE.

BY: R. THOMPSON
 REVISION: J. TRACY
 CHK: J. TAYLOR
 DR: J. TAYLOR
 NO. DATE
 DSGN

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EXCAVATION AT SITES SS014 & SS016 & SS017
 CIVIL
 ROAD RECONSTRUCTION &
 GRADING PLAN

VERIFY SCALE
 BAR IS ONE INCH ON ORIGINAL DRAWING.
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DATE: JULY 13, 2011
 PROJ: 408222
 DWG: C-10
 SHEET: 15

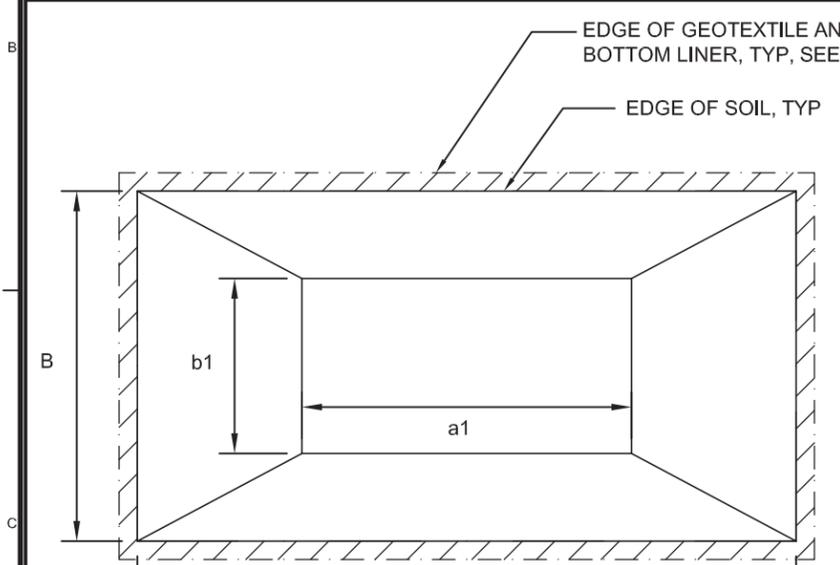
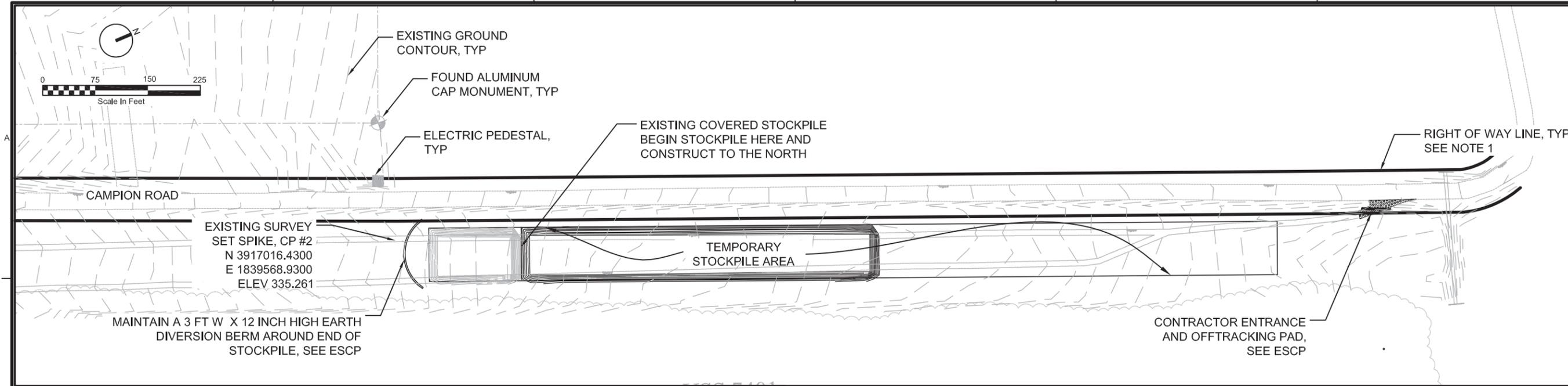


NO.	DATE	DR	REVISION	CHK	BY	APVD
		J. TAYLOR	J. TAYLOR	J. TRACY	R. THOMPSON	

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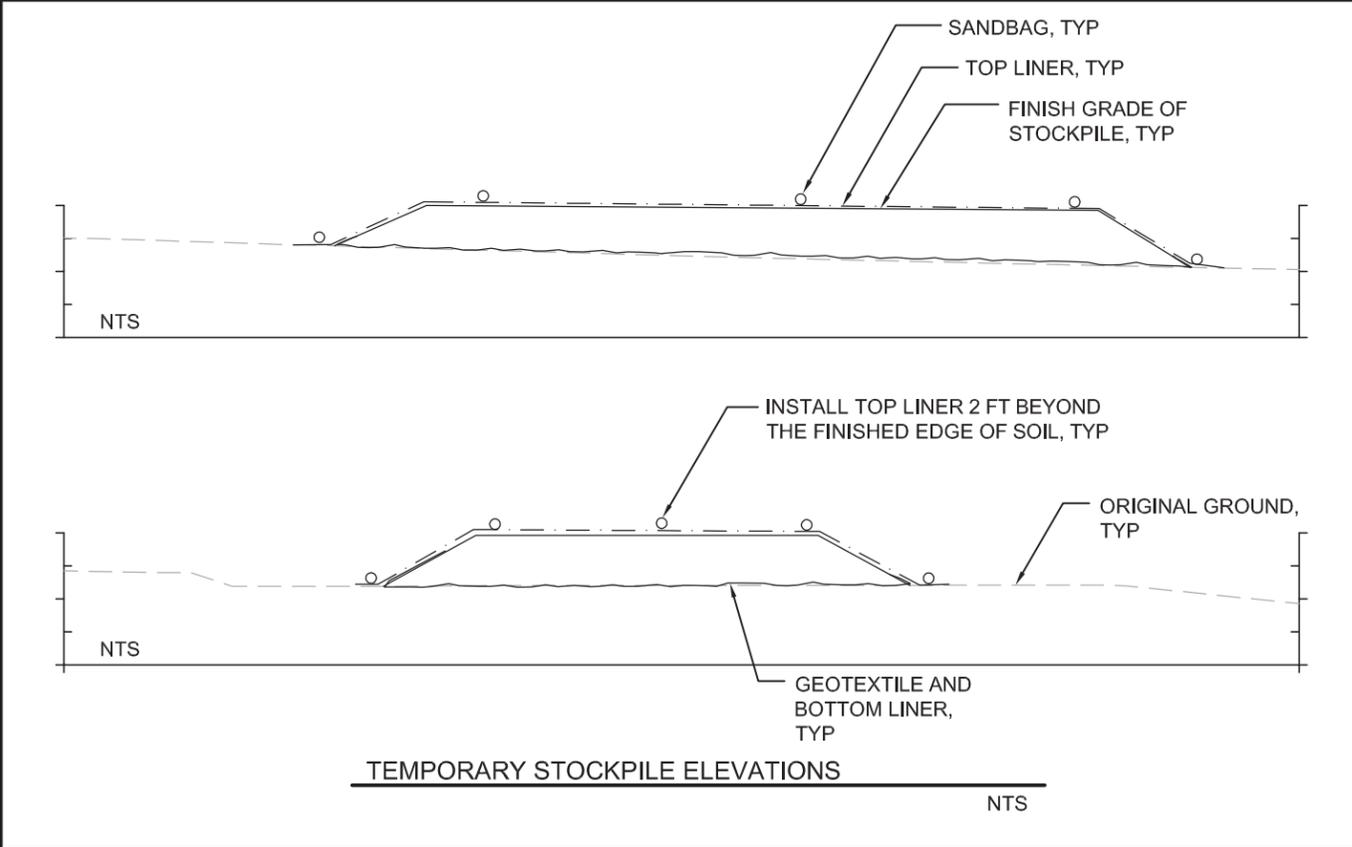
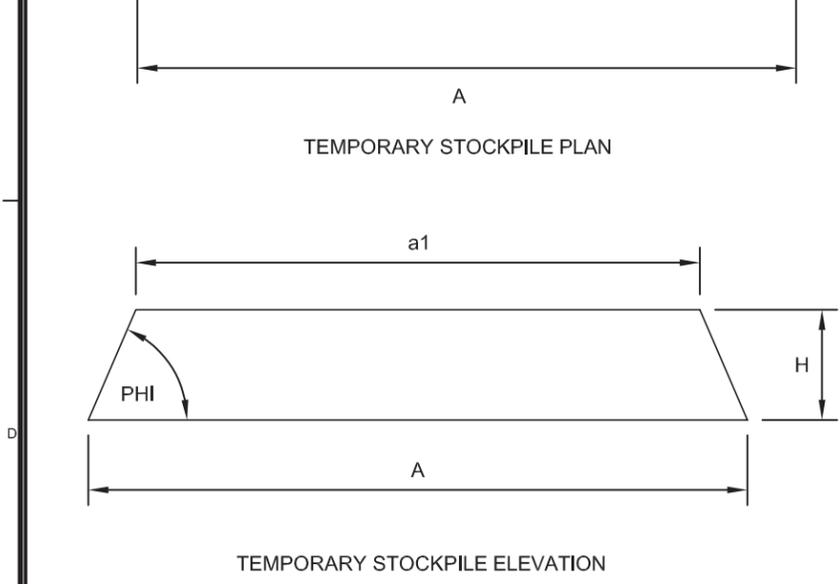
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 EXCAVATION AT SITES SS014 & SS016 & SS017
 CIVIL
 TEMPORARY STOCKPILE PLAN

DATE	JULY 13, 2011
PROJ	408222
DWG	C-11
SHEET	16



TEMPORARY STOCKPILE PLAN		
POINT	DIMENSION	REMARK
A	500 FT	EDGE OF SOIL
a1	475 FT	EDGE OF SOIL
B	80 FT	EDGE OF SOIL
b1	52 FT	EDGE OF SOIL
PHI	27 °	2H : 1V
H	7 FT	-

- NOTES:
1. CONSTRUCT BOTTOM LINER AND GEOTEXTILE 10 FT BEYOND THE EDGE OF SOIL LIMITS, AS SPECIFIED
 2. WRAP BOTTOM LINER UP STOCKPILE PRIOR TO PLACING TOPCOVER, PIN LINER TO STOCKPILE.



