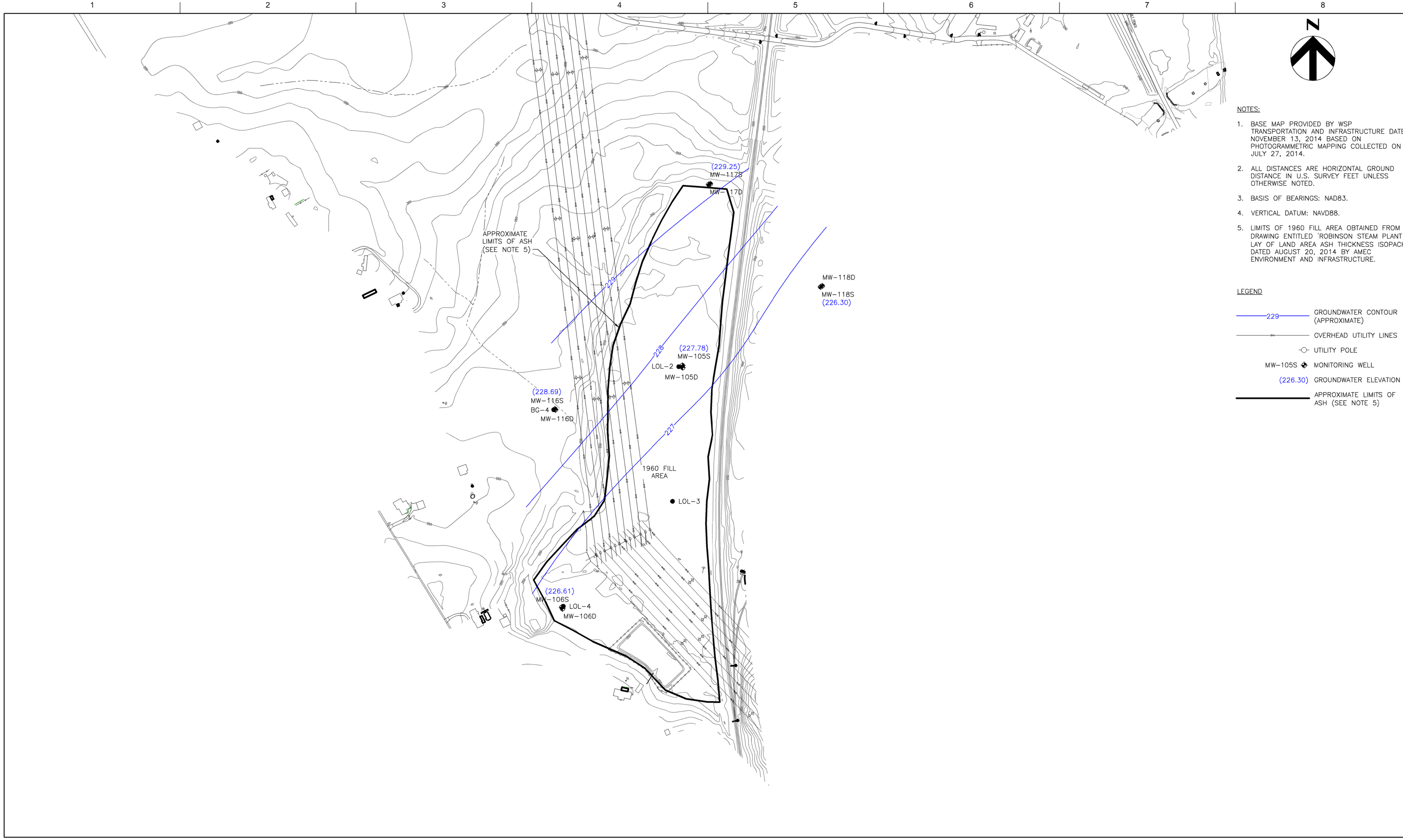

NOTES:

1. BASE MAP PROVIDED BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED NOVEMBER 13, 2014 BASED ON PHOTOGRAMMETRIC MAPPING COLLECTED ON JULY 27, 2014.
2. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCE IN U.S. SURVEY FEET UNLESS OTHERWISE NOTED.
3. BASIS OF BEARINGS: NAD83.
4. VERTICAL DATUM: NAVD88.
5. LIMITS OF 1960 FILL AREA OBTAINED FROM DRAWING ENTITLED 'ROBINSON STEAM PLANT LAY OF LAND AREA ASH THICKNESS ISOPACH' DATED AUGUST 20, 2014 BY AMEC ENVIRONMENT AND INFRASTRUCTURE.

LEGEND

229	GROUNDWATER CONTOUR (APPROXIMATE)
	OVERHEAD UTILITY LINES
	UTILITY POLE
MW-105S	MONITORING WELL
(226.30)	GROUNDWATER ELEVATION
	APPROXIMATE LIMITS OF ASH (SEE NOTE 5)

HDR Engineering, Inc. of the Carolinas

N.C.B.E.L.S. License Number: F-0116

440 S. Church Street, Suites 900 & 1000
Charlotte, NC 28202-2075
704.338.6700

ISSUE	DATE	DESCRIPTION
A	12/2014	ISSUED FOR APPROVAL

PROJECT MANAGER	M. FILARDI, P.G.
PROJECT ENGINEER	
STRUCTURAL	
PLUMBING	
ELECTRICAL	
DRAWN BY	C. HEARN, P.E.
PROJECT NUMBER	011237-243758-012

NOT FOR CONSTRUCTION

DUKE ENERGY.

Duke Energy Progress

Robinson Plant
Ash Basin Closure Project

DARLINGTON COUNTY SOUTH CAROLINA

POTENTIOMETRIC SURFACE MAP
1960 FILL AREA
NOVEMBER 17, 2014

0 1" 2"

FILENAME 01C-03.dwg
SCALE 1" = 200'

SHEET
FIGURE 8

C:\pwworking\pa\d0597810\01C-03.dwg, Plot (2), 12/20/2014 2:21:09 PM, chearn

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Tables

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Table 1. Well construction and groundwater elevation data summary

Well Location	Well ID	Well Depth (ft bgs) [1]	Screen Interval (ft bgs) [1]	Ground Elevation (ft)	Top of Casing Elevation (ft)	Depth to Water (ft below TOC)	Water Elevation (ft)
Ash Basin Closure Monitoring Wells	MW-7D	60	55-60	242.94	245.06	18.69	226.37
	MW-101D	71	66-71	265.67	268.19	28.44	239.75
	MW-102D	85	80-85	253.75	256.34	30.09	226.25
	MW-107S	40.5	30.5-40.5	270.32	273.19	36.75	236.44
	MW-107D	67	62-67	270.14	273.14	36.73	236.41
	MW-108S	57	47-57	283.97	286.47	50.94	235.53
	MW-108D	83	78-83	283.85	286.36	51.51	234.85
	MW-109S	45	35-45	268.02	270.33	37.78	232.55
	MW-109D	82	77-82	268.08	270.29	38.87	231.42
	MW-110S	50	40-50	270.17	272.51	44.69	227.82
	MW-110D	75	70-75	270.40	272.37	44.74	227.63
	MW-111S	42	32-42	267.14	269.54	36.24	233.30
	MW-111D	73	68-73	267.38	269.67	36.04	233.63
	MW-112S	25	15-25	240.49	243.73	21.06	222.67
	MW-113S	37	27-37	252.68	255.16	32.09	223.07
	MW-113D	69	64-69	252.76	255.75	32.91	222.84
	MW-114S	37	27-37	254.81	257.53	34.31	223.22
	MW-114D	68	63-68	254.93	257.44	33.71	223.73
	MW-115S	50.5	40.5-50.5	286.19	288.67	49.43	239.24
	MW-115D	77	72-77	286.09	288.73	49.70	239.03
1960 Fill Area Monitoring Wells	MW-105S	35	25-35	254.86	256.86	29.08	227.78
	MW-105D	66	61-66	254.72	256.81	29.16	227.65
	MW-106S	34	24-34	253.53	255.84	29.23	226.61
	MW-106D	65	60-65	253.66	256.13	29.54	226.59
	MW-116S	34	24-34	255.07	257.51	28.82	228.69
	MW-116D	65	60-65	255.17	257.53	29.02	228.51
	MW-117S	32	22-32	252.66	255.33	26.08	229.25
	MW-117D	65	60-65	252.60	255.30	26.36	228.94
	MW-118S	25	15-25	244.71	246.82	20.52	226.30
	MW-118D	54	49-54	244.70	246.98	20.76	226.22
Existing Ash Basin Monitoring Wells [1]	MW-1R	36	26-36	265.25	267.55	27.80	239.75
	MW-2R	42.5	32.5-42.5	254.14	256.85	30.68	226.17
	MW-3R	69	59-69	277.22	280.34	51.56	228.78
	MW-5	39	29-39	--	--	--	--
	MW-6	49	39-49	--	--	--	--
	MW-7	34	24-34	--	--	19.44	--

Notes:

1. Existing ash basin groundwater monitoring well depths and screen intervals are measured from top of casing.
2. ft bgs indicates feet below ground surface.
3. TOC indicates top of well casing.
4. Water elevation measurements for all monitoring wells except MW-5 and MW-6 were gauged by HDR personnel on November 17, 2014.
5. Water elevation measurements for existing monitoring wells MW-5 and MW-6 were gauged by HDR personnel on July 15, 2014.
6. Elevations based on vertical datum NAVD88.

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Table 2A. Geotechnical laboratory testing quantities by sample type and test method

Laboratory Test	Standard	Number Of Tests
Sieve Analysis (Mechanical Only)	ASTM D422	17
Sieve Analysis (With Hydrometer)	ASTM D422	7
Specific Gravity	ASTM D854	8
Atterberg Limits	ASTM D4318	10
Natural Moisture Content Determination	ASTM D 2216	18
Cu Triaxial Compression Test (3 Confining Stresses)	ASTM D4767	1
Hydraulic Conductivity	ASTM 5084	4

Table 2B. Geotechnical laboratory results summary – soil classifications

TB #	SAMPLE #	DEPTH (ft)	USCS LABORATORY DESCRIPTION	USCS CLASS	AASHTO CLASS	LL	PL	PI	NMC (%)	Gs	USCS GRAIN SIZE DISTRIBUTION							D60	D50	D30	D10
											GRAVEL		SAND			FINES	FINES				
											3"<%<3/4"	*3/4"<%<#4*	*#4<%<#10*	*#10<%<#40*	*#40<%<#200*	*<#200*	*<#200*				
											COARSE GRAVEL (%)	FINE GRAVEL (%)	COARSE SAND (%)	MED SAND (%)	FINE SAND (%)	SILT (%)	CLAY (%)				
AP-1	S-3	6' - 7.5'	Poorly Graded SAND with Silt	SP-SM	A-2-4(0)	NV	NP	NP	5.3	-	0	0	0.1	29.3	59.7	10.9		0.35	0.29	0.18	-
AP-2	S-4	18.5' - 20'	Poorly Graded SAND with Silt	SP-SM	A-1-b	NV	NP	NP	13.7	-	0	0	0.6	59.9	28.6	10.9		0.63	0.53	0.30	-
	S-8	98.5' - 100'	Fat CLAY	CH	A-7-6(32)	54	24	30	21.7	2.573	0	0	0	1.7	3.7	17.3	77.3	0.00	0.00	-	-
AP-3	S-7	23.5' - 25'	Fat CLAY with Sand	CH	A-7-6(23)	54	25	29	24.0	2.621	0	0	0	7.7	16.7	9.3	66.3	0.00	-	-	-
AP-4	S-4	8.5' - 10'	Poorly Graded SAND with Silt	SP-SM	A-3	NV	NP	NP	5.6	-	0	0	0	27.5	63.5	9		0.30	0.23	0.15	0.08
	S-6	18.5' - 20'	Sandy Lean CLAY	CL	A-6(4)	31	18	13	18.1	2.62	0	0	0.2	8.3	38	24	29.5	0.09	0.07	0.01	-
	S-9	33.5' - 35'	Silty, Clayey SAND	SC-SM	A-2-4(0)	22	15	7	12.8	2.647	0	0	3.4	59.6	23.7	0.5	12.8	0.78	0.62	0.33	-
	S-12	48.5' - 50'	Poorly Graded SAND	SP	A-1-b	NV	NP	NP	16.2	-	0	0	1.3	71.6	24.2	2.9		0.63	0.57	0.44	0.24
AP-5	S-2	63.5' - 65'	Sandy Lean CLAY	CL	A-4(4)	28	18	10	24.0	-	0	0	0.3	28.2	6.9	64.6		-	-	-	-
	S-6	87.4' - 88.8'	Lean CLAY	CL	A-7-6(20)	43	22	21	19.7	2.631	0	0	0	0.1	9	39.8	51.1	0.01	0.00	0.00	-
AP-8	S-2	3.5' - 5'	Poorly Graded SAND with Silt	SP-SM	A-3	NV	NP	NP	2.2	2.631	0	0	0.1	33.4	57.6	8.9		0.36	0.28	0.17	0.08
AP-9	S-4	21' - 22.5'	Silty SAND	SM	A-2-4(0)	NV	NP	NP	4.5	-	0	0	0.1	1.8	85.5	12.6		0.17	0.15	0.12	-
AP-11	S-4	8.5' - 10'	Silty SAND	SM	A-2-4(0)	NV	NP	NP	22.6	-	0	0	0.4	38.1	47.8	13.7		0.41	0.32	0.18	-
	S-11	43.5' - 45'	Poorly Graded SAND with Silt	SP-SM	A-1-b	NV	NP	NP	18.7	-	0	0	0.3	57.6	36.4	5.7		0.55	0.48	0.34	0.17
DD-1	S-9	33.5' - 35'	Silty SAND	SM	A-2-4(0)	NV	NP	NP	13.3	-	0	0	0.3	23.2	43.7	32.8		0.24	0.16	-	-
	S-12	48.5' - 50'	Lean CLAY with Sand	CL	A-4(6)	27	17	10	25.2	2.642	0	0	0	0.7	23.8	50.7	24.8	0.04	0.03	0.01	-
DD-2	S-9	38.5' - 40'	Silty SAND	SM	A-2-4(0)	NV	NP	NP	12.9	-	0	0	0.3	21.5	48.1	30.1		0.23	0.16	-	-
DD-2	S-13	70' - 71.5'	Poorly Graded SAND with Silt	SP-SM	A-1-b	NV	NP	NP	19.8	-	0	0	1.7	77.7	14.8	5.8		0.67	0.61	0.49	0.18
AP-10	UD #2 (top 6")	36' - 38'	Well Graded SAND with Silt	SW-SM	A-1-b	NV	NP	NP	-	-	0	0.2	21.6	58.6	12.6	7		1.43	1.21	0.79	0.15
	UD #2 (middle 6")	36' - 38'	Clayey SAND	SC	A-2-6(0)	37	19	18	-	-	0	0	6.5	64.1	10.2	19.2		1.07	0.90	0.45	-
	UD #2 (bottom 6")	36' - 38'	Lean CLAY with Sand	CL	A-6(7)	31	19	12	-	2.623	0	0	0	4.4	21.2	29.7	44.7	0.02	0.01	0.00	-
AP-11A	UD	18.5' - 20'	Poorly Graded SAND with Silt	SP-SM	A-1-b	NV	NP	NP	-	-	0	0	1.2	83.3	9.6	5.9		0.95	0.82	0.60	0.16
DD-2	UD #1 (top 6")	23' - 24.5'	Poorly Graded SAND	SP					-	-	0	0	3.6	74.8	17.9	3.7		0.82	0.70	0.50	0.28
	UD #1 (bottom 6")	23' - 24.5'	Clayey SAND	SC	A-2-4(0)	22	14	8		-	0	0	1	34	40.9	24.1		0.37	0.27	0.11	-