- GENERAL NOTES
1. RIGHT OF WAY LINE IS APPROX 20 FT FROM EDGE OF ROAD. PROVIDE 10 FEET BETWEEN RIGHT OF WAY LINE AND FINISHED EDGE OF THE STOCKPILE
 2. THE STOCKPILE AREA HAS BEEN GRUBBED OF ALL VEGETATION AND CONSISTS OF SOFT SANDS AND SILTS. PROVIDE AND PLACE EARTH MATERIALS AS REQUIRED TO ACCOMODATE CONSTRUCTION EQUIPMENT, REFER TO CONTRACT SCOPE OF WORK.
 3. BRING STOCKPILE TO FINISHED GRADE DAILY. PLACE OWNER FURNISHED TOP LINER OVER FINISHED STOCKPILE AT LEAST DAILY. MANAGE CONSTRUCTION SO AS TO MINIMIZE THE PILE EXPOSURE TO WIND OR RAIN.
 4. SECURE TOPLINER WITH SANDBAGS TO PREVENT LINER DISPLACEMENT FROM WIND. USE ROPE IF REQUIRED.
 5. CONSTRUCT OWNER FURNISHED BOTTOM LINER AND GEOTEXTILE AS SPECIFIED

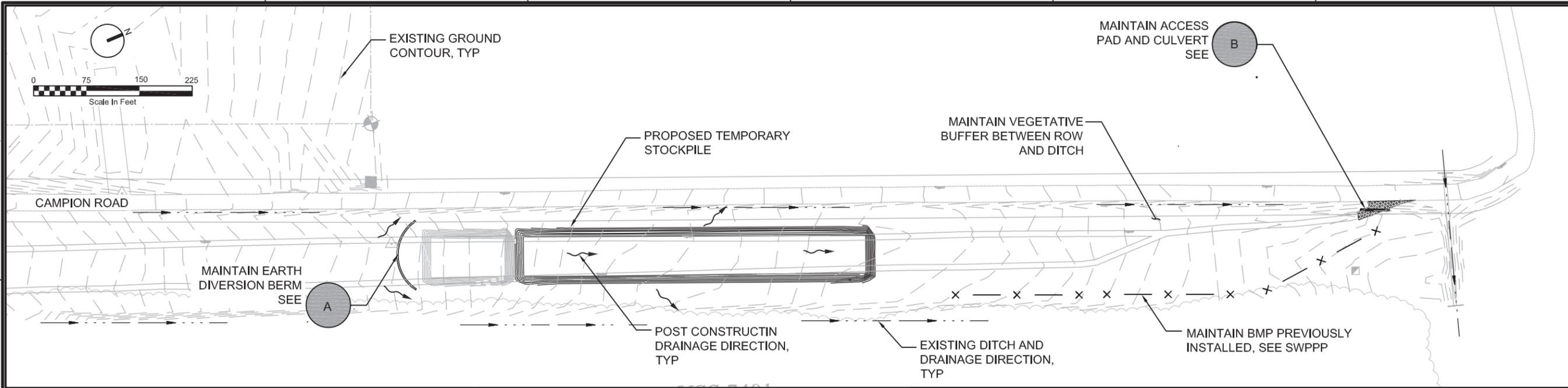


NO.	DATE	DR	REVISION	BY
1		J. TAYLOR	CHK	J. TRACY
2		J. TAYLOR	DR	R. THOMPSON

NO.	DATE	DR	REVISION	BY
1		J. TAYLOR	CHK	J. TRACY
2		J. TAYLOR	DR	R. THOMPSON

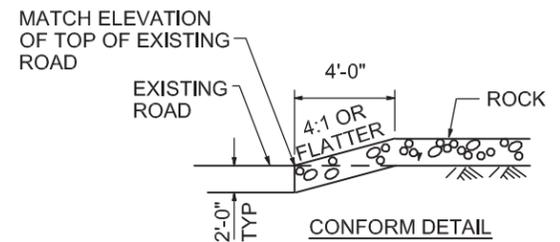
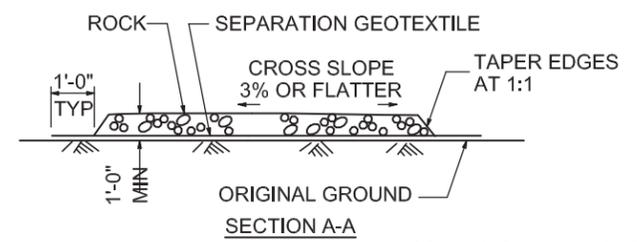
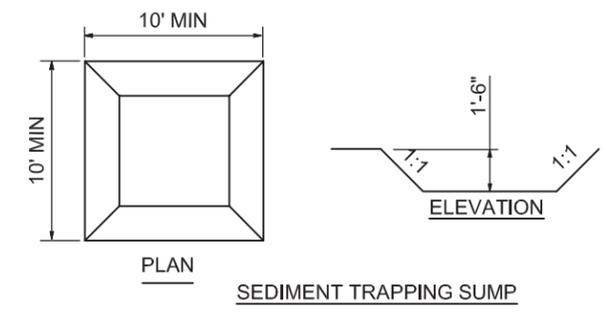
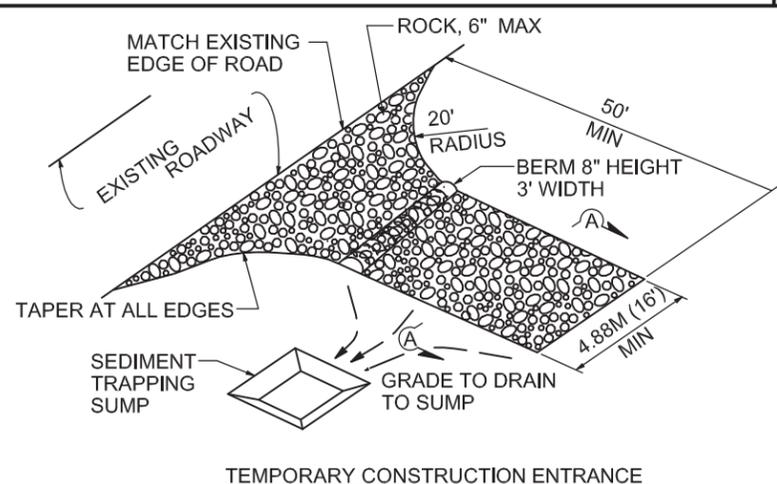
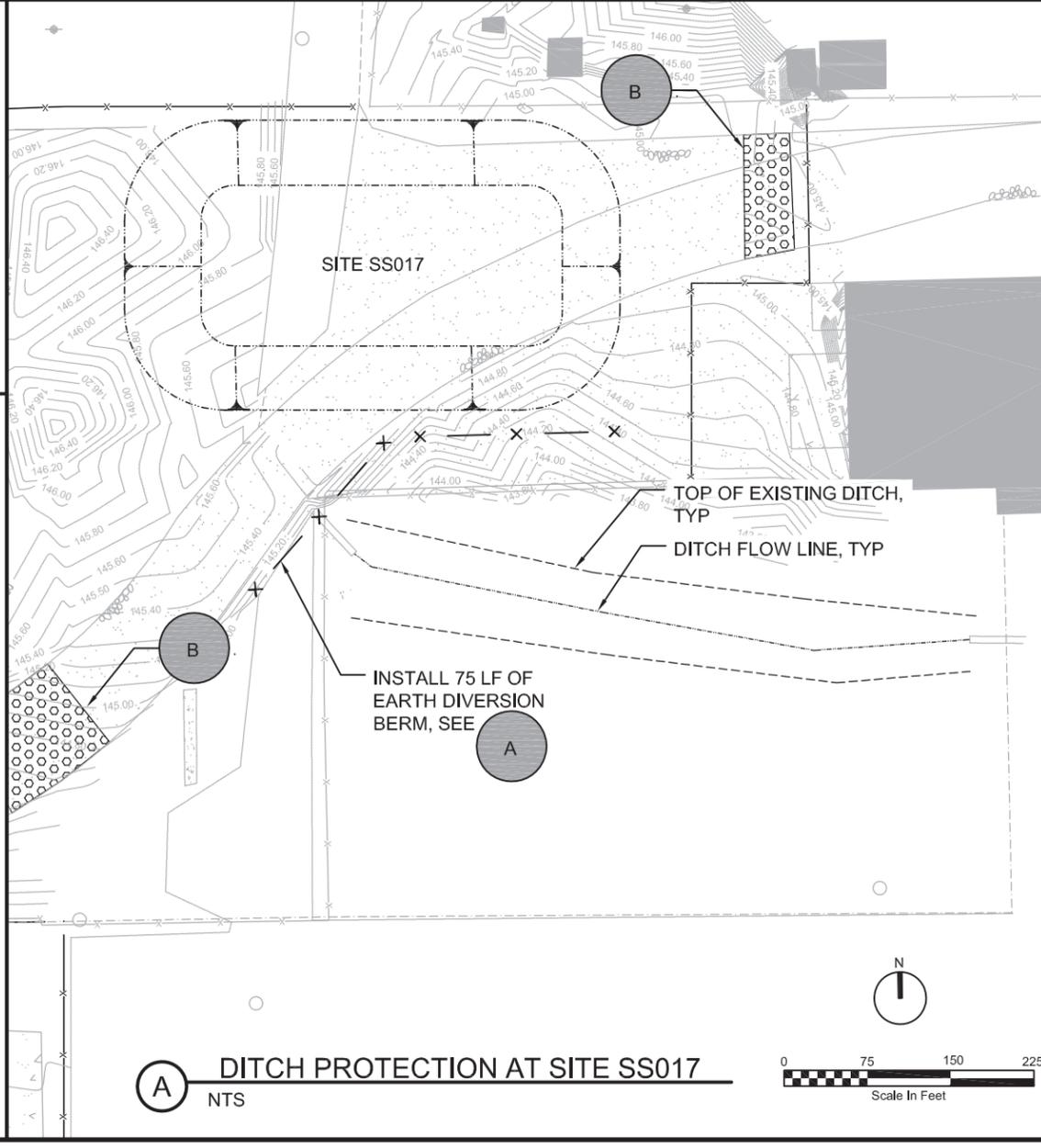
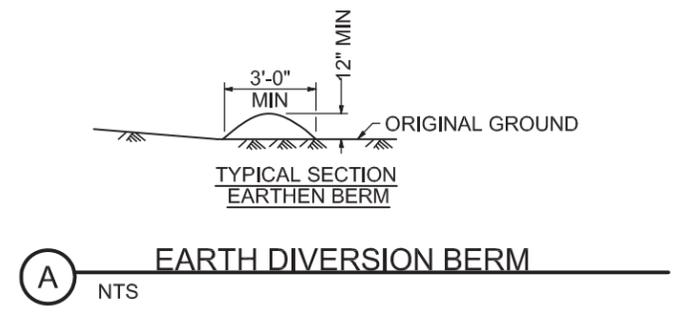
CH2MHILL
 EXCAVATION AT SITES SS014 & SS016 & SS017
 CIVIL
 EROSION AND SEDIMENT CONTROL PLAN (ESCP)

DATE	JULY 13, 2011
PROJ	408222
DWG	C-12
SHEET	17



GENERAL NOTES

1. CONTRACTOR ENTRANCE DETAIL APPLIES AT ALL LOCATIONS WHERE AN OFFTRACKING PAD IS SHOWN ON THE PLANS.
2. MAINTAIN BMP'S PREVIOUSLY INSTALLED BY OTHERS.
3. THIS ESCP SUPPLEMENTS THE SWPPP PROVIDED IN THE CONTRACT DOCUMENTS. COMPLY WITH ALL REQUIREMENTS SET FORTH IN THE SWPPP FOR STORM WATER MANAGEMENT.



B GRAVEL CONSTRUCTION ENTRANCE DETAIL
 NTS

A DITCH PROTECTION AT SITE SS017
 NTS



Appendix D
Standard Operating Procedures

SOP-33

Contaminated Soil Transport

SOP-33: CONTAMINATED SOIL TRANSPORT

1.0 Purpose

This standard operating procedure (SOP) provides programmatic criteria for the transport of contaminated soil.

2.0 Scope

This procedure applies to all CH2M HILL personnel and subcontractors engaged in transporting contaminated soil during Former Galena Forward Operation Location (FOL) project tasks.

The field documentation will be recorded in accordance with the following Alaska Department of Environmental Conservation (ADEC) guidance document (*Alaska Administrative Code* (AAC)):

- 18 AAC 60, *Solid Waste Management* (ADEC, September 2010)

Should field tasks and procedures be added to a project that are not included in this SOP, they must be defined in Appendix H (*Work Plan for Site Inspection, Remedial Investigation, and Site Characterization, Former Galena Forward Operating Location, Alaska* [CH2M HILL, August 2010]), Field Standard Operation Procedures, or Appendix A, Project-specific Health and Safety Plan (HSP) (Appendix A, *Work Plan for Site Inspection, Remedial Investigation, and Site Characterization, Former Galena Forward Operating Location, Alaska* [CH2M HILL, August 2010]), before implementation. Changes to field procedures and equipment should be implemented and documented in accordance with SOP-20 (*Field Procedure Change Management*).

3.0 General

This SOP describes the methods to be used for the transport of contaminated soil from excavations, stockpiles, landfarm treatment facilities, or other facilities. Soil will be transported to either a long-term stockpile, treatment facility, or final disposition location approved by ADEC.

4.0 Materials and Equipment

The following materials and equipment will be needed for the transport of contaminated soil:

- Manifest or bill of lading
- Soil cover material (plastic)
- Field notebooks
- ADEC Contaminated Soil Transport and Treatment Approval Form (Attachment 1 to this SOP [ADEC, November 2009])

5.0 Responsibilities

5.1 Safety Coordinator

The role of Safety Coordinator (SC) is either taken by the Field Manager (FM) or is designated to Field Team Leaders (FTL) by the FM, to assist in implementing the project HSP. The SC assists the FM and Health and Safety Manager (HSM) with the health and safety program, implements the personal protective equipment (PPE) requirements described in the project HSP, and receives input from project staff that the assigned PPE requirements and ongoing health, safety, and environment (HS&E) procedures are effective.

5.2 Field Team Leader

Each FTL, in conjunction with the SC, is responsible for overall compliance with contaminated soil transport. The FTL is responsible for following these procedures or delegating tasks to team members to perform tasks. The FTL should verify that subcontractors are adequately complying with this procedure.

6.0 Procedure

The following procedures must be followed when transporting soil:

1. Send soil analytical results and a completed Contaminated Soil Transport and Treatment Approval Form to ADEC for their approval.
2. Receive ADEC approval prior to transport.
3. Forward a copy of ADEC approval to the receiving entities with an expected transport date and obtain receiving entities' approval for transport and receipt of the contaminated soil.
4. Provide completed shipping document (manifest or bill of lading) to transporter with appropriate designation.
5. Inspect trucks prior to loading to ensure no residual contamination and that trucks are in good condition. Inspect trucks and decontaminate if necessary after loading to ensure no soil is on wheels or sides of truck.
6. Transport soil by main roadways as a covered load in compliance with 18 AAC 60.015 (ADEC, September 2010, 18 AAC 60).
7. If soil is spilled during transport, the soil and any residue resulting from the spill will be promptly picked up, and the incident reported to ADEC (ADEC, September 2010, 18 AAC 60).
8. Document date and time soil was delivered on the manifest or bill of lading, and have the receiver sign for receipt.
9. After soil transport is complete, provide to ADEC: (a) estimated quantities of soil transported under the approved Contaminated Soil Transport and Treatment Approval Form, and (b) copy of the manifest or bill of lading.

7.0 Document Control

At the conclusion of a transport task, ADEC Contaminated Soil Transport and Treatment Approval Forms will be submitted to ADEC for records retention.

Project files will be maintained by the Project Manager, FM, or designee. Documents will be securely kept in the project files and electronically.

8.0 Records

Documentation should follow all guidelines contained in this technical procedure (ADEC Contaminated Soil Transport and Treatment Approval Form).

9.0 References

Alaska Department of Environmental Conservation (ADEC). September 2010.
18 AAC 60, Solid Waste Management.

Alaska Department of Environmental Conservation (ADEC). November 2009.
Contaminated Soil Transport and Treatment Approval Form. Division of Spill Prevention and Response, Contaminated Sites Program.

CH2M HILL. August 2010. *Work Plan for Site Inspection, Remedial Investigation, and Site Characterization, Former Galena Forward Operating Location, Alaska.*
Final. Prepared for the Air Force Center for Engineering and the Environment.

10.0 Attachments

Attachment 1, *ADEC Contaminated Soil Transport and Treatment Approval Form*

ATTACHMENT 1

*ADEC Contaminated Soil Transport and
Treatment Approval Form*



**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites Program**

Contaminated Soil Transport and Treatment Approval Form

DEC HAZARD ID #		NAME OF CONTAMINATED SITE	
SPILL LOCATION			
CONTAMINATED SOIL'S CURRENT LOCATION		SOURCE OF THE CONTAMINATION	
TYPE OF CONTAMINATION	ESTIMATED VOLUME	DATE(S) STOCKPILE GENERATED	
POST TREATMENT ANALYSIS REQUIRED <i>(such as GRO, DRO, RRO, BTEX, and/or Chlorinated Solvents)</i>			
COMMENTS			

Facility Accepting the Contaminated Soil

NAME OF THE FACILITY	ADDRESS/PHONE NUMBER

Responsible Party and Contractor Information

BUSINESS/NAME	ADDRESS/PHONE NUMBER

Name of the Person Requesting Approval (printed)

Title/Association

Signature

Date

Phone Number

-----**DEC USE ONLY**-----

Based on the information provided, ADEC approves transport of the above mentioned material for treatment in accordance with the approved facility operations plan. The Responsible Party or their consultant must submit to the DEC Project Manager a copy of weight receipts of the loads transported to the facility and a post treatment analytical report. The contaminated soil shall be transported as a covered load in compliance with 18 AAC 60.015.