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Table 3A. Soil sampling results – background samples

Parameter	Units	Sample ID and Location														EPA Industrial SSL	MCL-Based EPA Protection of Groundwater SSL
		BG-1 (1-2')	BG-1 (10-11')	BG-1 (20-21')	BG-1 (30-31')	BG-2 (1-2')	BG-2 (10-11')	BG-2 (20-21')	BG-3 (1-2')	BG-3 (10-11')	BG-3 (20-21')	BG-3 (30-31')	BG-4 (1-2')	BG-4 (10-11')	BG-4 (20-21')		
		Northwest of Ash Basin				West of Ash Basin			West-Southwest of Ash Basin				West of Lay of Land Area				
Antimony	mg/kg	< 0.51	< 0.36	< 0.51	< 0.54	< 0.55	< 0.42	< 0.51	< 0.54	< 0.48	< 0.48	< 0.51	< 0.42	< 0.40	< 0.40	470	0.27
Arsenic	mg/kg	< 1.0	**0.81**	**1.2**	< 1.1	**1.2**	**1.4**	**2.1**	< 1.1	**1.8**	< 0.95	**1.1**	**1.3**	< 0.81	< 0.80	3.0	0.29
Barium	mg/kg	2.8	2.7	2.5	6.4	2.6	6.5	1.9	15.8	6.6	1.5	3.1	5.4	0.85	0.62	220,000	82
Beryllium	mg/kg	< 0.10	< 0.073	< 0.10	< 0.11	< 0.11	< 0.085	< 0.10	< 0.11	< 0.096	< 0.095	< 0.099	< 0.083	< 0.081	< 0.080	2,300	3.2
Boron	mg/kg	< 0.84	< 3.94	< 4.37	< 4.19	< 4.18	< 4.35	< 5.31	< 3.77	< 4.17	< 4.27	< 4.25	< 0.72	< 5.10	< 4.01	230,000	NE
Cadmium	mg/kg	< 0.10	< 0.073	< 0.10	< 0.11	< 0.11	< 0.085	< 0.10	< 0.11	< 0.096	< 0.095	< 0.099	< 0.083	< 0.081	< 0.080	NE	0.38
Chloride	mg/kg	< 13	< 11	< 11	< 11	< 10	< 11	< 13	< 10	< 11	< 11	< 11	< 11	< 13	< 10	NE	NE
Chromium	mg/kg	10.9	9.1	14.3	4.2	5.5	7.3	4.8	5.7	14.6	4.8	13.6	5.1	4.2	5.7	NE	180,000
Cobalt	mg/kg	< 0.51	< 0.36	< 0.51	< 0.54	< 0.55	0.48	< 0.51	< 0.54	< 0.48	< 0.48	< 0.5	< 0.42	< 0.40	< 0.40	350	NE
Copper	mg/kg	1.5	2.3	2.3	1.2	1.7	2.5	3.3	1.2	3.3	0.93	2.0	1.6	0.69	< 0.40	47,000	46
Iron	mg/kg	2890	4690	8620	3200	2330	5160	5580	2850	9540	2840	6450	3250	1100	1070	820,000	NE
Lead	mg/kg	1.3	1.2	2.4	1.1	1.1	1.8	1.4	1.7	3.2	1.4	1.3	0.67	< 0.40	0.49	800	14
Manganese	mg/kg	6.6	5.2	3.4	7.7	1.9	83.1	13.6	7.1	12.1	1.6	1.6	20.3	5.8	3.5	26,000	NE
Mercury	mg/kg	0.0050	< 0.0052	0.0097	< 0.0055	0.0070	0.010	0.0063	0.0080	0.015	< 0.0043	0.0082	0.0070	< 0.0029	0.0041	40	0.1
Molybdenum	mg/kg	< 0.51	< 0.36	< 0.51	< 0.54	0.59	< 0.42	< 0.51	< 0.54	0.73	< 0.48	0.53	< 0.42	< 0.40	0.66	5,800	NE
Nickel	mg/kg	2.3	0.44	0.51	< 0.54	< 0.55	1.2	0.62	0.91	1.5	0.52	0.62	1.2	< 0.40	< 0.40	22,000	NE
Selenium	mg/kg	< 1.0	< 0.73	< 1.0	< 1.1	< 1.1	< 0.85	< 1.0	< 1.1	< 0.96	< 0.95	< 1.0	< 0.83	< 0.81	< 0.80	5,800	0.26
Thallium	mg/kg	< 1.0	< 0.73	< 1.0	< 1.1	< 1.1	< 0.85	< 1.0	< 1.1	< 0.96	< 0.95	< 1.0	< 0.83	< 0.81	< 0.80	12	0.14
Zinc	mg/kg	1.3	< 0.73	1.1	< 1.1	1.6	3.3	1.5	1.8	3.0	< 0.95	1.3	2.5	< 0.81	< 0.80	350,000	NE
pH	SU	6.2	5.0	5.1	4.9	5.0	4.3	4.5	4.8	5.0	5.4	5.0	5.2	4.5	5.2	NE	NE

Notes:
1. Concentrations presented in milligrams per kilogram (mg/kg).
2. Screening levels from the Environmental Protection Agency (EPA) Regional Screening Level (RSL) Summary Table (TR=1E-6, HQ=1) dated May 2014.
3. Analytical results obtained from Pace Analytical Services, Inc. laboratory report: Project Duke Robinson 234758.
4. Analytical results with a "<" preceding the result indicates that the parameter was not detected at a concentration which attains or exceeds the laboratory method reporting limit (MRL).
5. NE indicates not established.
6. SU indicates Standard Units.
7. **Bold** indicates a concentration which attains or exceeds the corresponding MCL-based EPA Protection of Groundwater Soil Screening Level (SSL).
8. Sample depth interval (feet below ground surface) is indicated in parentheses of the sample ID.

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Table 3B. Ash and soil sampling results – within ash basin boundary

Parameter	Units	Sample ID and Location																EPA Industrial SSL	MCL-Based EPA Protection of Groundwater SSL
		AP-2 (2-3')	AP-2 (40-42')	AP-5 (1-3')	AP-5 (31-34')	AP-6 4-6')	AP-6 (14-16')	AP-6 (24-26')	AP-7 (2-4')	AP-7 (11-13')	AP-7 (17-20')	AP-9 (1-2')	AP-9 (7-10')	AP-9 (13-16')	AP-10 (1-3')	AP-10 (28-30')	AP-10 (36-39')		
		West Portion of Ash Basin		Central Portion of Ash Basin					Southeast Portion of Ash Basin			Northeast Portion of Ash Basin			East Portion of Ash Basin				
Total Inorganics																			
Antimony	mg/kg	< 1.3	0.61	**0.63**	< 0.57	**1.6**	< 0.54	< 0.57	**0.66**	**0.82**	< 0.41	**1.1**	**2.8**	< 0.51	< 0.88	< 0.72	< 0.43	470	0.27
Arsenic	mg/kg	**254**	**195**	**63.7**	**53.9**	**122**	**83.5**	< 1.1	**89.3**	**87.5**	**1.7**	**54.4**	**94.0**	**5.2**	**52.6**	**66.1**	**0.86**	3.0	0.29
Barium	mg/kg	**786**	**342**	**550**	**566**	**429**	**332**	4.6	**389**	**350**	3.0	**149**	**273**	10.2	**696**	**743**	6.5	220,000	82
Beryllium	mg/kg	5.3	4.1	3.1	2.8	**3.8**	**3.3**	< 0.11	**3.9**	**4.2**	< 0.082	2.8	**4.7**	0.23	2.6	**3.2**	< 0.085	2,300	3.2
Boron	mg/kg	16.6	29.5	17.9	19.4	15.8	23.1	< 4.52	22.0	21.0	< 4.06	20.7	19.1	< 4.22	5.99	11.2	< 4.39	230,000	NE
Cadmium	mg/kg	0.90	0.55	0.15	0.17	**0.39**	0.26	< 0.11	0.33	0.31	< 0.082	0.24	0.33	< 0.10	0.29	0.21	< 0.085	NE	0.38
Chloride	mg/kg	< 12	< 16	< 12	< 14	< 14	< 15	< 12	< 14	< 15	< 11	14	< 14	< 11	< 12	< 13	< 11	NE	NE
Chromium	mg/kg	32.6	17.3	11.9	14.7	15.2	18.2	6.0	15.1	18.0	1.4	19.2	31.7	6.3	12.3	21.5	2.0	NE	180,000
Cobalt	mg/kg	NA	NA	7.2	5.9	8.0	7.7	< 0.57	10.0	9.4	< 0.41	11.2	19.3	< 0.51	7.3	6.4	< 0.43	350	NE
Copper	mg/kg	91.1	54.4	29.8	32.3	42.6	37.6	1.9	41.7	44.2	1.0	**51.7**	**81.7**	2.2	41.7	**46.1**	0.99	47,000	46
Iron	mg/kg	19100	7650	8880	9250	6310	5000	2230	6340	5580	595	5460	9960	3430	27500	22900	346	820,000	NE
Lead	mg/kg	30.6	17.4	11.6	10	**14.0**	**15.8**	0.95	**18.9**	**18.8**	0.69	**22.1**	**37.5**	1.4	9.2	10.6	1.7	800	14
Manganese	mg/kg	110	43.5	25.0	50.5	51.9	27.1	0.79	27.9	37.0	1.4	24.2	42.1	7.8	56.3	87.1	1.9	26,000	NE
Mercury	mg/kg	**0.48**	**0.10**	**0.10**	0.095	**0.15**	**0.30**	0.013	**0.18**	**0.26**	0.015	**0.25**	**0.46**	0.0070	0.092	0.050	< 0.0052	40	0.1
Molybdenum	mg/kg	6.4	3.2	3.2	3.4	5.1	2.3	< 0.57	7.5	4.2	1.7	5.4	8.2	2.3	5.9	4.4	2.3	5,800	NE
Nickel	mg/kg	31.1	16.0	13.5	12.8	15.7	15.3	< 0.57	19.0	18.2	< 0.41	22.4	37.8	1.5	17.8	22.2	< 0.43	22,000	NE
Selenium	mg/kg	**12.6**	**6.7**	**11.5**	**10.0**	**12.1**	**9.0**	< 1.1	**15.7**	**13.3**	< 0.82	**10.8**	**17.8**	**1.8**	**4.7**	**12.7**	< 0.85	5,800	0.26
Thallium	mg/kg	< 2.6	< 0.95	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.0	< 0.82	< 0.97	< 2.3	< 1.0	< 1.8	< 1.4	< 0.85	12	0.14
Zinc	mg/kg	53.4	26.7	14.8	15.1	22.7	21.2	< 1.1	27.9	26.5	< 0.82	28.6	49.0	4.3	16.2	46.7	< 0.85	350,000	NE
pH	SU	6.2	7.2	6.0	7.4	6.5	7.0	4.7	6.1	6.9	7.0	5.6	5.8	6.8	4.6	7.3	6.9	NE	NE
Radiological																			
Cesium-137	pCi/g	-0.0869 U	-0.069 U	0.0368 U	-0.0405 U	-0.121 U	0.000349 U	-0.0127 U	0.00662 U	0.0186 U	-0.0225 U	-0.0473 U	-0.0359 U	-0.00213 U	-0.00698 U	-0.0826 U	0.00835 U	NE	NE
Cobalt-60	pCi/g	0.082 U	0.0295 U	0.0284 U	-0.0014 U	0.0206 U	0.0135 U	0.00324 U	0.025 U	-0.0151 U	-0.0114 U	-0.00265 U	0.00441 U	0.0244 U	0.028 U	0.0632 U	-0.0284 U	NE	NE