DEC Project Manager Name (printed)

Project Manager Title

Signature

Date

Phone Number

SOP-34

Soil Storage

SOP-34: SOIL STORAGE

1.0 Purpose

This standard operating procedure (SOP) establishes requirements and methods for safely storing contaminated soil in the short term (fewer than 180 days) and long term (180 days to 2 years). This SOP does not describe practices for temporary (fewer than 14 days) storage of contaminated soil.

2.0 Scope

This procedure applies to all CH2M HILL personnel and subcontractors engaged in soil handling and storage in support of the Air Force Center for Engineering and the Environment (AFCEE) Former Galena Forward Operating Location (FOL) project.

All soil storage activities will be conducted in accordance with the Alaska Department of Environmental Conservation's (ADEC) requirements established under Title 18, Chapter 75, Article 3, Section 370 (*Soil storage and disposal*) of the *Alaska Administrative Code* (18 AAC 75.370) (ADEC, October 2008). This SOP is to be used in conjunction with the project-specific Health and Safety Plan (HSP) (Appendix A, *Work Plan for Site Inspection, Remedial Investigation, and Site Characterization, Former Galena Forward Operating Location, Alaska* [CH2M HILL, August 2010]). Depending on project tasks, this SOP may be used in conjunction with other applicable project SOPs (Appendix H, *Work Plan for Site Inspection, Remedial Investigation, and Site Characterization, Former Galena Forward Operating Location, Alaska*), including the following:

- SOP-01, *Note Taking and Field Log Books*
- SOP-04, *Organic Vapor Monitoring and Air Monitoring*
- SOP-14, *Equipment Decontamination Procedures*
- SOP-23, *Soil Excavation and Confirmation Sampling*
- SOP-29, *Test Pit Excavation and Sampling*

3.0 General

Contaminated soil may be generated at any time during the Former Galena FOL project. This contaminated soil may require storage in the short or long term, depending on the soil's final disposition. It is vital that contaminated soil be segregated as it is generated and stored according to (1) the intended cleanup actions and (2) the specific hazardous substance present.

The contaminated soil must be placed on a liner or on or within another impermeable surface that prevents soil and groundwater beneath and adjacent to the liner from being contaminated. The liner must be compatible with the type of hazardous substance being stored. The soil stockpile must be covered and protected from weather with the top cover overlapping the liner to prevent water from running through the soil. The stockpile must be inspected and maintained regularly to ensure that the cover remains intact and that any leachate derived from the soil is contained.

4.0 Responsibilities

4.1 Project Manager

The Project Manager is responsible for providing adequate resources and verifying that field staff have adequate experience and training to successfully comply with and execute project-specific SOPs and implement the project health, safety, and environment (HS&E) program.

4.2 Field Manager

The Field Manager (FM) is responsible for coordinating and scheduling daily field activities. In addition, the FM is responsible for verifying compliance with this SOP and confirming that all field staff engaged in this activity have been trained in this SOP.

4.3 Field Team Leader

The Field Team Leader (FTL) should develop or direct the preparation of the stockpile, particularly the procedures to be used. The FTL or their designee will be familiar with the requirements of this SOP and project-specific work plan(s) for stockpile creation and should maintain adequate documentation of its construction.

4.4 Health and Safety Manager

The Health and Safety Manager (HSM) is assigned to oversee site-specific HS&E matters and verify overall compliance with project HS&E requirements. The HSM conducts personal protective equipment (PPE) evaluations, selects the appropriate PPE for the project, lists the requirements in the project-specific HSP (Appendix A), coordinates with the FM and Safety Coordinator (SC) to complete and certify the PPE program, and conducts project health and safety audits on the effectiveness of the HS&E program.

4.5 Safety Coordinator

The role of SC is either taken by the FM or is designated to FTLs by the FM to assist in implementing the project HSP. The SC assists the FM and HSM with the health and safety program, implements the PPE requirements described in the project HSP, and receives input from project staff that the assigned PPE requirements and ongoing HS&E procedures are effective.

5.0 Procedures

The consideration and procedures for constructing a soil stockpile include the following tasks.

5.1 Select Stockpile Location

The preferred stockpile location will be relatively close to the excavation area to minimize hauling distance. The site must also meet the following minimum setback requirements from surface water and water supply sources as specified by ADEC regulations:

1. At least 100 feet from a surface water body, a private water system, a Class C public water system, or a freshwater supply system that uses groundwater
2. At least 200 feet from a water source serving a Class A or Class B public water system

Although not specifically regulated, consideration should also be given in locating a stockpile in proximity to above- and belowground utilities, fences, streets, buildings, and other potential surface and subsurface features.

5.2 Stockpile Design Considerations

Several stockpile configurations can be considered depending on the stockpile location and duration, the nature of the material in the stockpile, and the ground slope at the stockpile location. Typical soil stockpile configurations (options) are schematically shown on Figures 1 through 3 (located at the end of this SOP). Figure 1 is applicable when the ground surface adjacent to the stockpile slopes naturally or is mechanically graded away from the stockpile to prevent surface water from entering the stockpile between the bottom liner and top cover. Figures 2 and 3 are applicable when the ground surface is relatively flat or gently slopes toward the stockpile. Figure 3 is preferable when the contaminated soil in the stockpile is very wet and the potential exists for water to drain out of the soil. No leachate is expected from soils excavated from Galena, so no leachate system is designed in these stockpiles.

5.3 Stockpile Bottom Liner Specifications

Specifications for stockpile liner materials are dependent on the length of time that the soil will be stored. Short-term stockpiling requirements apply to periods of fewer than 180 days, and long-term stockpiling requirements apply to periods of 180 days to 2 years.

Table 1 summarizes stockpile bottom liner requirements for petroleum-contaminated soil (and other compatible hazardous substances).

Whenever possible, liner panels should be seamed at the liner fabricator's shop prior to shipment to the construction site to minimize field seams. Field seams must be performed in accordance with the liner manufacturer's recommendations. If sufficient ground slope exists at the stockpile location (typically >1 percent), the bottom liner panels can be overlapped or "shingled" rather than fusion welded, as shown on Figure 4.

5.4 Stockpile Construction

The process for constructing a soil stockpile includes the following tasks:

- Prepare the foundation layer. Clear and grub the stockpile area to remove roots, rocks, and other sharp objects that may potentially puncture the bottom liner. For Option 3 (see Figure 3), a soil berm typically 2 feet high is placed near the inside edge of the stockpile area to prevent surface water from entering or leachate from leaving the stockpile. Sand or a cushioning nonwoven geotextile material may be required on the subgrade to provide a suitable foundation.
- The bottom liner is then placed over the prepared foundation (and soil berm if Option 3 is used).
- Depending on the nature of the soil to be placed in the stockpile, an inner geotextile or sand layer may be required as a protective surface over the liner. Approximately 3 inches of clean sand or an additional layer of thick geotextile placed on top of the bottom liner will protect it from rocks within the stockpile and heavy equipment used to place the contaminated soil. The clean sand or geotextile also minimizes the tracking of contaminated soils off the stockpile area.

- Stockpile soil in a manner to prevent surface ponding and to promote drainage away from the contaminated soil. The stockpiled soil will be covered at the end of each work day, or if it is raining or snowing, or if strong winds are blowing.
- Cover the stockpile with a minimum 10-mil, polyethylene cover or equivalent. (Note: 18 AAC 75.375 allows the use of minimum 6-mil polyethylene cover. However, 10-mil material is required in this SOP). The edges will be lapped over the bottom liner to prevent precipitation and surface runoff from entering the stockpile. For Option 2 (see Figure 2), wrap the bottom liner up the stockpile side slope and secure with pins or rope, as shown on Figure 2, prior to placing and securing the top cover. The top cover dimensions are larger than the bottom liner footprint and must be calculated by using the area of the bottom liner and the height and configuration of the stockpiled soil.
- Secure the top cover by placing sandbags or tires interconnected by rope on top of the cover and along the toe of the stockpile to minimize movement in the wind.
- It is imperative that the bottom liner and top cover are undamaged during installation and soil placement. If either the liner or top cover is damaged, it must be repaired following the liner manufacturer's requirements to ensure that it maintains its structural integrity and water tightness.

5.5 Maintenance

The stockpile should be inspected daily while material is being placed in the stockpile, then monthly or after any severe weather events to ensure that the cover is secure and sandbags are in place. Inspect the cover for tears and repair if necessary in accordance with the cover manufacturer's requirements.

6.0 Records

The following records are to be maintained in the project file and onsite during work activities: notes, photographs, daily diaries, and as-built drawings of the stockpile's location and dimensions and materials used in its construction.

TABLE 1
Bottom Liner Specifications for Soil Stockpiling

Specification Method	Short-term Liner Requirement	Long-term Liner Requirement
Coated Fabric Liners		
Cold Crack (ASTM D2136-02, July 2007)	-60° F	-60° F
Black Carbon Content (ASTM D1603-06, March 2006)	2 percent or greater	2 percent or greater
Tensile Strength (ASTM D751-06, May 2006)	125 pounds (warp)	300 pounds (warp)
Mullen Burst (ASTM D751-06, May 2006)	250 pounds per square inch	500 pounds per square inch
Nominal Thickness	10 mil	20 mil

TABLE 1
Bottom Liner Specifications for Soil Stockpiling

Specification Method	Short-term Liner Requirement	Long-term Liner Requirement
Oil Resistance (ASTM D471-06, November 2006)	No signs of deterioration and more than 80 percent retention of tensile and seam strength after immersion for 30 days at 73° F	No signs of deterioration and more than 80 percent retention of tensile and seam strength after immersion for 30 days at 73° F
Extruded Fabric Liners		
Cold Crack (ASTM D2136-02, July 2007)	-60° F	-60° F
Black Carbon Content (ASTM D1603-06, March 2006)	2 percent or greater	2 percent or greater
1-inch Tensile Strength (ASTM D882-02, June 2002)	25 pounds (warp)	45 pounds (warp)
1-inch Elongation Machine Direction	550 percent	625 percent
Nominal Thickness	10 mil	20 mil
Oil Resistance (ASTM D471-06, November 2006)	No signs of deterioration and more than 80 percent retention of tensile and seam strength after immersion for 30 days at 73° F	No signs of deterioration and more than 80 percent retention of tensile and seam strength after immersion for 30 days at 73° F

Notes:

ASTM = American Society for Testing and Materials International

° F = degrees Fahrenheit

Source: Title 18, Chapter 75, Article 3, Section 370, Table D of the AAC

7.0 References

Alaska Department of Environmental Conservation (ADEC). October 9, 2008. 18 AAC 75, *Oil and Other Hazardous Substances Pollution Control*.

CH2M HILL. August 2010. *Work Plan for Site Inspection, Remedial Investigation, and Site Characterization, Former Galena Forward Operating Location, Alaska*. Final. Prepared for the Air Force Center for Engineering and the Environment.