Notes:

1. Concentrations presented in milligrams per kilogram (mg/kg) and pico Curie per gram (pCi/g).
2. Screening levels from the Environmental Protection Agency (EPA) Regional Screening Level (RSL) Summary Table (TR=1E-6, HQ=1) dated May 2014.
3. Analytical results obtained from Pace Analytical Services, Inc. laboratory report: Project Duke Robinson 234758.
4. Analytical results with a "<" preceding the result indicates that the parameter was not detected at a concentration which attains or exceeds the laboratory method reporting limit (MRL).
5. NE indicates not established.
6. SU indicates Standard Units.
7. **Bold** indicates a concentration which attains or exceeds the corresponding MCL-based EPA Protection of Groundwater Soil Screening Level (SSL).
8. **Bold and underline** indicates a concentration which attains or exceeds the corresponding MCL-based EPA Protection of Groundwater SSL and EPA Industrial SSL.
9. Sample depth interval (feet below ground surface) is indicated in parentheses of the sample ID.
10. Grey highlighted columns indicate ash samples.
11. NA indicates not analyzed.
12. U qualifier indicates analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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Table 3C. Soil sampling results – outside ash basin boundary

Parameter	Units	Sample ID and Location																EPA Industrial SSL	MCL-Based EPA Protection of Groundwater SSL
		AP-1 (30-31')	AP-3 (30-31')	AP-4 (30-31')	AP-8 (33-35')	DD-1 (14-15')	DD-1 (34-35')	DD-1 (39-40')	DD-2 (14-15')	DD-2 (39-40')	DD-2 (43-44')	CB-1 (5-6')	CB-1 (12-13')	CB-2 (5-6')	CB-2 (24-25')	CB-3 (5-6')	CB-3 (19-21')		
		Cross Gradient of Ash Basin				Crest of Ash Basin Dam						Downgradient of Ash Basin							
Antimony	mg/kg	< 0.62	< 0.37	< 0.44	< 0.39	< 0.60	< 0.52	< 0.48	< 0.48	< 0.45	< 0.43	< 0.47	< 0.50	< 0.42	< 0.51	< 0.53	< 0.50	470	0.27
Arsenic	mg/kg	< 1.2	< 0.74	< 0.89	< 0.78	< 1.2	**2.2**	< 0.96	< 0.96	**2.7**	< 0.87	< 0.95	< 1.0	**0.98**	< 1.0	< 1.1	< 1.0	3.0	0.29
Barium	mg/kg	0.97	< 0.37	2.0	2.4	7.1	8.2	1.8	1.3	3.0	1.8	0.85	1.7	2.2	< 0.51	6.1	0.75	220,000	82
Beryllium	mg/kg	< 0.12	< 0.074	< 0.089	< 0.078	< 0.12	< 0.10	< 0.096	< 0.096	< 0.090	< 0.087	< 0.095	< 0.10	< 0.084	< 0.10	< 0.11	< 0.10	2,300	3.2
Boron	mg/kg	< 0.84	< 3.79	< 0.90	< 4.20	< 4.26	< 4.12	< 4.22	< 3.95	< 4.48	< 0.86	< 3.75	< 3.90	< 4.02	< 4.06	< 4.12	< 3.95	250,000	NE
Cadmium	mg/kg	< 0.12	< 0.074	< 0.089	< 0.078	< 0.12	< 0.10	< 0.096	< 0.096	< 0.090	< 0.087	< 0.095	< 0.10	< 0.084	< 0.10	< 0.11	< 0.10	NE	0.38
Chloride	mg/kg	< 13	< 10	< 14	< 11	< 11	< 11	< 11	< 10	< 11	< 13	< 10	< 10	< 10	< 10	< 11	< 10	NE	NE
Chromium	mg/kg	2.6	0.70	0.95	5.2	20.8	18.0	1.9	5.7	8.2	2.2	2.3	3.8	9.1	1.0	7.3	1.1	NE	180,000
Cobalt	mg/kg	< 0.62	< 0.37	< 0.44	< 0.39	< 0.60	< 0.52	< 0.48	< 0.48	< 0.45	< 0.43	< 0.47	< 0.50	< 0.42	< 0.51	< 0.53	< 0.50	350	NE
Copper	mg/kg	< 0.62	< 0.37	< 0.44	1.7	3.1	4.2	< 0.48	1.3	1.8	0.64	0.70	0.77	1.7	< 0.51	1.4	< 0.50	47,000	46
Iron	mg/kg	1860	390	175	2710	5220	11700	975	2930	4640	1150	1010	2000	4330	636	3770	590	820,000	NE
Lead	mg/kg	< 0.62	< 0.37	0.71	0.91	1.8	3.0	0.72	1.1	2.0	0.90	< 0.47	0.89	1.2	< 0.51	1.9	< 0.50	800	14
Manganese	mg/kg	0.78	< 0.37	< 0.44	6.2	27.0	5.0	0.64	1.9	5.6	1.9	3.2	1.9	3.5	< 0.51	1.7	1.2	26,000	NE
Mercury	mg/kg	0.0058	< 0.0036	0.0058	0.0080	0.0085	0.028	< 0.0045	< 0.0040	0.013	< 0.0045	< 0.0054	< 0.0049	0.0066	< 0.0047	0.014	< 0.0040	40	0.1
Molybdenum	mg/kg	< 0.62	< 0.37	< 0.44	< 0.39	4.7	0.61	< 0.48	< 0.48	< 0.45	< 0.43	< 0.47	< 0.50	< 0.42	< 0.51	< 0.53	< 0.50	5,800	NE
Nickel	mg/kg	< 0.62	< 0.37	< 0.44	0.76	2.5	1.3	< 0.48	< 0.48	0.45	< 0.43	< 0.47	< 0.50	0.58	< 0.51	< 0.53	< 0.50	22,000	NE
Selenium	mg/kg	< 1.2	< 0.74	< 0.89	< 0.78	< 1.2	< 1.0	< 0.96	< 0.96	< 0.90	< 0.87	< 0.95	< 1.0	< 0.84	< 1.0	< 1.1	< 1.0	5,800	0.26
Thallium	mg/kg	< 1.2	< 0.74	< 0.89	< 0.78	< 1.2	< 1.0	< 0.96	< 0.96	< 0.90	< 0.87	< 0.95	< 1.0	< 0.84	< 1.0	< 1.1	< 1.0	12	0.14
Zinc	mg/kg	< 1.2	< 0.74	< 0.89	< 0.78	6.6	1.3	< 0.96	< 0.96	0.96	< 0.87	1.3	< 1.0	1.6	< 1.0	< 1.1	< 1.0	350,000	NE
pH	SU	4.8	5.0	4.6	5.6	5.6	5.0	5.6	4.8	4.8	5.2	5.2	5.4	4.9	5.4	5.0	4.8	NE	NE

Notes:
1. Concentrations presented in milligrams per kilogram (mg/kg).
2. Screening levels from the Environmental Protection Agency (EPA) Regional Screening Level (RSL) Summary Table (TR=1E-6, HQ=1) dated May 2014.
3. Analytical results obtained from Pace Analytical Services, Inc. laboratory report: Project Duke Robinson 234758.
4. Analytical results with a "<" preceding the result indicates that the parameter was not detected at a concentration which attains or exceeds the laboratory method reporting limit (MRL).
5. NE indicates not established.
6. SU indicates Standard Units.
7. **Bold** indicates a concentration which attains or exceeds the corresponding MCL-based EPA Protection of Groundwater Soil Screening Level (SSL).
8. Sample depth interval (feet below ground surface) is indicated in parentheses of the sample ID.

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Table 3D. Ash and soil sampling results – within 1960 Fill Area

Parameter	Units	Sample ID and Location							EPA Industrial SSL	MCL-Based EPA Protection of Groundwater SSL
		LOL - 2 (4-6')	LOL - 2 (9-11')	LOL - 3 (2-4')	LOL - 3 (7-9')	LOL - 3 (11-13')	LOL - 4 (4-6')	LOL - 4 (9-11')		
		Central Portion of 1960 Fill Area		Central Portion of 1960 Fill Area			Southwest Portion of 1960 Fill Area			
Antimony	mg/kg	< 0.66	< 0.51	< 0.52	< 0.58	< 0.48	< 0.59	< 0.44	470	0.27
Arsenic	mg/kg	**<u>37.0</u>**	< 1.0	**<u>39.0</u>**	**<u>38.7</u>**	**<u>11.0</u>**	**<u>58.0</u>**	**1.6**	3.0	0.29
Barium	mg/kg	**828**	10	**385**	**424**	20.5	**526**	12.7	220,000	82
Beryllium	mg/kg	**4.4**	< 0.10	**3.3**	2.1	< 0.097	**4.1**	< 0.088	2,300	3.2
Boron	mg/kg	6.87	< 0.72	9.67	16.9	< 0.9	18.0	< 4.76	230,000	NE
Cadmium	mg/kg	**0.41**	< 0.10	0.21	0.12	< 0.097	0.33	< 0.088	NE	0.38
Chloride	mg/kg	< 13	< 11	< 15	< 17	< 14	< 12	< 13	NE	NE
Chromium	mg/kg	14.1	5.6	12.5	10.4	6.7	15.6	7.1	NE	180,000
Cobalt	mg/kg	6.5	< 0.51	7.0	4.7	< 0.48	8.8	< 0.44	350	NE
Copper	mg/kg	43.8	1.3	31.5	27.4	2.1	44.5	0.91	47,000	46
Iron	mg/kg	12400	3070	5740	10900	4500	7260	2810	820,000	NE
Lead	mg/kg	10.4	1.0	9.2	6.0	1.9	13.7	0.96	800	14
Manganese	mg/kg	208	13.2	49.3	115	13.5	78.6	5.7	26,000	NE
Mercury	mg/kg	0.058	0.0094	0.097	0.067	0.020	0.094	< 0.0035	40	0.1
Molybdenum	mg/kg	1.1	2.1	0.78	1.2	1.3	1.2	< 0.44	5,800	NE
Nickel	mg/kg	15.6	0.61	12.3	9.8	1.2	20.7	0.53	22,000	NE
Selenium	mg/kg	**3.8**	< 1.0	**2.9**	**9.2**	**1.4**	**5.0**	< 0.88	5,800	0.26
Thallium	mg/kg	< 1.3	< 1.0	< 1.0	< 1.3	< 1.2	< 1.2	< 0.88	12	0.14
Zinc	mg/kg	12.0	1.1	13.0	12	8.6	19.1	< 0.88	350,000	NE
pH	SU	6.3	7	5.9	6.3	6.8	6.2	7.1	NE	NE

Notes:
1. Concentrations presented in milligrams per kilogram (mg/kg).
2. Screening levels from the Environmental Protection Agency (EPA) Regional Screening Level (RSL) Summary Table (TR=1E-6, HQ=1) dated May 2014.
3. Analytical results obtained from Pace Analytical Services, Inc. laboratory report: Project Duke Robinson 234758.
4. Analytical results with a "<" preceeding the result indicates that the parameter was not detected at a concentration which attains or exceeds the laboratory method reporting limit (MRL).
5. NE indicates not established.
6. SU indicates Standard Units.
7. **Bold** indicates a concentration which attains or exceeds the corresponding MCL-based EPA Protection of Groundwater Soil Screening Level (SSL).
8. **<u>Bold and underline</u>** indicates a concentration which attains or exceeds the corresponding MCL-based EPA Protection of Groundwater SSL and EPA Industrial SSL.
9. Sample depth interval (feet below ground surface) is indicated in parentheses of the sample ID.
10. Grey highlighted columns indicate ash samples.