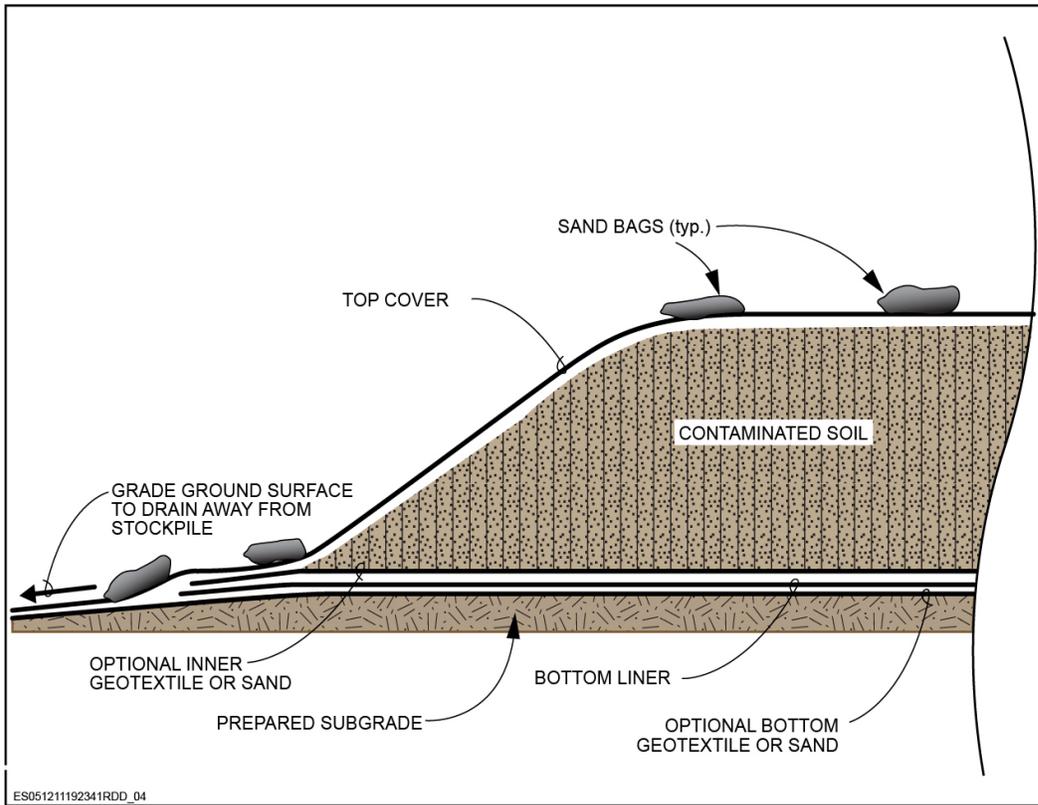


FIGURE 1
Option 1 Liner/Cover Configuration

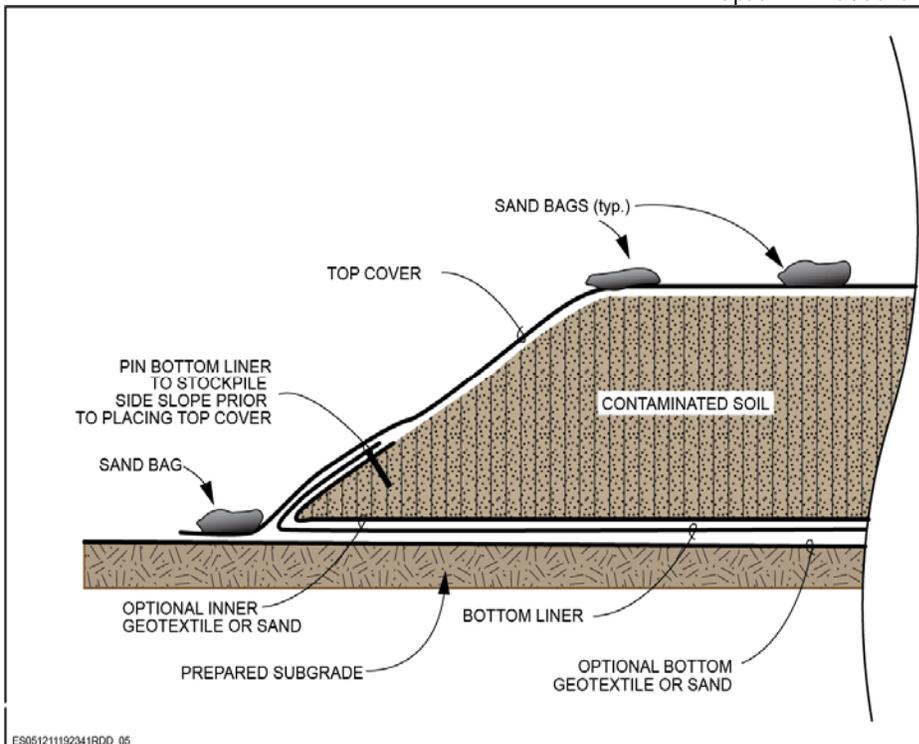


FIGURE 2
Option 2 Liner/Cover Configuration

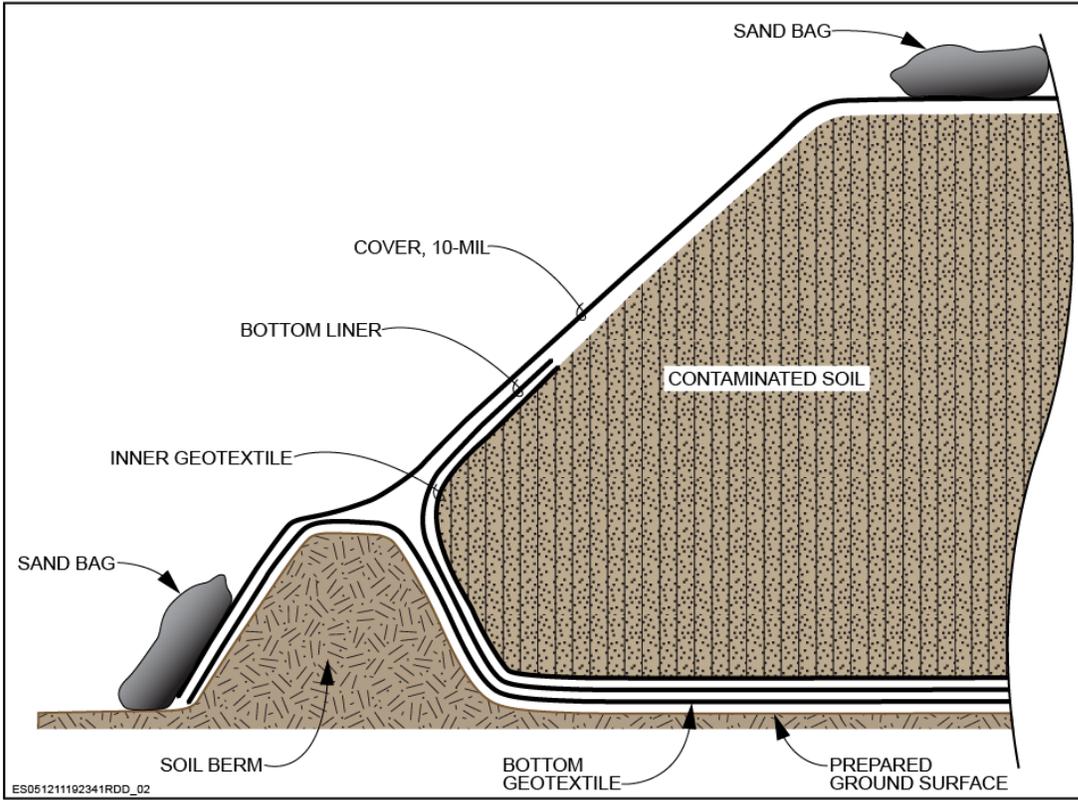


FIGURE 3
Option 3 Liner/Cover Configuration

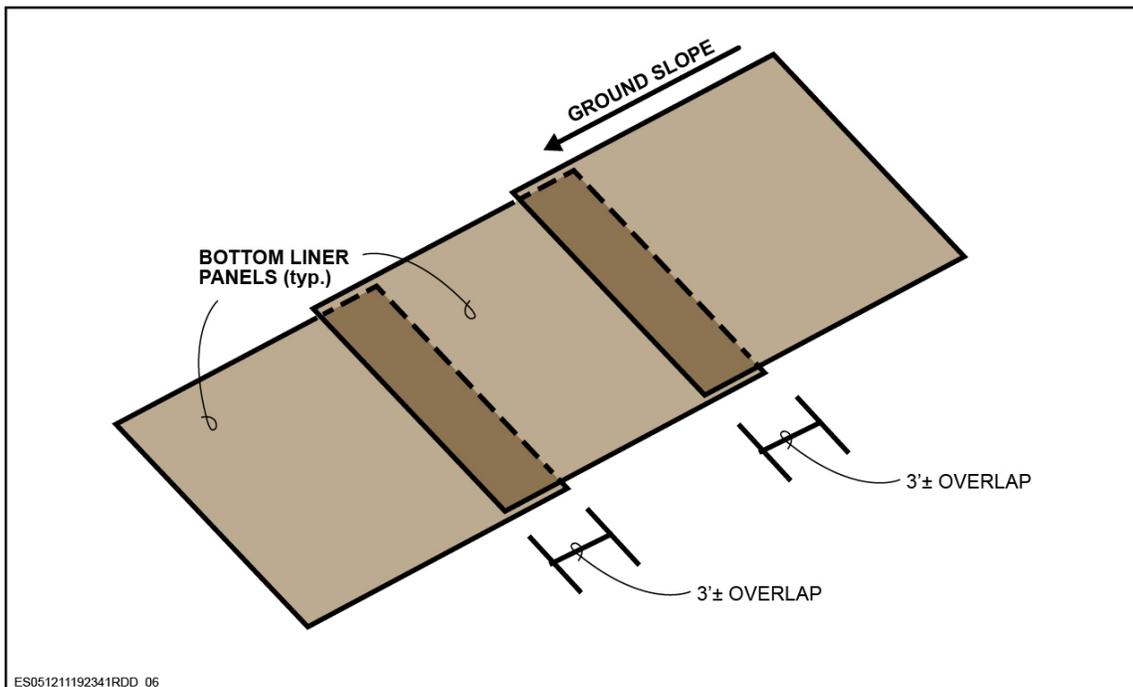


FIGURE 4
Shingling Bottom Liner Panels

Appendix E
IRA Field Sampling Plan

Interim Removal Action Field Sampling Plan

This field sampling plan (FSP) describes post-excavation soil sampling and surveying details as part of the Interim Removal Action (IRA) for Sites SS014, SS017 (Site 14/17), SS016, SS005, and AST1569 at the Former Galena Forward Operating Location (FOL) in Galena, Alaska.

Soil sampling and surveying will be completed using applicable standard operating procedures (SOP) described in the *Work Plan for Site Inspection, Remedial Investigation, and Site Characterization, Former Galena Forward Operating Location, Alaska* (CH2M HILL, August 2010) (Work Plan).

Field Activities

Documentation Sampling

Soil samples will be collected from the floor and sidewalls of the excavations at Sites 14/17 and SS016 to determine the remaining soil contamination. Documentation samples are not intended to show that all contaminated soil was excavated, because it will not all be excavated. The data collected from the excavations will supplement data previously collected in soil borings below and adjacent to the excavated areas. Because the purpose of the sampling is not to confirm cleanup, and because the source delineation and site characterization sampling will provide additional data, the sampling design (that is, the number of soil samples to be collected and the sample location spacing) was modified from the requirements and recommendations in 18 Alaska Administrative Code (AAC) 78 and the Alaska Department of Environmental Conservation (ADEC) *Draft Field Sampling Guidance* (ADEC, May 2010) to be appropriate for the site.

After completing the excavation and before backfilling, each soil sample location and the extent of excavation will be horizontally and vertically surveyed.

Confirmation Sampling

Soil samples will be collected from the floor and sidewalls of the excavations at Sites SS005 and AST1569 to confirm sufficient soil has been removed and soil contamination levels are below Method Two cleanup levels. The data collected from the excavations will supplement data previously collected in soil borings below and adjacent to the excavated areas. The sampling design meets the requirements and recommendations under 18 AAC 78 and the ADEC *Draft Field Sampling Guidance* (ADEC, 2010) for the quantity of excavation samples collected.

After completing the excavation and before backfilling, each soil sample location and the extent of excavation will be horizontally and vertically surveyed.

Pre-sampling Activities

Before field activities begin, staff will review work planning documentation (including SOPs and internal Health, Safety, & Environment information) and will confirm that materials and equipment identified in the SOPs have been procured. Records will be maintained consistent with SOP-01 (*Note Taking and Field Log Books*). Because utility clearances will have been obtained in accordance with SOP-03 (*Utility Clearance for Intrusive Operations*) prior to the excavation, and documentation sampling will not require any intrusive activity beyond the surface of the excavation (floor or sidewall), no additional utility clearance is required.

Field Investigation Tasks

Documentation Soil Sampling

Soil samples will be collected after excavation activities have been completed in an area and before the excavation area is backfilled. Table E-1 summarizes the sampling frequency, purpose, sample type, number of samples, and analyses for documentation sampling. Table E-2 presents the sampling plan details and rationale for the documentation sampling.

At a minimum, two soil samples will be collected from the floor of each excavation up to a surface area of 1,000 square feet (ft²); then one additional sample will be collected for each additional 1,000 ft² of excavation floor area, or portion thereof over the initial 1,000 ft², at points where contamination is most likely to be present. For example, in an excavation that has a total floor area of 5,030 ft², a total of seven samples would be collected. Soil samples will also be collected from the walls of each excavation. At a minimum, one soil sample will be collected from each wall of the excavation or a frequency of one per 50 linear feet of excavation perimeter (as an excavation “wall” may be difficult to define), whichever is greater. For example, in an excavation that has an estimated perimeter of 390 feet, eight soil samples would be collected from the excavation walls. Soil sampling will be collected in accordance with the Work Plan (CH2M HILL, August 2010) and SOP-7 (*Surface and Subsurface Soil Sampling*), specifically Section 5.6.1, Excavation Sampling.

Confirmation Soil Sampling

Soil samples will be collected after excavation activities have been completed in an excavation area and before the area is backfilled. Table E-3 summarizes the sampling frequency, purpose, sample type, number of samples, and analyses for confirmation sampling. Table E-4 presents the sampling plan details and rationale for the confirmation sampling.

Samples will be collected and screened for contamination in the field using a photo-ionization detector (PID) or flame ionization detector (FID). A minimum of 10 screening samples will be collected from the floor of each excavation up to a surface area of 250 ft²; then one additional sample will be collected for each additional 100 ft² of excavation floor area, or portion thereof over the initial 250 ft². For example, assuming the proposed total excavation floor is 1,730 ft², a total of 25 screening samples would be collected. Soil screening samples will also be collected from the walls of each excavation. At a minimum, one soil screening sample per 10 linear feet, or portion thereof, will be collected from each wall of the excavation. For example, if the excavation has an estimated perimeter of 270 feet, then 27 soil screening samples would be collected from the excavation walls.

Samples will also be collected for laboratory analysis as shown in Table E-4. At a minimum, two soil samples will be collected from the floor of each excavation up to a surface area of 250 ft²; then one additional sample will be collected for each additional 250 ft² of excavation floor area, or portion thereof over the initial 250 ft², at points where contamination is most likely to be present. For example, if a proposed total floor area at the excavation is 1,730 ft², a total of 8 samples would be collected. Soil samples will also be collected from the walls of each excavation. At a minimum, one soil sample will be collected from each wall of the excavation or a frequency of one per 20 linear feet of excavation perimeter (as an excavation "wall" may be difficult to define), whichever is greater. In the above example, if the sidewall has an estimated perimeter of 270 feet, 14 soil samples would be collected from the excavation walls. Soil sampling will be collected in accordance with the Work Plan (CH2M HILL, August 2010) and SOP-7 (*Surface and Subsurface Soil Sampling*), specifically Section 5.6.1, Excavation Sampling.

Soil Sample Analysis

The samples will be analyzed for volatile organic compounds (VOC), gasoline-range organics (GRO), diesel-range organics (DRO)/residual-range organics (RRO) by Methods SW8260B, AK101, and AK102/ AK103, respectively. Ten percent of the samples will also be analyzed for polynuclear aromatic hydrocarbons (PAH) by SW8270C SIM.

Laboratory methods, bottle requirements, field preservation requirements, and sample volumes for these analyses are provided in Worksheet #19 of the Work Plan. Quality assurance (QA)/quality control (QC) samples will be collected as specified in Tables E-2 and E-4 and in Worksheet #20 of the Work Plan. Sample handling procedures will follow SOP-18 (*Packing and Shipping of Environmental Samples*) and SOP-19 (*Sample Handling, Identification, and Custody*).

Surveying

The perimeter edge (crest) at ground surface, the excavation toe, and the floor surface will be surveyed to determine the extent of contaminated soil removed during the excavation. The following general site survey standards will be applied. Survey data for this site will be horizontally accurate to the nearest 0.1 foot, and elevations will be accurate to the nearest 0.1 foot or greater. Final survey data will be processed and presented in Alaska State Plane Zone 6, NAD83 Datum.