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Table 4. Ash SPLP leaching results – within ash basin and 1960 Fill Area

Parameter	Units	Sample ID and Location												SC DHEC Primary & Secondary MCLs
		AP-2 (2-3')	AP-2 (40-42')	AP-5 (1-3')	AP-5 (31-34')	AP-6 (4-6')	AP-6 (14-16')	AP-7 (2-4')	AP-7 (11-13')	AP-10 (28-30)	LOL-2 (4-6')	LOL-3 (7-9')	LOL-4 (4-6')	
		West Portion of Ash Basin		Central Portion of Ash Basin				Southeast Portion of Ash Basin		East Portion of Ash Basin	Central Portion of 1960 Fill Area	Central Portion of 1960 Fill Area	Southwest Portion of 1960 Fill Area	
Antimony	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	5.9	< 5.0	< 5.0	< 5.0	< 5.0	6
Arsenic	µg/L	**80**	**75**	**14**	**29**	7.9	8.2	6.6	**37**	**11**	3.0	8.9	3.1	10
Barium	µg/L	39	< 10	< 10	74	< 10	< 10	19	< 10	< 10	11	190	26	2000
Beryllium	µg/L	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	4
Boron	µg/L	< 200	< 200	310	< 200	< 200	< 200	< 200	< 200	220	< 200	< 200	< 200	NE
Cadmium	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	5
Chloride	mg/L	3.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.3	< 1.0	4.2	250*
Chromium	µg/L	11	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	100
Cobalt	µg/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NE
Copper	µg/L	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	1000*
Iron	µg/L	1400	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	**330**	300*
Lead	µg/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	NE
Manganese	µg/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	**110**	< 10	50*
Mercury	µg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	NA	< 0.20	NA	2
Molybdenum	µg/L	13	14	< 10	32	14	< 10	63	54	< 10	< 10	< 10	< 10	NE
Nickel	µg/L	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	NE
Selenium	µg/L	21	< 20	26	36	27	< 20	42	< 20	< 20	< 20	22	< 20	50
Thallium	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2
Zinc	µg/L	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	20	< 20	< 20	< 20	5000*
pH	SU	7.4	8.1	7.9	7.3	**8.5**	8.4	**9.6**	**8.5**	**3.4**	**9.8**	6.5	**10**	6.5-8.5

Notes:
1. Concentrations presented in micrograms per liter (µg/L) and milligrams per liter (mg/L).
2. State Primary Drinking Water Regulations: R.61-58 as found in SCDHEC Bureau of Water MCLs, last amended on August 28, 2009.
3. Analytical results obtained from Pace Analytical Services, Inc. laboratory report: Project Duke Robinson 234758.
4. Analytical results with a "<" preceeding the result indicates that the parameter was not detected at a concentration which attains or exceeds the laboratory method reporting limit (MRL).
5. NE indicates not established.
6. SU indicates Standard Units.
7. **Bold** indicates a concentration which attains or exceeds the corresponding Maximum Contaminant Level (MCL).
8. Sample depth interval (feet below ground surface) is indicated in parentheses of the sample ID.
9. NA indicates not analyzed.

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Table 5A. Groundwater monitoring well sample results – total inorganics (total concentrations)

Parameter	Units	Sample Location																SC DHEC Primary & Secondary MCLs
		MW-7	MW-7D	MW-101D	MW-102D	MW-105D	MW-105S	MW-106D	MW-106S	MW-107S	MW-107D	MW-108D	MW-108S	MW-109D	MW-109S	MW-110D	MW-110S	
Field Parameters																		
Field pH	SU	7.0	**6.4**	**11.2**	**6.5**	7.6	**5.0**	**6.3**	**4.5**	**5.2**	**11.4**	6.6	**6.5**	6.6	7.8	6.7	**6.1**	6.5-8.5*
Field Specific Conductance	µmhos/cm	308	372	394	52	91	97	136	49	21	669	229	644	208	661	312	369	NE
Field Temperature	°C	22.2	15	20.7	20.9	19	19	19.4	18.5	20.6	20.7	19.2	20.4	21	22.7	23.4	24	NE
Dissolved Oxygen	mg/L	0.1	0.1	8.7	4.8	5	5.3	6.1	8.0	5.8	5.7	8.7	0.1	0	0.6	1.4	3.8	NE
ORP (REDOX)	mV	-135	-101	-2	423	348	490	409	521	281	-58	86.5	-46	-108	-158	-157	366	NE
Total Inorganics																		
Antimony	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	6
Arsenic	µg/L	**117**	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	**97.4**	< 10.0	**1100**	< 10.0	< 10.0	10
Barium	µg/L	120	70.0	27.2	7.4	21.2	73.9	13	31.3	7.3	29.0	22.3	118	48.2	342	60.1	125	2000
Beryllium	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4
Boron	µg/L	774	893	< 50.0	62.3	217	238	< 50	65.0	< 50.0	< 50.0	232	940	441	1550	758	632	NE
Cadmium	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.4	< 1.0	< 1.0	5
Chromium	µg/L	< 5.0	12.6	36.4	8.4	3.2	< 5.0	< 5	< 5.0	< 5.0	55.0	6.6	< 5.0	< 5	< 5	< 5	6.9	100
Cobalt	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	NE
Copper	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	6.0	< 5.0	< 5.0	< 5.0	1000*
Iron	µg/L	**3080**	**8720**	189	105	83.6	< 50.0	250	< 50.0	**339**	61.3	**314**	**6450**	**740**	259	**10700**	**733**	300*
Lead	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	NE
Manganese	µg/L	**200**	**177**	< 5.0	8.9	17.6	**68.6**	33.2	11.2	< 5.0	< 5.0	**208**	**1150**	**379**	**94.9**	**340**	**232**	50*
Mercury	µg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	2
Molybdenum	µg/L	17.7	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	10.5	< 5.0	24.1	< 5.0	79.0	< 5.0	12.7	NE
Nickel	µg/L	< 5.0	18.2	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	13.2	7.0	NE
Nitrogen, Nitrate	µg/L	< 20	< 20.0	1140	302	824	426	1900	1850	366	985	562	< 20	< 20	< 20	< 20	< 20	10000
Selenium	µg/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	20.8	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	50
Thallium	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2
Zinc	µg/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	11.7	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	5000*

Notes:
1. Concentrations presented in milligrams per liter (mg/L) and micrograms per liter (µg/L).
2. State Primary Drinking Water Regulations: R.61-58 as found in SCDHEC Bureau of Water MCLs, last amended on August 28, 2009.
3. Analytical results obtained from Pace Analytical Services, Inc. laboratory report: Project Duke Robinson 234758.
4. °C Degrees Celsius
5. mV indicates MilliVolts
6. SU indicates Standard Units.
7. umho/cm indicates micromhos per centimeter.
8. NA indicates not analyzed.
9. **Bold** indicates a concentration which attains or exceeds the corresponding Maximum Contaminant Level (MCL).
10. Grey highlighted columns indicate monitoring wells screened in the ash basin.

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Table 5A (cont'd.) Groundwater monitoring well sample results - total inorganics (total concentrations)

Parameter	Units	Sample Location															SC DHEC Primary & Secondary MCLs
		MW-111D	MW-111S	MW-112S	MW-113S	MW-113D	MW-114S	MW-114D	MW-115D	MW-115S	MW-116D	MW-116S	MW-117D	MW-117S	MW-118D	MW-118S	
Field Parameters																	
Field pH	SU	**5.4**	**6.3**	**5.0**	**4.1**	**6.1**	8.0	6.6	**12.2**	**5.6**	**6.2**	**5.9**	**6.1**	**5.2**	**6.2**	**6.4**	6.5-8.5*
Field Specific Conductance	µmhos/cm	150	347	89	629	519	451	564	3330	23	90	63	188	92	80	91	NE
Field Temperature	°C	21.1	20.3	21.5	21.7	21.3	21.9	21.9	19.6	19.8	17.8	18.4	17.5	18.6	19.1	21.5	NE
Dissolved Oxygen	mg/L	6.6	0.3	0.5	6.0	1.0	6.4	0.5	5.8	5.8	3.7	6.8	2.9	7.1	5.6	6.1	NE
ORP (REDOX)	mV	375	156	239	407	127	106	66	-80	437	453	353	-1	498	451	341	NE
Total Inorganics																	
Antimony	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	6
Arsenic	µg/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	10
Barium	µg/L	46.2	67.4	24.4	66.7	32.4	46.7	70	780	7.6	21.0	22.9	84.1	54.2	39.1	14.3	2000
Beryllium	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4
Boron	µg/L	416	660	210	643	1370	1100	1260	< 50.0	< 50.0	< 50	82.8	394	189	205	75.8	NE
Cadmium	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	5
Chromium	µg/L	< 5	6.6	< 5.0	< 5.0	< 5.0	12.3	< 5.0	51.2	< 5.0	< 5	< 5	7.7	< 5.0	< 5.0	< 5	100
Cobalt	µg/L	< 5.0	< 5.0	< 5.0	11.1	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	NE
Copper	µg/L	< 5.0	< 5.0	< 5.0	13.1	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	1000*
Iron	µg/L	61.3	**2010**	117	252	59.3	70	**300**	< 50.0	**596**	**785**	< 50	94.8	< 50.0	168	228	300*
Lead	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	NE
Manganese	µg/L	**165**	**157**	35.1	**328**	**226**	5.0	**75.2**	< 5.0	**100**	**52.4**	**51.4**	**143.0**	**124**	25.8	29.2	50*
Mercury	µg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	2
Molybdenum	µg/L	< 5.0	10.7	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	7.5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	NE
Nickel	µg/L	< 5.0	< 5.0	6.2	29.5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	6.1	< 5.0	< 5.0	< 5.0	NE
Nitrogen, Nitrate	µg/L	608	27.1	271	389	197	233	136	1870	392	1600	398	234	808	553	553	10000
Selenium	µg/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	10.5	< 10.0	< 10.0	50
Thallium	µg/L	1.1	1.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2
Zinc	µg/L	< 10.0	< 10.0	< 10.0	53.4	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	5000*

Notes:
1. Concentrations presented in milligrams per liter (mg/L) and micrograms per liter (µg/L).
2. State Primary Drinking Water Regulations: R.61-58 as found in SCDHEC Bureau of Water MCLs, last amended on August 28, 2009.
3. Analytical results obtained from Pace Analytical Services, Inc. laboratory report: Project Duke Robinson 234758.
4. °C Degrees Celsius
5. mV indicates MilliVolts
6. SU indicates Standard Units.
7. umho/cm indicates micromhos per centimeter.
8. NA indicates not analyzed.
9. **Bold** indicates a concentration which attains or exceeds the corresponding Maximum Contaminant Level (MCL).
10. Grey highlighted columns indicate monitoring wells screened in the ash basin.

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Table 5B. Groundwater monitoring well sample results – major anions and cations

Parameter	Units	Sample Location																SC DHEC Primary & Secondary MCLs
		MW-7D	MW-7	MW-101D	MW-102D	MW-105D	MW-105S	MW-106D	MW-106S	MW-107S	MW-107D	MW-108D	MW-108S	MW-109D	MW-109S	MW-110D	MW-110S	
Alkalinity, Total as CaCO3	mg/L	60.8	106	85.7	16.7	26.1	< 5.0	20.3	< 5.0	< 5.0	150	47.9	312	53.6	238	47.5	71.3	NE
Bromide	mg/L	0.13	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.10	< 0.10	0.2	0.1	0.11	NE
Calcium	µg/L	40500	46100	35700	6570	1820	8160	1790	1340	843	58200	7010	77900	20100	106000	38700	53300	NE
Chloride	mg/L	3.0	2.2	1.7	2.1	3.2	2.3	4	4.4	1.9	2.0	2.7	2	2.4	4.2	3.2	3.5	250*
Iron, Ferrous	mg/L	8.2	2.2	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	2.6	0.64	< 0.5	6	< 0.5	NE
Magnesium	µg/L	4950	200	179	267	326	2180	526	1240	175	< 100	1280	19700	2620	10600	3810	4710	NE
Methane	µg/L	30.4	52.4	< 6.6	< 6.6	< 6.6	< 6.6	< 6.6	< 6.6	< 6.6	< 6.6	15.4	62.8	< 6.6	458	< 6.6	13	NE
Nitrogen, Nitrate	µg/L	< 20	< 20	1140	302	824	426	1900	1850	366	985	562	< 20	< 20	< 20	< 20	< 20	10000
Potassium	µg/L	7310	7340	< 5000	< 5000	7640	< 5000	< 5000	< 5000	< 5000	< 5000	6890	< 5000	6220	10900	7930	7410	NE
Sodium	µg/L	6840	< 5000	< 5000	< 5000	11200	< 5000	24400	< 5000	< 5000	10600	29700	26600	11700	9840	< 5000	5180	NE
Sulfate	mg/L	91.7	< 1.0	4.3	1.8	5.9	30.3	27.2	3.2	1.0	18.1	42.5	46	41.5	135	86.4	102	250*
Sulfide	mg/L	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	NE
Total Dissolved Solids	mg/L	232	195	136	49	66	66	99	< 25	< 25	186	151	389	130	442	201	228	500*

Notes:
1. Concentrations presented in milligrams per liter (mg/L) and micrograms per liter (µg/L).
2. State Primary Drinking Water Regulations: R.61-58 as found in SCDHEC Bureau of Water MCLs, last amended on August 28, 2009.
3. Analytical results obtained from Pace Analytical Services, Inc. laboratory report: Project Duke Robinson 234758.
4. °C Degrees Celsius
5. mV indicates MilliVolts
6. SU indicates Standard Units.
7. umho/cm indicates micromhos per centimeter.
8. NA indicates not analyzed.
9. **Bold** indicates a concentration which attains or exceeds the corresponding Maximum Contaminant Level (MCL).
10. Grey highlighted columns indicate monitoring wells screened in the ash basin.