To achieve the required accuracy, sample locations and the extent of excavation will be surveyed for horizontal position and vertical elevation by a certified or licensed land surveyor in accordance with SOP-17 (*Geographic Land Surveying*).

Equipment Calibration

The field PID will be calibrated in accordance with SOP-04 (*Organic Vapor Monitoring and Air Monitoring*).

Equipment Decontamination

Non-dedicated equipment will be decontaminated in accordance with SOP-14 (*Equipment Decontamination Procedures*).

Investigation-derived Waste Management

Investigation-derived waste will be minimal and limited primarily to disposable sampling equipment such as gloves, paper towel, decontamination water, and spoons, and will be handled in accordance with Appendix B of the Work Plan (*Project-specific Waste Management Plan*).

Sample Identification

Documentation soil samples will be named in accordance with SOP-19 (*Sample Handling, Identification, and Custody*).

References

Alaska Department of Environmental Conservation (ADEC). May 2010. *Draft Field Sampling Guidance*.

CH2M HILL. August 2010. *Work Plan for Site Inspection, Remedial Investigation, and Site Characterization, Former Galena Forward Operating Location, Alaska*. Final. Prepared for the Air Force Center for Engineering and the Environment.

TABLE E-1

Documentation Sampling

Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena Forward Operating Location, Alaska

Documentation Sampling Events

Event	Freq/Time	Purpose	Type	No. of Locations	Samples Analyzed	Analytes	Comments
Documentation Sampling	As needed/After excavation is complete in an area and before backfilling	Document contamination left in place after excavation.	Grab	SS017 Excavation – 7 samples from the floor; 8 samples from the sidewalls.	15	BTEX, GRO, DRO, RRO, and PAHs (10% of samples will be analyzed for PAHs)	Floor Area: 5,030 ft ² Perimeter: 388 feet
	As needed/After excavation is complete in an area and before backfilling	Document contamination left in place after excavation.	Grab	SS014 Excavation – 4 samples from the floor; 7 samples from the sidewalls.	11	BTEX, GRO, DRO, RRO, and PAHs (10% of samples will be analyzed for PAHs)	Floor Area: 2,930 ft ² Perimeter: 310 feet
	As needed/After excavation is complete in an area and before backfilling	Document contamination left in place after excavation.	Grab	SS016 East Excavation – 5 samples from the floor; 12 samples from the sidewalls.	17	BTEX, GRO, DRO, RRO, and PAHs (10% of samples will be analyzed for PAHs)	Floor Area: 3,960 ft ² Perimeter: 570 feet
	As needed/After excavation is complete in an area and before backfilling	Document contamination left in place after excavation.	Grab	SS016 West Excavation – 5 samples from the floor; 7 samples from the sidewalls.	12	BTEX, GRO, DRO, RRO, and PAHs (10% of samples will be analyzed for PAHs)	Floor Area: 3,825 ft ² Perimeter: 320 feet

Notes:

BTEX = benzene, toluene, ethylbenzene, and xylenes

DRO = diesel-range organics

Freq = frequency

ft² = square feet

GRO = gasoline-range organics

No. = number

PAH = polynuclear aromatic hydrocarbons

RRO = residual-range organics

TABLE E-2

Documentation Sampling Matrix

Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena Forward Operating Location, Alaska

Sampling Location	Field Sample ID	Easting (meters)	Northing (meters)	Media	Sample Type	Sample Depth	Field Meter PID	GRO AK101	DRO/RRO AK102/AK103	VOCs SW8260B	PAHs SW8270CSIM	Comment
SS017 Excavation Floor	SS017DS001-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS017 Excavation Floor	SS017DS002-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS017 Excavation Floor	SS017DS003-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS017 Excavation Floor	SS017DS004-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS017 Excavation Floor	SS017DS005-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS017 Excavation Floor	SS017DS006-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1	1	Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS017 Excavation Floor	SS017DS906-So_F	TBD	TBD	Soil	FD	TBD		1	1	1	1	Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS017 Excavation Floor	SS017DS007-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS017 Excavation Sidewall	SS017DS008-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS017 Excavation Sidewall	SS017DS009-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS017 Excavation Sidewall	SS017DS010-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS017 Excavation Sidewall	SS017DS011-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS017 Excavation Sidewall	SS017DS012-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS017 Excavation Sidewall	SS017DS013-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS017 Excavation Sidewall	SS017DS013-So_SMS	TBD	TBD	Soil	MS	TBD		1	1	1		Sidewall – 1 per 50 linear feet
SS017 Excavation Sidewall	SS017DS013-So_SMSD	TBD	TBD	Soil	MSD	TBD		1	1	1		Sidewall – 1 per 50 linear feet
SS017 Excavation Sidewall	SS017DS014-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS017 Excavation Sidewall	SS017DS914-So_S	TBD	TBD	Soil	FD	TBD		1	1	1		Sidewall – 1 per 50 linear feet
SS017 Excavation Sidewall	SS017DS015-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS014 Excavation Floor	SS014DS001-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS014 Excavation Floor	SS014DS002-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1	1	Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS014 Excavation Floor	SS014DS003-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS014 Excavation Floor	SS014DS004-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS014 Excavation Sidewall	SS014DS904-So_FMS	TBD	TBD	Soil	FD	TBD		1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS014 Excavation Sidewall	SS014DS004-So_FMS	TBD	TBD	Soil	MS	TBD		1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS014 Excavation Sidewall	SS014DS004-So_FMSD	TBD	TBD	Soil	MSD	TBD		1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS014 Excavation Sidewall	SS014DS005-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS014 Excavation Sidewall	SS014DS006-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS014 Excavation Sidewall	SS014DS007-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS014 Excavation Sidewall	SS014DS008-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS014 Excavation Sidewall	SS014DS009-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet

TABLE E-2

Documentation Sampling Matrix

Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena Forward Operating Location, Alaska

Sampling Location	Field Sample ID	Easting (meters)	Northing (meters)	Media	Sample Type	Sample Depth	Field Meter PID	GRO AK101	DRO/RRO AK102/AK103	VOCs SW8260B	PAHs SW8270CSIM	Comment
SS014 Excavation Sidewall	SS014DS010-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1	1	Sidewall – 1 per 50 linear feet
SS014 Excavation Sidewall	SS014DS011-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 East Excavation Floor	SS016EASTDS001-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS016 East Excavation Floor	SS016EASTDS002-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS016 East Excavation Floor	SS016EASTDS003-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1	1	Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS016 East Excavation Floor	SS016EASTDS004-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS016 East Excavation Floor	SS016EASTDS005-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS016 East Excavation Sidewall	SS016EASTDS006-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 East Excavation Sidewall	SS016EASTDS007-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 East Excavation Sidewall	SS016EASTDS008-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 East Excavation Sidewall	SS016EASTDS908-So_S	TBD	TBD	Soil	FD	TBD		1	1	1		Sidewall – 1 per 50 linear feet
SS016 East Excavation Sidewall	SS016EASTDS008-So_SMS	TBD	TBD	Soil	MS	TBD		1	1	1		Sidewall – 1 per 50 linear feet
SS016 East Excavation Sidewall	SS016EASTDS008-So_SMSD	TBD	TBD	Soil	MSD	TBD		1	1	1		Sidewall – 1 per 50 linear feet
SS016 East Excavation Sidewall	SS016EASTDS009-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 East Excavation Sidewall	SS016EASTDS010-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 East Excavation Sidewall	SS016EASTDS011-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 East Excavation Sidewall	SS016EASTDS012-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 East Excavation Sidewall	SS016EASTDS013-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 East Excavation Sidewall	SS016EASTDS014-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 East Excavation Sidewall	SS016EASTDS015-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1	1	Sidewall – 1 per 50 linear feet
SS016 East Excavation Sidewall	SS016EASTDS016-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1	1	Sidewall – 1 per 50 linear feet
SS016 East Excavation Sidewall	SS016EASTDS017-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1	1	Sidewall – 1 per 50 linear feet
SS016 West Excavation Floor	SS016WESTDS001-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS016 West Excavation Floor	SS016WESTDS002-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS016 West Excavation Floor	SS016WESTDS003-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS016 West Excavation Floor	SS016WESTDS903-So_F	TBD	TBD	Soil	FD	TBD		1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS016 West Excavation Floor	SS016WESTDS004-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS016 West Excavation Floor	SS016WESTDS005-So_F	TBD	TBD	Soil	N	TBD	1	1	1	1	1	Floor – 2 per first 1,000 ft ² +1 per 1,000 ft ²
SS016 West Excavation Sidewall	SS016WESTDS006-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 West Excavation Sidewall	SS016WESTDS007-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 West Excavation Sidewall	SS016WESTDS008-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet

TABLE E-2

Documentation Sampling Matrix

Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena Forward Operating Location, Alaska

Sampling Location	Field Sample ID	Easting (meters)	Northing (meters)	Media	Sample Type	Sample Depth	Field Meter PID	GRO AK101	DRO/RRO AK102/AK103	VOCs SW8260B	PAHs SW8270CSIM	Comment
SS016 West Excavation Sidewall	SS016WESTDS009-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 West Excavation Sidewall	SS016WESTDS010-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 West Excavation Sidewall	SS016WESTDS011-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS016 West Excavation Sidewall	SS016WESTDS012-So_S	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 50 linear feet
SS017 Excavation	SS017-EB001	NA	NA	Water	EB	NA		1	1	1		Equipment Blank
SS014 Excavation	SS014-EB002	NA	NA	Water	EB	NA		1	1	1		Equipment Blank
SS016 East Excavation	SS016EAST-EB003	NA	NA	Water	EB	NA		1	1	1		Equipment Blank
Totals Normal Samples					N		55	55	55	55	6	
Total MS and MSD Samples					MS/MSD		0	6	6	6	2	
Total Field Duplicate Samples					FD		0	5	5	5	1	
Total Equipment Blank					EB		0	3	3	3	0	

Notes:

Analysis will be performed at an offsite lab with a standard turnaround time (20 days).