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Table 5B (cont'd.) Groundwater monitoring well sample results – major anions and cations

Parameter	Units	Sample Location															SC DHEC Primary & Secondary MCLs
		MW-111D	MW-111S	MW-112S	MW-113S	MW-113D	MW-114S	MW-114D	MW-115D	MW-115S	MW-116D	MW-116S	MW-117D	MW-117S	MW-118D	MW-118S	
Alkalinity, Total as CaCO3	mg/L	< 5.0	134	< 5.0	< 5.0	66.5	126	144	696	< 5.0	14.4	11.4	15.4	< 5.0	14.5	17.8	NE
Bromide	mg/L	< 0.10	< 0.10	< 0.10	0.12	0.15	0.15	0.18	< 0.10	0.12	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	NE
Calcium	µg/L	15900	45300	8250	56500	49400	70200	67300	224000	995	2590	2600	15500	8390	2890	10700	NE
Chloride	mg/L	2.8	2.2	1.3	2.9	3.4	3.2	3.7	3.5	2.7	3.7	2.9	3.4	2.1	3	3.8	250*
Iron, Ferrous	mg/L	< 0.50	2.10	< 0.50	< 0.50	< 0.50	< 0.50	< 0.5	< 0.50	0.7	< 0.5	< 0.5	< 0.50	< 0.50	< 0.50	< 0.5	NE
Magnesium	µg/L	1740	9630	944	4640	8110	5410	8520	< 100	272	708	714	2970	1280	967	814	NE
Methane	µg/L	< 6.6	< 6.6	< 6.6	< 6.6	18.0	< 6.6	11.2	< 6.6	11.7	< 6.6	< 6.6	< 6.6	< 6.6	< 6.6	< 6.6	NE
Nitrogen, Nitrate	µg/L	608	27.1	271	389	197	233	136	1870	392	1600	398	234	808	553	1940	10000
Potassium	µg/L	< 5000	7140	< 5000	7090	< 5000	6620	6700	< 5000	< 5000	< 5000	< 5000	< 5000	< 5000	7020	< 5000	NE
Sodium	µg/L	< 5000	< 5000	< 5000	< 5000	42300	6010	31600	73100	< 5000	14000	7530	8750	< 5000	6420	< 5000	NE
Sulfate	mg/L	50.8	43.7	23.7	**319**	176	99.0	127	3.7	38.7	12.5	8.4	58.0	25.6	12.2	7.1	250*
Sulfide	mg/L	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	NE
Total Dissolved Solids	mg/L	105	214	< 25	167	116	285	346	**670**	32	93	52	136	71	65	46	500*

Notes:
1. Concentrations presented in milligrams per liter (mg/L) and micrograms per liter (µg/L).
2. State Primary Drinking Water Regulations: R.61-58 as found in SCDHEC Bureau of Water MCLs, last amended on August 28, 2009.
3. Analytical results obtained from Pace Analytical Services, Inc. laboratory report: Project Duke Robinson 234758.
4. °C Degrees Celsius
5. mV indicates MilliVolts
6. SU indicates Standard Units.
7. umho/cm indicates micromhos per centimeter.
8. NA indicates not analyzed.
9. **Bold** indicates a concentration which attains or exceeds the corresponding Maximum Contaminant Level (MCL).
10. Grey highlighted columns indicate monitoring wells screened in the ash basin.

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Table 5C. Groundwater monitoring well sample results – total inorganics (dissolved concentrations)

Parameter	Units	Sample Location																SC DHEC Primary & Secondary MCLs
		MW-7D	MW-7	MW-101D	MW-102D	MW-105D	MW-105S	MW-106D	MW-106S	MW-107S	MW-107D	MW-108D	MW-108S	MW-109D	MW-109S	MW-110D	MW-110S	
Antimony, Dissolved	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	6
Arsenic, Dissolved	µg/L	< 10.0	**77.4**	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	**22.3**	< 10.0	**1040**	< 10.0	< 10.0	10
Barium, Dissolved	µg/L	63.1	102	22.8	6.3	18.4	70.8	9.8	29.3	6.6	27.5	21.1	99.1	44.9	331	54.6	116	2000
Beryllium, Dissolved	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4
Boron, Dissolved	µg/L	852	682	< 50.0	54.8	196	215	< 50.0	60.4	< 50.0	< 50.0	218	912	435	1570	712	598	NE
Cadmium, Dissolved	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.0	< 1.0	< 1.0	5
Chromium, Dissolved	µg/L	< 5.0	< 5.0	21.1	< 5.0	< 5.0	< 5.0	< 5.0	5.8	< 5.0	54.4	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	100
Cobalt, Dissolved	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	NE
Copper, Dissolved	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	1000*
Iron, Dissolved	µg/L	7050	**1510**	< 50.0	< 50.0	< 50.0	< 50.0	104	< 50.0	< 50.0	< 50.0	< 50.0	**1120**	**537**	ND	**8090**	**482**	300*
Lead, Dissolved	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	NE
Manganese, Dissolved	µg/L	**176**	**180**	< 5.0	7.8	15.3	**64.5**	26.9	14.2	< 5.0	< 5.0	**194**	**1060**	**361**	**92.1**	**308**	**212**	50*
Mercury, Dissolved	µg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	2
Molybdenum, Dissolved	µg/L	< 5.0	15.9	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	5.4	< 5.0	22.1	< 5.0	76.2	< 5.0	11.2	NE
Nickel, Dissolved	µg/L	10	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	11.9	< 5.0	NE
Nitrogen, Nitrate	µg/L	< 20.0	< 20	1140	302	824	426	1900	< 10.0	366	985	562	< 20	< 20	ND	< 20	< 20	10000
Selenium, Dissolved	µg/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	21.0	< 10.0	29.38	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	50
Thallium, Dissolved	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2
Zinc, Dissolved	µg/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	5000*

Notes:
1. Concentrations presented in micrograms per liter (µg/L).
2. State Primary Drinking Water Regulations: R.61-58 as found in SCDHEC Bureau of Water MCLs, last amended on August 28, 2009.
3. Analytical results obtained from Pace Analytical Services, Inc. laboratory report: Project Duke Robinson 234758.
4. °C Degrees Celsius
5. mV indicates MilliVolts
6. SU indicates Standard Units.
7. umho/cm indicates micromhos per centimeter.
8. NA indicates not analyzed.
9. **Bold** indicates a concentration which attains or exceeds the corresponding SC DEHC Groundwater Standard.
10. Grey highlighted columns indicate monitoring wells screened in the ash basin.

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Table 5C (cont'd.) Groundwater monitoring well sample results – total inorganics (dissolved concentrations)

Parameter	Units	Sample Location															SC DHEC Primary & Secondary MCLs
		MW-111D	MW-111S	MW-112S	MW-113S	MW-113D	MW-114S	MW-114D	MW-115D	MW-115S	MW-116D	MW-116S	MW-117D	MW-117S	MW-118D	MW-118S	
Antimony, Dissolved	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	**9.0**	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	6
Arsenic, Dissolved	µg/L	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10	< 10.0	< 10.0	< 10.0	< 10.0	10
Barium, Dissolved	µg/L	42.5	63.4	22.1	63.3	28.5	43.9	63.5	694	6.4	14.8	21	75.6	47.8	35.5	12.7	2000
Beryllium, Dissolved	µg/L	< 1.0	< 1.0	< 1.0	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4
Boron, Dissolved	µg/L	384	617	168	556	1160	939	1090	< 50.0	< 50.0	< 50	74.5	377	182	190	65.3	NE
Cadmium, Dissolved	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	5
Chromium, Dissolved	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	12.6	< 5.0	44.7	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	100
Cobalt, Dissolved	µg/L	< 5.0	< 5.0	< 5.0	11.9	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	NE
Copper, Dissolved	µg/L	< 5.0	< 5.0	< 5.0	11.1	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	1000*
Iron, Dissolved	µg/L	< 50.0	**1830**	76.2	186	< 50.0	< 50.0	< 50.0	< 50.0	**585**	110	< 50	< 50.0	< 50.0	70.1	106	300*
Lead, Dissolved	µg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	NE
Manganese, Dissolved	µg/L	**152**	**147**	33	**312**	**203**	5.8	**68.5**	< 5.0	**103**	33.5	48.6	**152**	**125**	22.5	27.2	50*
Mercury, Dissolved	µg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	2
Molybdenum, Dissolved	µg/L	< 5.0	9.7	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	8.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	NE
Nickel, Dissolved	µg/L	< 5.0	< 5.0	7.1	29.2	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	NE
Nitrogen, Nitrate	µg/L	608	27.1	271	389	197	233	136	1870	392	1600	398	234	808	553	1940	10000
Selenium, Dissolved	µg/L	< 10.0	< 10.0	< 10.0	< 10.0	12.6	< 10.0	10.9	11.3	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	50
Thallium, Dissolved	µg/L	1.1	1.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2
Zinc, Dissolved	µg/L	< 10.0	< 10.0	< 10.0	52.6	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	5000*

Notes:
1. Concentrations presented in micrograms per liter (µg/L).
2. State Primary Drinking Water Regulations: R.61-58 as found in SCDHEC Bureau of Water MCLs, last amended on August 28, 2009.
3. Analytical results obtained from Pace Analytical Services, Inc. laboratory report: Project Duke Robinson 234758.
4. °C Degrees Celsius
5. mV indicates MilliVolts
6. SU indicates Standard Units.
7. umho/cm indicates micromhos per centimeter.
8. NA indicates not analyzed.
9. **Bold** indicates a concentration which attains or exceeds the corresponding SC DEHC Groundwater Standard.
10. Grey highlighted columns indicate monitoring wells screened in the ash basin.

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Table 5D. Groundwater monitoring well sample results – radiological isotopes

Parameter	Units	Sample Location								
		MW-7	MW-108S	MW-108D	MW-109S	MW-109D	MW-110S	MW-110D	MW-111S	MW-111D
Cesium - 137	pCi/L	U 0.857	U -0.709	U 0.679	UI 0.00	U 0.885	U -0.367	U -0.589	U 0.388	U -0.862
Cobalt - 60	pCi/L	U -1.53	U 3.67	U 3.08	U -2.21	U -3.21	U -0.0306	U 0.407	U -0.465	U 0.778

Notes:
1. Concentrations presented in picocuries per liter (pCi/L).
2. U indicates that analytes was analyzed for, but not detected above the MDL, MDA, or LOD.
3. UI indicates that uncertain identification via gamma spectroscopy.
4. Analytical results obtained from GEL Laboratories LLC.

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Table 6. Free water sample results – total inorganics and anions and cations

Parameter	Units	Sample Location Discharge Canal SS-1
Field Parameters		
Field pH	SU	6.0
Field Specific Conductance	umhos/cm	31.0
Field Temperature	°C	39.1
Dissolved Oxygen	mg/L	7.3
ORP (REDOX)	mV	223
Total Inorganics (Total Concs.)		
Antimony	µg/L	< 5.0
Arsenic	µg/L	< 10.0
Barium	µg/L	10.2
Beryllium	µg/L	< 1.0
Boron	µg/L	< 50.0
Cadmium	µg/L	< 1.0
Chromium	µg/L	< 5.0
Cobalt	µg/L	< 5.0
Copper	µg/L	< 5.0
Iron	µg/L	888
Lead	µg/L	< 5.0
Manganese	µg/L	17.8
Mercury	µg/L	< 0.20
Molybdenum	µg/L	< 5.0
Nickel	µg/L	< 5.0
Nitrogen, Nitrate	µg/L	< 20.0
Selenium	µg/L	< 10.0
Thallium	µg/L	< 1.0
Zinc	µg/L	< 10.0
Anions and Cations		
Alkalinity, Total as CaCO3	mg/L	< 5000
Bromide	mg/L	< 0.10
Calcium	µg/L	1120
Chloride	mg/L	2.8
Iron, Ferrous	mg/L	< 0.50
Magnesium	µg/L	511
Methane	µg/L	13.5
Nitrogen, Nitrate	µg/L	< 20.0
Potassium	µg/L	< 5000
Sodium	µg/L	< 5000
Sulfate	mg/L	2.2
Sulfide	mg/L	< 0.10
Total Dissolved Solids	mg/L	175
Total Inorganics (Dissolved)		
Antimony, Dissolved	µg/L	< 5.0
Arsenic, Dissolved	µg/L	< 10.0
Barium, Dissolved	µg/L	8.2
Beryllium, Dissolved	µg/L	< 1.0
Boron, Dissolved	µg/L	< 50.0
Cadmium, Dissolved	µg/L	< 1.0
Chromium, Dissolved	µg/L	< 5.0
Cobalt, Dissolved	µg/L	< 5.0
Copper, Dissolved	µg/L	< 5.0
Iron, Dissolved	µg/L	592
Lead, Dissolved	µg/L	< 5.0
Manganese, Dissolved	µg/L	13.2
Mercury, Dissolved	µg/L	< 0.20
Molybdenum, Dissolved	µg/L	< 5.0
Nickel, Dissolved	µg/L	< 5.0
Nitrogen, Nitrate	µg/L	< 20.0
Selenium, Dissolved	µg/L	< 10.0
Thallium, Dissolved	µg/L	< 1.0
Zinc, Dissolved	µg/L	< 10.0

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Table 7. Conceptual closure ash and earthwork quantities – Hybrid Cap-in-Place Closure Option

Location	Material	Quantity[1] cy
1960 Fill Area	Excavated Ash	275,800[2]
	Excavated Cover Soil	19,600[2]
	Excavated Impacted Soil	80,800[3]
Ash Basin	Excavated Ash Near Dam	510,100[4,6]
	Excavated Impacted Soil Near Dam	17,700[3,6]
	Perimeter Drainage Channel Excavation	429,100[4]
	2' Soil Cover	215,600[5]
	Ash Basin Embankment Fill	309,400[4]

Notes:
1. Quantities are in-place (bank measure) quantities without shrink or swell factors.
2. Source: AMEC, 2014
3. Assumes 2' of impacted soil over location footprint.
4. Volume generated using CAD.
5. Includes 18" soil cover and 6" topsoil.
6. Assumes ash and impacted soils will be removed from a setback of 200' measured from the centerline of the ash basin dam embankment to allow decommissioning.

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Table 8. Estimated quantity of material to be placed in ash basin – Hybrid Cap-in-Place Closure Option

Location	Material	Excavated Quantity[1] cy	Compaction Factor	Compacted Quantity cy
1960 Fill Area	Excavated Ash	275,800	20%	220,600
	Excavated Cover Soil	19,600	12%	17,200
	Excavated Impacted Soil	80,800	12%	71,100
Ash Basin	Excavated Ash Near Dam	510,100	20%	408,080
	Excavated Impacted Soil Near Embankment	17,700	12%	15,600
	Perimeter Drainage Channel Excavated Ash	107,300[2]	20%	85,800
	Perimeter Drainage Channel Excavated Impacted Soils	107,300[3]	12%	94,400
	2' Soil Cover	215,600	N/A	215,600
			TOTAL	1,128,400

Notes:
1. See Table 7 for notes.
2. Assumes 25% of material excavated from perimeter drainage channel is ash.
3. Assumes 25% of material excavated from perimeter drainage channel is impacted soil

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Table 9. Estimated quantity of material to be placed in ash landfill – On-Site and Off-Site Ash Landfill Closure Options

Location	Material	Excavated Quantity[1] cy	Compaction Factor	Compacted Quantity cy
1960 Fill Area	Excavated Ash	275,800	20%	220,600
	Excavated Cover Soil	19,600	12%	17,200
	Excavated Impacted Soil	80,800	12%	71,100
Ash Basin	Excavated Ash	3,000,000 to 3,500,000	20%	2,400,000 to 2,800,000
	Excavated Impacted Soil	233,300	12%	205,300
	2' Soil Cover[2]	215,600	N/A	161,300
			TOTAL	3,075,500 to 3,475,500

Notes:
1. See Table 7 for notes.
2. Assumes 50 acre landfill footprint.

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Appendices

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A

Appendix A

Site Survey from WSP

ROBINSON PLANT
DARLINGTON COUNTY, SOUTH CAROLINA
OVERALL SCHEMATIC

TOPOGRAPHIC AND PLANIMETRIC CERTIFICATION

I, DAVID K. BRUBAKER, CERTIFY THAT THIS PROJECT WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; THAT THIS AIRBORNE/GROUND SURVEY WAS PERFORMED AT THE 95 PERCENT CONFIDENCE LEVEL (2 SIGMA) TO MEET FEDERAL GEOGRAPHIC DATA COMMITTEE STANDARDS; THAT THE HORIZONTAL ACCURACY IS 1.25', THAT THE VERTICAL ACCURACY IS 1.00' INSIDE THE ASH MAPPING BOUNDARY; THAT THE VERTICAL ACCURACY IS 2.00' OUTSIDE OF THE ASH MAPPING BOUNDARY; AND THAT THE ORIGINAL DATA (FLIGHT) WAS OBTAINED ON JULY 27, 2014; THAT THE SURVEY WAS COMPLETED ON NOVEMBER 4, 2014; THAT CONTOURS SHOWN AS [BROKEN LINES] MAY NOT MEET THE STATED STANDARD; AND ALL COORDINATES ARE BASED ON NAD83; AND ALL ELEVATIONS ARE BASED ON NAVD 88.

MONITORING WELL CERTIFICATION

I, DAVID K. BRUBAKER, CERTIFY THAT THIS PROJECT WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; THAT THIS GROUND SURVEY WAS PERFORMED AT THE 95 PERCENT CONFIDENCE LEVEL (2 SIGMA) TO MEET FEDERAL GEOGRAPHIC DATA COMMITTEE STANDARDS; THAT THE MONITOR WELL LOCATION HORIZONTAL ACCURACY IS 0.10', AND THE VERTICAL ACCURACY IS 0.01', AND THAT THE BORING LOCATIONS HORIZONTAL ACCURACY IS 1.0' AND THE VERTICAL ACCURACY IS 0.10'; AND THAT THE ORIGINAL DATA (FIELD SURVEY) WAS OBTAINED IN OCTOBER & NOVEMBER OF 2104; THAT THE FIELD SURVEY WAS COMPLETED ON NOVEMBER 4, 2014; AND ALL COORDINATES ARE BASED ON NAD83; AND ALL ELEVATIONS ARE BASED ON NAVD 88.

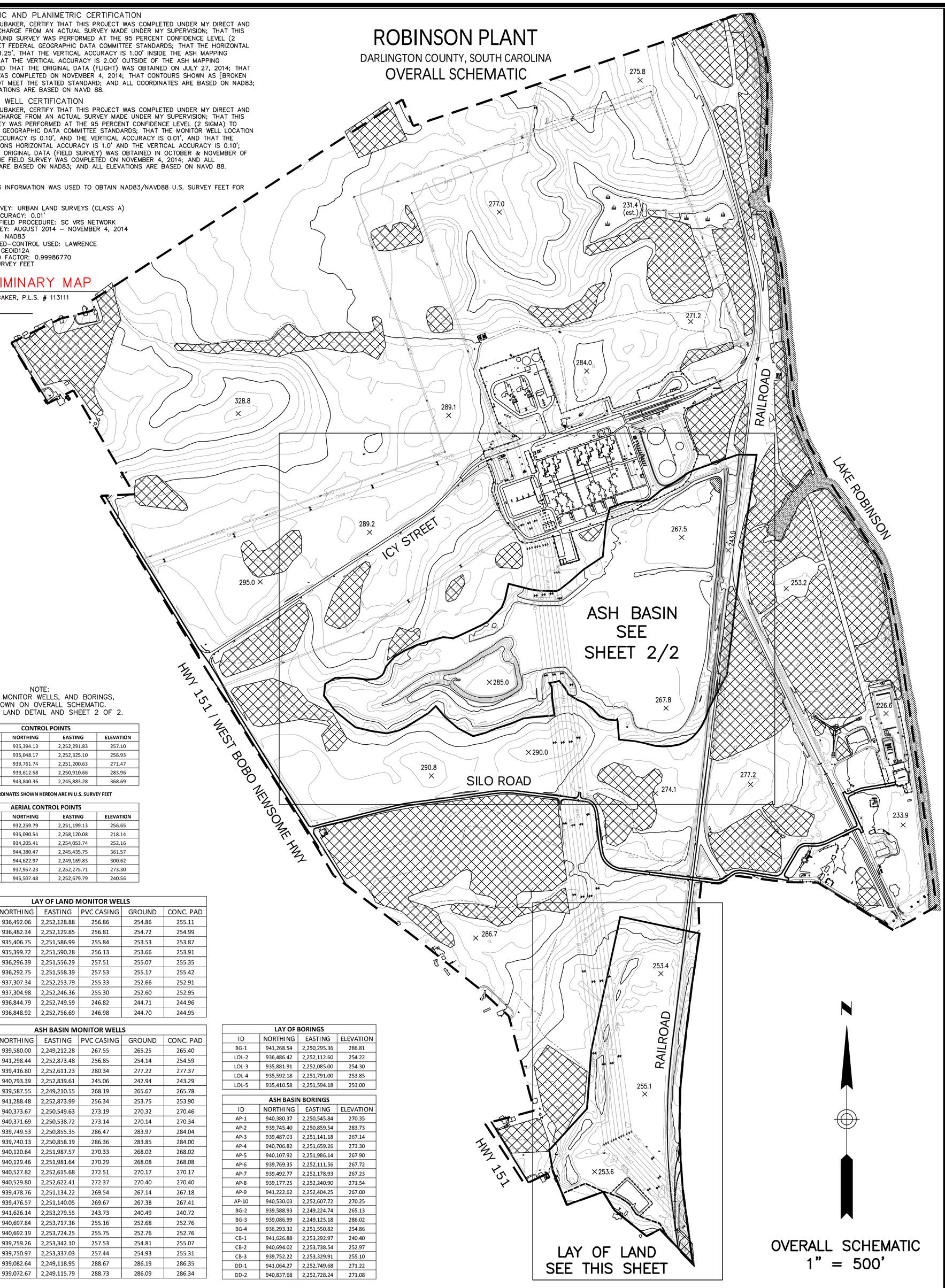
THE FOLLOWING INFORMATION WAS USED TO OBTAIN NAD83/NAVD88 U.S. SURVEY FEET FOR THIS PROJECT:

CLASS OF SURVEY: URBAN LAND SURVEYS (CLASS A)
POSITIONAL ACCURACY: 0.01'
TYPE OF GPS FIELD PROCEDURE: SC VRS NETWORK
DATE OF SURVEY: AUGUST 2014 – NOVEMBER 4, 2014
DATUM/EPOCH: NAD83
PUBLISHED/FIXED–CONTROL USED: LAWRENCE
GEOID MODEL: GEOID12A
COMBINED GRID FACTOR: 0.99986770
UNITS: U.S. SURVEY FEET

PRELIMINARY MAP

DAVID K. BRUBAKER, P.L.S. # 113111

DATE



NOTE:
CONTROL, MONITOR WELLS, AND BORINGS, NOT SHOWN ON OVERALL SCHEMATIC. SEE LAY OF LAND DETAIL AND SHEET 2 OF 2.

CONTROL POINTS

ID	NORTHING	EASTING	ELEVATION
TRV 1 NAIL	935,394.13	2,252,291.83	257.10
TRV 2 NAIL	935,048.17	2,252,325.10	256.93
TRV 12 REBAR	939,761.74	2,251,200.63	271.47
TRV 13 REBAR	939,612.58	2,250,910.66	283.96
NGS LAWRENCE	943,840.36	2,245,883.28	368.69

ALL COORDINATES SHOWN HEREON ARE IN U.S. SURVEY FEET

AERIAL CONTROL POINTS

ID	NORTHING	EASTING	ELEVATION
AT-1	932,259.79	2,251,199.13	256.65
AT-2	935,090.54	2,258,120.08	218.14
AT-3	934,205.41	2,254,053.74	252.16
AT-4	944,380.47	2,245,435.75	361.57
AT-5	944,622.97	2,249,169.83	300.62
AT-6	937,957.23	2,252,275.71	273.30
AT-7	945,507.48	2,252,679.79	240.56

LAY OF LAND MONITOR WELLS

ID	NORTHING	EASTING	PVC CASING	GROUND	CONC. PAD
MW-105S	936,492.06	2,252,128.88	256.86	254.86	255.11
MW-105D	936,482.34	2,252,129.85	256.81	254.72	254.99
MW-106S	935,406.75	2,251,586.99	255.84	253.53	253.87
MW-106D	935,399.72	2,251,590.28	256.13	253.66	253.91
MW-116S	936,296.39	2,251,556.29	257.51	255.07	255.35
MW-116D	936,292.75	2,251,558.39	257.53	255.17	255.42
MW-117S	937,307.34	2,252,253.79	255.33	252.66	252.91
MW-117D	937,304.98	2,252,246.36	255.30	252.60	252.95
MW-118S	936,844.79	2,252,749.59	246.82	244.71	244.96
MW-118D	936,848.92	2,252,756.69	246.98	244.70	244.95

ASH BASIN MONITOR WELLS

ID	NORTHING	EASTING	PVC CASING	GROUND	CONC. PAD
MW-1R	939,580.00	2,249,212.28	267.55	265.25	265.40
MW-2R	941,298.44	2,252,873.48	256.85	254.14	254.59
MW-3R	939,416.80	2,252,611.23	280.34	277.22	277.37
MW-7D	940,793.39	2,252,839.61	245.06	242.94	243.29
MW-101D	939,587.55	2,249,210.55	268.19	265.67	265.78
MW-102D	941,288.48	2,252,873.99	256.34	253.75	253.90
MW-107S	940,373.67	2,250,549.63	273.19	270.32	270.46
MW-107D	940,371.69	2,250,538.72	273.14	270.14	270.34
MW-108S	939,749.53	2,250,855.35	286.47	283.97	284.04
MW-108D	939,740.13	2,250,858.19	286.36	283.85	284.00
MW-109S	940,120.64	2,251,987.57	270.33	268.02	268.02
MW-109D	940,129.46	2,251,981.64	270.29	268.08	268.08
MW-110S	940,527.82	2,252,615.68	272.51	270.17	270.17
MW-110D	940,529.80	2,252,622.41	272.37	270.40	270.40
MW-111S	939,478.76	2,251,134.22	269.54	267.14	267.18
MW-111D	939,476.57	2,251,140.05	269.67	267.38	267.41
MW-112S	941,626.14	2,253,279.55	243.73	240.49	240.72
MW-113S	940,697.84	2,253,717.36	255.16	252.68	252.76
MW-113D	940,692.19	2,253,724.25	255.75	252.76	252.76
MW-114S	939,759.26	2,253,342.10	257.53	254.81	255.07
MW-114D	939,750.97	2,253,337.03	257.44	254.93	255.31
MW-115S	939,082.64	2,249,118.95	288.67	286.19	286.35
MW-115D	939,072.67	2,249,115.79	288.73	286.09	286.34

LAY OF BORINGS

ID	NORTHING	EASTING	ELEVATION
BG-1	941,268.54	2,250,295.36	286.81
LOL-2	936,486.42	2,252,112.60	254.22
LOL-3	935,881.91	2,252,085.00	254.30
LOL-4	935,592.18	2,251,791.00	253.85
LOL-5	935,410.58	2,251,594.18	253.00