Field sample ID: refer to SOP-19 (*Sample Handling and Custody*), for details regarding sample identification nomenclature.

indicates that the sample location associated with this quality assurance/quality control sample will be determined.

- DRO = diesel-range organics
- EB = equipment blank
- F = floor sample
- FD = field duplicate sample
- ft² = square feet
- GRO = gasoline-range organics
- ID = identification
- MS = matrix spike sample
- MSD = matrix spike duplicate sample
- N = normal sample
- NA = not applicable
- PAH = polynuclear aromatic hydrocarbons
- PID = photoionization detector
- RRO = residual-range organics
- So = soil
- TBD = to be determined
- VOC = volatile organic compound

TABLE E-3

Confirmation Sampling

Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena Forward Operating Location, Alaska

Documentation Sampling Events

Event	Freq/Time	Purpose	Type	No. of Locations	Samples Analyzed	Analytes	Comments
Confirmation Sampling	As needed/After excavation is complete in an area and before backfilling	Document excavation is complete (any contamination left in place after excavation is below ADEC Method 2 cleanup levels).	Grab	SS005 North Excavation – 8 samples from the floor; 14 samples from the sidewalls.	22	BTEX, GRO, DRO, RRO, and PAHs (10% of samples will be analyzed for PAHs)	Floor Area: 1,730 ft ² Perimeter: 270 feet
	As needed/After excavation is complete in an area and before backfilling	Document excavation is complete (any contamination left in place after excavation is below ADEC Method 2 cleanup levels).	Grab	SS005 South Excavation – 5 samples from the floor; 9 samples from the sidewalls.	14	BTEX, GRO, DRO, RRO, and PAHs (10% of samples will be analyzed for PAHs)	Floor Area: 1,050 ft ² Perimeter: 180 feet
	As needed/After excavation is complete in an area and before backfilling	Document contamination left in place after excavation.	Grab	AST1569 Excavation – 2 samples from the floor; 5 samples from the sidewalls.	7	BTEX, GRO, DRO, RRO, and PAHs (10% of samples will be analyzed for PAHs)	Floor Area: 140 ft ² Perimeter: 95 feet

Notes:

BTEX = benzene, toluene, ethylbenzene, and xylenes

DRO = diesel-range organics

Freq = frequency

ft² = square feet

GRO = gasoline-range organics

No. = number

PAH = polynuclear aromatic hydrocarbons

RRO = residual-range organics

TABLE E-4

Confirmation Sampling Matrix

Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena Forward Operating Location, Alaska

Sampling Location	Field Sample ID	Easting (meters)	Northing (meters)	Media	Sample Type	Sample Depth	Field Meter PID	GRO AK101	DRO/RRO AK102/AK103	VOCs SW8260B	PAHs SW8270CSIM	Comment
SS005 North Excavation Floor	SS005CS001-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²
SS005 North Excavation Floor	SS005CS002-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²
SS005 North Excavation Floor	SS005CS003-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²
SS005 North Excavation Floor	SS005CS004-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor –2 per first 250 ft ² +1 per 250 ft ²
SS005 North Excavation Floor	SS005CS005-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²
SS005 North Excavation Floor	SS005CS006-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²
SS005 North Excavation Floor	SS005CS007-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²
SS005 North Excavation Floor	SS005CS907-SO_##	TBD	TBD	Soil	FD	TBD		1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²
SS005 North Excavation Floor	SS005CS008-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1	1	Floor – 2 per first 250 ft ² +1 per 250 ft ²
SS005 North Excavation Sidewall	SS005CS009-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1	1	Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS010-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS011-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS012-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS013-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS014-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS914-SO_##	TBD	TBD	Soil	FD	TBD		1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS015-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS016-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS017-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS018-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS019-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS020-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS021-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS921-SO_##	TBD	TBD	Soil	FD	TBD		1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS021-SO_##MS	TBD	TBD	Soil	MS	TBD		1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS021-SO_##MSD	TBD	TBD	Soil	MSD	TBD		1	1	1		Sidewall – 1 per 20 linear feet
SS005 North Excavation Sidewall	SS005CS022-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 South Excavation Floor	SS005CS023-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²
SS005 South Excavation Floor	SS005CS024-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²
SS005 South Excavation Floor	SS005CS025-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²
SS005 South Excavation Floor	SS005CS026-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²

TABLE E-4

Confirmation Sampling Matrix

Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena Forward Operating Location, Alaska

Sampling Location	Field Sample ID	Easting (meters)	Northing (meters)	Media	Sample Type	Sample Depth	Field Meter PID	GRO AK101	DRO/RRO AK102/AK103	VOCs SW8260B	PAHs SW8270CSIM	Comment
SS005 South Excavation Floor	SS005CS027-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²
SS005 South Excavation Sidewall	SS005CS028-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 South Excavation Sidewall	SS005CS029-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 South Excavation Sidewall	SS005CS030-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 South Excavation Sidewall	SS005CS031-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 South Excavation Sidewall	SS005CS032-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 South Excavation Sidewall	SS005CS932-SO_##	TBD	TBD	Soil	FD	TBD		1	1	1	1	Sidewall – 1 per 20 linear feet
SS005 South Excavation Sidewall	SS005CS033-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 South Excavation Sidewall	SS005CS034-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 South Excavation Sidewall	SS005CS035-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 South Excavation Sidewall	SS005CS036-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
SS005 South Excavation Sidewall	SS005CS036-SO_##MS	TBD	TBD	Soil	MS	TBD		1	1	1		Sidewall – 1 per 20 linear feet
SS005 South Excavation Sidewall	SS005CS036-SO_##MSD	TBD	TBD	Soil	MSD	TBD		1	1	1		Sidewall – 1 per 20 linear feet
AST 1569 Excavation Floor	AST1569CS001-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²
AST 1569 Excavation Floor	AST1569CS002-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²
AST 1569 Excavation Floor	AST1569CS902-SO_##	TBD	TBD	Soil	FD	TBD		1	1	1		Floor – 2 per first 250 ft ² +1 per 250 ft ²
AST 1569 Excavation Sidewall	AST1569CS003-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
AST 1569 Excavation Sidewall	AST1569CS004-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
AST 1569 Excavation Sidewall	AST1569CS005-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
AST 1569 Excavation Sidewall	AST1569CS006-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1		Sidewall – 1 per 20 linear feet
AST 1569 Excavation Sidewall	AST1569CS007-SO_##	TBD	TBD	Soil	N	TBD	1	1	1	1	1	Sidewall – 1 per 20 linear feet
AST 1569 Excavation Sidewall	AST1569CS007-SO_##	TBD	TBD	Soil	MS	TBD		1	1	1	1	Sidewall – 1 per 20 linear feet
AST 1569 Excavation Sidewall	AST1569CS007-SO_##	TBD	TBD	Soil	MSD	TBD		1	1	1	1	Sidewall – 1 per 20 linear feet
SS005 North Excavation	SS005-EB001	NA	NA	Water	EB	NA		1	1	1	1	Equipment Blank
SS005 South Excavation	SS005-EB002	NA	NA	Water	EB	NA		1	1	1	1	Equipment Blank
AST1569 Excavation	AST1569-EB001	NA	NA	Water	EB	NA		1	1	1	1	Equipment Blank
SS005 North Excavation	SS005-TB001	NA	NA	Water	TB	NA		1		1		Trip Blank
SS005 South Excavation	SS005-TB002	NA	NA	Water	TB	NA		1		1		Trip Blank
AST1569 Excavation	AST1569-TB001	NA	NA	Water	TB	NA		1		1		Trip Blank
Totals Normal Samples					N		43	43	43	43	5	
Total MS and MSD Samples					MS/MSD		0	6	6	6	2	

TABLE E-4

Confirmation Sampling Matrix

Work Plan for Interim Removal Action at Sites SS005, SS014, SS016, SS017, and AST1569 at Former Galena Forward Operating Location, Alaska

Sampling Location	Field Sample ID	Easting (meters)	Northing (meters)	Media	Sample Type	Sample Depth	Field Meter PID	GRO AK101	DRO/RRO AK102/AK103	VOCs SW8260B	PAHs SW8270CSIM	Comment
Total Field Duplicate Samples					FD		0	5	5	5	1	
Total Trip Blanks					TB		0	3	3	3	0	
Total Equipment Blank					EB		0	3	3	3	0	

Notes:

Analysis will be performed at an offsite lab with a standard turnaround time (20 days).

Field sample ID: refer to SOP-19 (*Sample Handling and Custody*), for details regarding sample identification nomenclature.

indicates that the sample depths associated with this QA/QC sample will be determined.

DRO = diesel-range organics

EB = equipment blank

FD = field duplicate sample

ft² = square feet

GRO = gasoline-range organic

ID = identification

MS = matrix spike sample

MSD = matrix spike duplicate sample

N = normal sample

NA = not applicable

PAH = polynuclear aromatic hydrocarbon

PID = photoionization detector

RRO = residual-range organic

SO = soil

TB = trip blank

TBD = to be determined

VOC = volatile organic compound