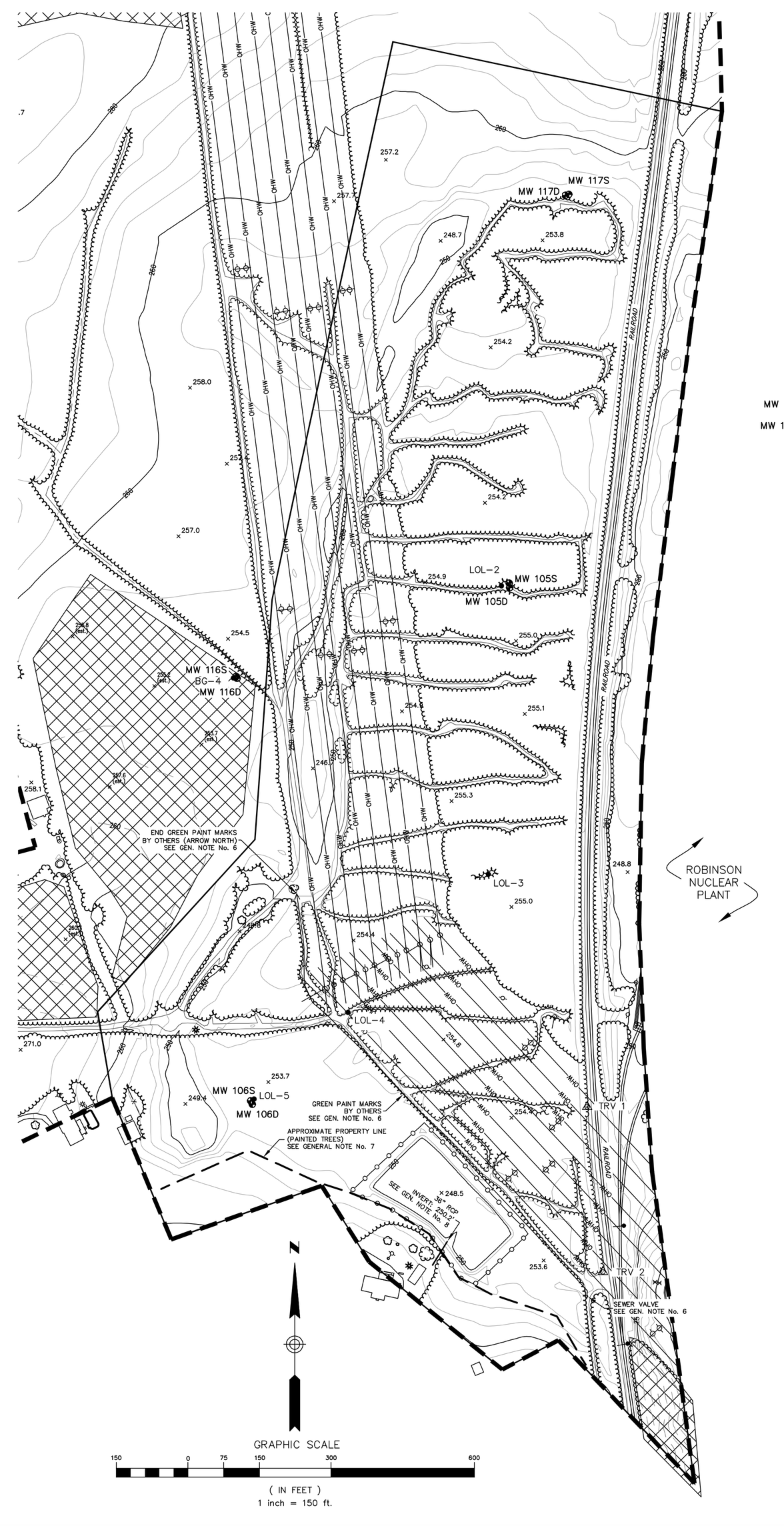
ASH BASIN BORINGS

ID	NORTHING	EASTING	ELEVATION
AP-1	940,380.37	2,250,545.84	270.35
AP-2	939,745.40	2,250,859.54	283.73
AP-3	939,487.03	2,251,141.18	267.14
AP-4	940,706.82	2,251,659.26	273.30
AP-5	940,107.92	2,251,986.14	267.90
AP-6	939,769.35	2,252,111.56	267.72
AP-7	939,492.77	2,252,178.93	267.23
AP-8	939,177.25	2,252,240.90	271.54
AP-9	941,222.62	2,252,404.25	267.00
AP-10	940,530.03	2,252,607.72	270.25
BG-2	939,588.93	2,249,224.74	265.13
BG-3	939,086.99	2,249,125.18	286.02
BG-4	936,293.32	2,251,550.82	254.86
CB-1	941,626.88	2,253,292.97	240.40
CB-2	940,694.02	2,253,738.54	252.97
CB-3	939,752.22	2,253,329.91	255.10
DD-1	941,064.27	2,252,749.68	271.22
DD-2	940,837.68	2,252,728.24	271.08

N

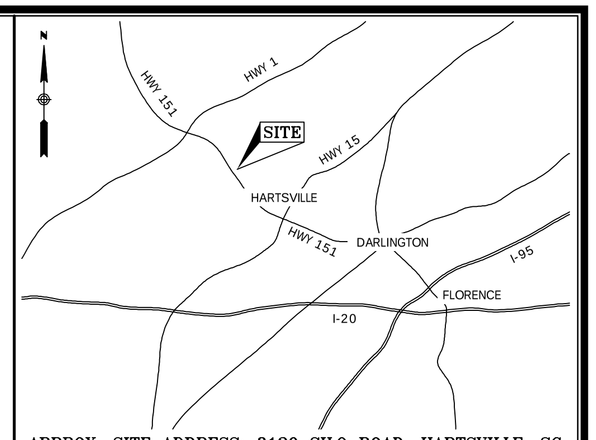
OVERALL SCHEMATIC
1" = 500'

LAY OF LAND



N

GRAPHIC SCALE
150 0 75 150 300 600
(IN FEET)
1 inch = 150 ft.



APPROX. SITE ADDRESS: 8120 SILO ROAD, HARTSVILLE, SC

VICINITY MAP (NOT TO SCALE)

LEGEND

- MAPPING LIMITS
- ASH BOUNDARY MAPPING LIMITS
- TREE LINE
- BRUSH LINE
- OHW — OVERHEAD UTILITY LINES
- UTILITY POLE
- MW 115S — MONITORING WELL
- AP–1, BG–1, CB–1, DD–1, LOL–2 — BORING
- UNIDENTIFIED OBJECT#
- 5FT WIRE MESH FENCE
- RIP RAP
- NA — MONITORING WELL NOT SURVEYED
- DRAINAGE DITCH CENTER LINE
- 281.3 — SPOT ELEVATION
- 279.3 (est.) — ESTIMATED SPOT ELEVATION
- TRV 1 — CONTROL POINT
- DIRT PATH
- 6FT CHAINLINK FENCE
- S — GREEN PAINT MARKS BY OTHERS
- OBSCURED AREA – SEE NOTE 4

#UNIDENTIFIED OBJECTS FROM AERIAL MAPPING; SYMBOLS SHOWN WITHIN THE ASH BASIN ARE SPRINKLERS.

GENERAL NOTES

1. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCE IN U.S. SURVEY FEET UNLESS OTHERWISE NOTED.
2. BASIS OF BEARINGS: NAD83.
3. VERTICAL DATUM: NAVD88.
4. CONTOUR INTERVAL INSIDE ASH MAPPING BOUNDARY IS 2'. CONTOUR INTERVAL OUTSIDE OF ASH MAPPING BOUNDARY IS 4'. DASHED CONTOURS OUTSIDE OF ASH MAPPING BOUNDARY IN THE OBSCURED AREAS ARE FOR REFERENCE ONLY AND HAVE NOT BEEN FIELD VERIFIED.
5. A PORTION OF THE PLANIMETRIC LOCATION SHOWN ON THIS MAP IS BASED ON PHOTOGRAMMETRIC MAPPING OF IMAGERY COLLECTED ON JULY 27, 2014. THE IMAGERY CAPTURED IS SUITABLE TO CREATE 1" = 100 SCALE MAPPING AND CONTOURS AT AN INTERVAL OF 2' AND 4'. THE MAPPING MEETS NATIONAL MAP ACCURACY STANDARDS FOR 100 SCALE MAPPING. DATA PROVIDED WHERE CLEAR AND VISIBLE ON THE IMAGERY IS WITHIN 2' OF ITS TRUE POSITION.
6. LOCATION OF UTILITIES WHETHER PUBLIC OR PRIVATE, IS BASED UPON FIELD LOCATION OF VISIBLE APPURTENANCES IN CONJUNCTION WITH INFORMATION PROVIDED BY THE OWNERS OF SAID UTILITIES AND ARE APPROXIMATE ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY LOCATION PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION. WSP CANNOT ASSUME RESPONSIBILITY FOR MISIDENTIFICATION OR OMISSION OF UNDERGROUND UTILITIES. DUE TO OSHA REQUIREMENTS PERTAINING TO CONFINED SPACE ENTRY, PIPE SIZES, INVERT ELEVATIONS, ETC., WILL ONLY BE PROVIDED IF FIELD PERSONNEL ARE ABLE TO OBTAIN WITHOUT BREAKING THE PLANE OF THE TOP OF THE STRUCTURE.
7. APPROXIMATE PROPERTY LINE SHOWN IN THE LAY OF LAND AREA IS BASED ON FIELD EVIDENCE OF PAINTED TREES AND MONUMENTATION. THIS SURVEY IS NOT A BOUNDARY SURVEY.
8. NO SOURCE FOR THE 36"RCP WAS FOUND DURING THE SURVEY.

REVISION

DATE	DESCRIPTION
12/01/2014	ADDITIONAL AREA

ROBINSON PLANT
ASH BASIN CLOSER PROJECT
DARLINGTON COUNTY, SOUTH CAROLINA
PREPARED FOR
HDR ENGINEERING, INC.

WSP
Transportation & Infrastructure
www.wspgroup.com

Drawn By	JMS	Date	Job No.
Surveyed By	JMS	NOVEMBER 13, 2014	1470021
Checked By	DKB	Scale	Sheet No.
Book No.	ROBINSON01	1" = 500' / 150'	1 OF 2

LAY OF LAND MONITOR WELLS					
ID	NORTHING	EASTING	PVC CASING	GROUND	CONC. PAD
MW-105S	936,492.06	2,252,128.88	256.86	254.86	255.11
MW-105D	936,482.34	2,252,129.85	256.81	254.72	254.99
MW-106S	935,406.75	2,251,586.99	255.84	253.53	253.87
MW-106D	935,399.72	2,251,590.28	256.13	253.66	253.91
MW-116S	936,296.39	2,251,556.29	257.51	255.07	255.35
MW-116D	936,292.75	2,251,558.39	257.53	255.17	255.42
MW-117S	937,307.34	2,252,253.79	255.33	252.66	252.91
MW-117D	937,304.98	2,252,246.36	255.30	252.60	252.95
MW-118S	936,844.79	2,252,749.59	246.82	244.71	244.96
MW-118D	936,848.92	2,252,756.69	246.98	244.70	244.95

ASH BASIN MONITOR WELLS					
ID	NORTHING	EASTING	PVC CASING	GROUND	CONC. PAD
MW-1R	939,580.00	2,249,212.28	267.55	265.25	265.40
MW-2R	941,298.44	2,252,873.48	256.85	254.14	254.59
MW-3R	939,416.80	2,252,611.23	280.34	277.22	277.37
MW-7D	940,793.39	2,252,839.61	245.06	242.94	243.29
MW-101D	939,587.55	2,249,210.55	268.19	265.67	265.78
MW-102D	941,288.48	2,252,873.99	256.34	253.75	253.90
MW-107S	940,373.67	2,250,549.63	273.19	270.32	270.46
MW-107D	940,371.69	2,250,538.72	273.14	270.14	270.34
MW-108S	939,749.53	2,250,855.35	286.47	283.97	284.04
MW-108D	939,740.13	2,250,858.19	286.36	283.85	284.00
MW-109S	940,120.64	2,251,987.57	270.33	268.02	268.02
MW-109D	940,129.46	2,251,981.64	270.29	268.08	268.08
MW-110S	940,527.82	2,252,615.68	272.51	270.17	270.17
MW-110D	940,529.80	2,252,622.41	272.37	270.40	270.40
MW-111S	939,478.76	2,251,134.22	269.54	267.14	267.18
MW-111D	939,476.57	2,251,140.05	269.67	267.38	267.41
MW-112S	941,626.14	2,253,279.55	243.73	240.49	240.72
MW-113S	940,697.84	2,253,717.36	255.16	252.68	252.76
MW-113D	940,692.19	2,253,724.25	255.75	252.76	252.76
MW-114S	939,759.26	2,253,342.10	257.53	254.81	255.07
MW-114D	939,750.97	2,253,337.03	257.44	254.93	255.31
MW-115S	939,082.64	2,249,118.95	288.67	286.19	286.35
MW-115D	939,072.67	2,249,115.79	288.73	286.09	286.34

PRELIMINARY

LAY OF BORINGS			
ID	NORTHING	EASTING	ELEVATION
BG-1	941,268.54	2,250,295.36	286.81
LOL-2	936,486.42	2,252,112.60	254.22
LOL-3	935,881.91	2,252,085.00	254.30
LOL-4	935,592.18	2,251,791.00	253.85
LOL-5	935,410.58	2,251,594.18	253.00

ASH BASIN BORINGS			
ID	NORTHING	EASTING	ELEVATION
AP-1	940,380.37	2,250,545.84	270.35
AP-2	939,745.40	2,250,859.54	283.73
AP-3	939,487.03	2,251,141.18	267.14
AP-4	940,706.82	2,251,659.26	273.30
AP-5	940,107.92	2,251,986.14	267.90
AP-6	939,769.35	2,252,111.56	267.72
AP-7	939,492.77	2,252,178.93	267.23
AP-8	939,177.25	2,252,240.90	271.54
AP-9	941,222.62	2,252,404.25	267.00
AP-10	940,530.03	2,252,607.72	270.25
BG-2	939,588.93	2,249,224.74	265.13
BG-3	939,086.99	2,249,125.18	286.02
BG-4	936,293.32	2,251,550.82	254.86
CB-1	941,626.88	2,253,292.97	240.40
CB-2	940,694.02	2,253,738.54	252.97
CB-3	939,752.22	2,253,329.91	255.10
DD-1	941,064.27	2,252,749.68	271.22
DD-2	940,837.68	2,252,728.24	271.08

CONTROL POINTS			
ID	NORTHING	EASTING	ELEVATION
TRV 1 NAIL	935,394.13	2,252,291.83	257.10
TRV 2 NAIL	935,048.17	2,252,325.10	256.93
TRV 12 REBAR	939,761.74	2,251,200.63	271.47
TRV 13 REBAR	939,612.58	2,250,910.66	283.96
NGS LAWRENCE	943,840.36	2,245,883.28	368.69

ALL COORDINATES SHOWN HEREON ARE IN U.S. SURVEY FEET

AERIAL CONTROL POINTS			
ID	NORTHING	EASTING	ELEVATION
AT-1	932,259.79	2,251,199.13	256.65
AT-2	935,090.54	2,258,120.08	218.14
AT-3	934,205.41	2,254,053.74	252.16
AT-4	944,380.47	2,245,435.75	361.57
AT-5	944,622.97	2,249,169.83	300.62
AT-6	937,957.23	2,252,275.71	273.30
AT-7	945,507.48	2,252,679.79	240.56

NOTE: SEE SHEET 1 OF 2 FOR GENERAL NOTES, AND OVERALL SCHEMATIC.

REVISION	
DATE	DESCRIPTION
12/01/2014	ADDITIONAL AREA

ROBINSON PLANT

ASH BASIN CLOSURE PROJECT

DARLINGTON COUNTY, SOUTH CAROLINA

PREPARED FOR

HDR ENGINEERING, INC.

WSP

Transportation & Infrastructure

15401 Weston Parkway, Suite 100 • Cary, NC 27513 • 919.678.0035

www.wspgroup.com

Drawn By	JMS	Date	Job No.
Surveyed By	JMS	NOVEMBER 13, 2014	1470021
Checked By	DKB	Scale	Sheet No.
Book No.	ROBINSON01	1" = 150'	2 OF 2

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B

Appendix B

Natural Resources Survey Forms

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WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No _____	**Is the Sampled Area within a Wetland?** **Yes _____ No _____**
Hydric Soil Present?	Yes _____	No _____	
Wetland Hydrology Present?	Yes _____	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No _____	Depth (inches): _____
Water Table Present?	Yes _____	No _____	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No _____	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Sapling Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	_____	x 1 = _____
FACW species	_____	x 2 = _____
FAC species	_____	x 3 = _____
FACU species	_____	x 4 = _____
UPL species	_____	x 5 = _____
Column Totals:	_____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks: (If observed, list morphological adaptations below).

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SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** _____

Remarks:

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WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No _____	**Is the Sampled Area within a Wetland?** **Yes _____ No _____**
Hydric Soil Present?	Yes _____	No _____	
Wetland Hydrology Present?	Yes _____	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No _____	Depth (inches): _____
Water Table Present?	Yes _____	No _____	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No _____	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Sapling Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	_____	x 1 = _____
FACW species	_____	x 2 = _____
FAC species	_____	x 3 = _____
FACU species	_____	x 4 = _____
UPL species	_____	x 5 = _____
Column Totals:	_____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks: (If observed, list morphological adaptations below).

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SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** _____

Remarks:

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WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: _____ City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: _____

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: VaB - Vaucluse loamy sand, 2 to 6% slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No _____	**Is the Sampled Area within a Wetland?** **Yes _____ No _____**
Hydric Soil Present?	Yes _____	No _____	
Wetland Hydrology Present?	Yes _____	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No _____	Depth (inches): _____
Water Table Present?	Yes _____	No _____	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No _____	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Sapling Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
50% of total cover: _____	20% of total cover: _____		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	_____	x 1 = _____
FACW species	_____	x 2 = _____
FAC species	_____	x 3 = _____
FACU species	_____	x 4 = _____
UPL species	_____	x 5 = _____
Column Totals:	_____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks: (If observed, list morphological adaptations below).

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SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** _____

Remarks:

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C

Appendix C

Conceptual Design Drawings

N

NOTES:

1. BASE MAP PROVIDED BY WSP TRANSPORTATION AND INFRASTRUCTURE DATED NOVEMBER 13, 2014 BASED ON PHOTOGRAMMETRIC MAPPING COLLECTED ON JULY 27, 2014.
2. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCE IN U.S. SURVEY FEET UNLESS OTHERWISE NOTED.
3. BASIS OF BEARINGS: NAD83.
4. VERTICAL DATUM: NAVD88.
5. LIMITS OF '1960 FILL AREA' ASH STORAGE AREA OBTAINED FROM DRAWING ENTITLED 'ROBINSON STEAM PLANT LAY OF LAND AREA ASH THICKNESS ISOPACH' DATED AUGUST 20, 2014 BY AMEC ENVIRONMENT AND INFRASTRUCTURE.

LEGEND

- APPROXIMATE LIMITS OF EXISTING ASH
- OVERHEAD UTILITY LINES
- UTILITY POLE
- MW 115S — MONITORING WELL
- AP-1, BG-1, CB-1, DD-1, LOL-2 — BORING
- UNIDENTIFIED OBJECT
- 5FT WIRE MESH FENCE
- RIP RAP
- NA — MONITORING WELL NOT SURVEYED
- DRAINAGE DITCH CENTER LINE
- × 281.3 SPOT ELEVATION
- × 279.3 (est.) ESTIMATED SPOT ELEVATION
- TRV 1 CONTROL POINT
- DIRT PATH
- 6FT CHAINLINK FENCE
- GREEN PAINT MARKS BY OTHERS
- OBSCURED AREA
- EXISTING MINOR CONTOUR
- 260 — EXISTING MAJOR CONTOUR

HDR Engineering, Inc. of the Carolinas

N.C.B.E.L.S. License Number: F-0116

440 S. Church Street, Suites 900 & 1000
Charlotte, NC 28202-2075
704.338.6700

ISSUE	DATE	DESCRIPTION
A	12/2014	ISSUED FOR APPROVAL

PROJECT MANAGER	M. FILARDI, P.G.
PROJECT ENGINEER	T. YANOSCHAK, P.E.
STRUCTURAL	
PLUMBING	
ELECTRICAL	
DRAWN BY	L. MCCAUL
PROJECT NUMBER	011237-243758-012

SOUTH CAROLINA HDR ENGINEERING, INC. OF THE CAROLINAS No. C0318 CERTIFICATE OF AUTHORIZATION

NOT FOR CONSTRUCTION

DUKE ENERGY.

Duke Energy Progress

Robinson Plant
Ash Basin Closure Project

DARLINGTON COUNTY SOUTH CAROLINA

EXISTING CONDITIONS

0 1" 2"

FILENAME 01G-01.dwg
SCALE 1" = 500'

SHEET 01G-01

C:\pwworking\pdx\d0337810\01G-01.dwg, Plot, 12/22/2014 2:24:31 PM, lmccaul

N

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3. BASIS OF BEARINGS: NAD83.
4. VERTICAL DATUM: NAVD88.
5. LIMITS OF '1960 FILL AREA' ASH STORAGE AREA AND ESTIMATED EXCAVATION DEPTHS OBTAINED FROM DRAWING ENTITLED 'ROBINSON STEAM PLANT LAY OF LAND AREA ASH THICKNESS ISOPACH' DATED AUGUST 20, 2014 BY AMEC ENVIRONMENT AND INFRASTRUCTURE.

LEGEND

- APPROXIMATE LIMITS OF EXISTING ASH
- OVERHEAD UTILITY LINES
- UTILITY POLE
- MW 115S — MONITORING WELL
- AP-1, BG-1, CB-1, DD-1, LOL-2 — BORING
- UNIDENTIFIED OBJECT
- 5FT WIRE MESH FENCE
- RIP RAP
- NA — MONITORING WELL NOT SURVEYED
- DRAINAGE DITCH CENTER LINE
- × 281.3 SPOT ELEVATION
- × 279.3 (est.) ESTIMATED SPOT ELEVATION
- TRV 1 CONTROL POINT
- DIRT PATH
- 6FT CHAINLINK FENCE
- GREEN PAINT MARKS BY OTHERS
- OBSCURED AREA
- EXISTING MINOR CONTOUR
- 260 — EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- 240 — PROPOSED MAJOR CONTOUR

HDR

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DARLINGTON COUNTY SOUTH CAROLINA

1960 FILL AREA ESTIMATED POST-EXCAVATION GRADES

0 1" 2"

FILENAME 01C-01.dwg
SCALE 1" = 200'

SHEET **01C-01**

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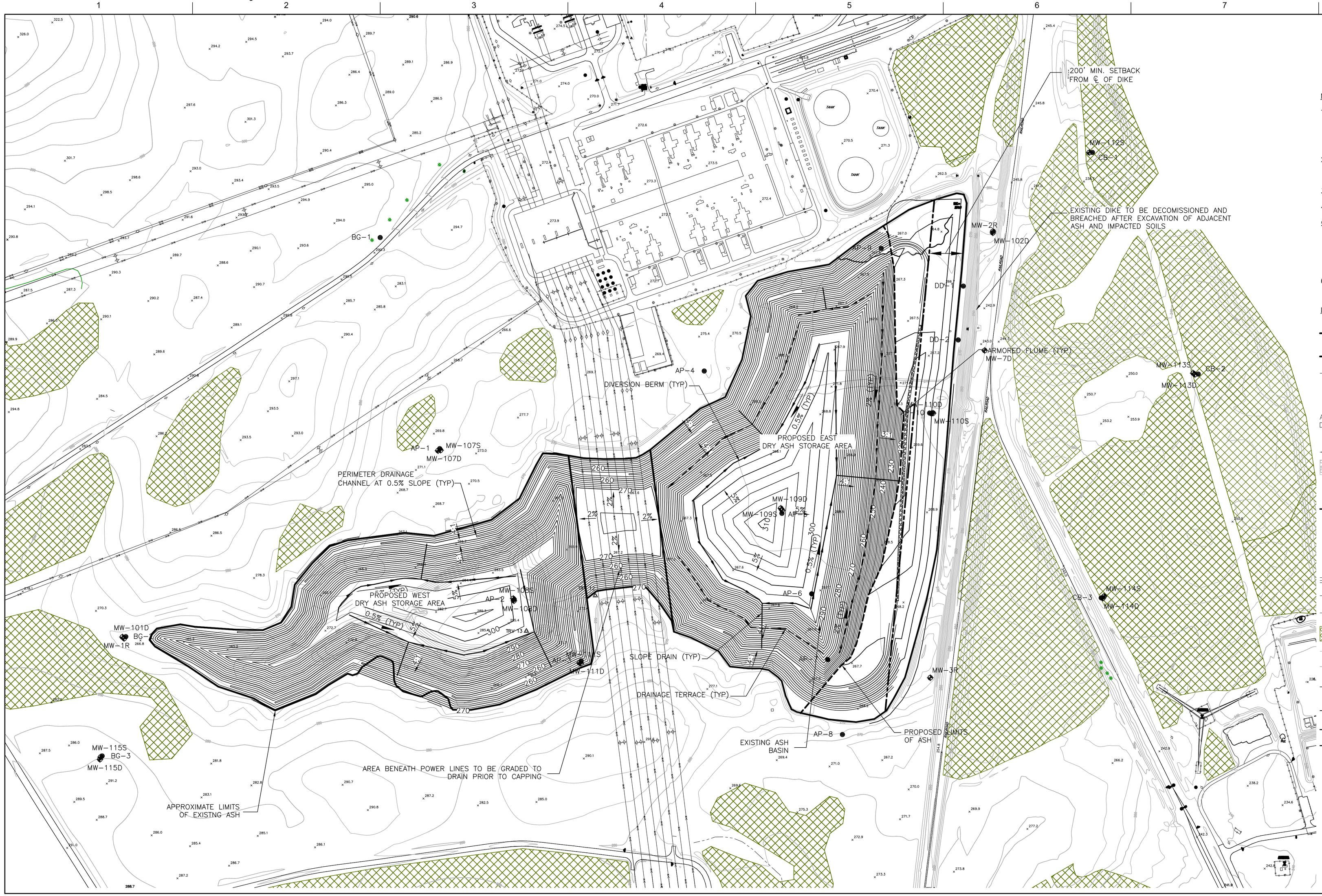
EXHIBIT DJW - 7.2
Page 89 of 90



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6. PROPOSED CONTOURS REPRESENT TOP OF FINAL COVER.

LEGEND

- APPROXIMATE LIMITS OF EXISTING ASH
- PROPOSED LIMITS OF ASH
- OVERHEAD UTILITY LINES
- UTILITY POLE
- MW 115S MONITORING WELL
- AP-1, BG-1, CB-1, DD-1, LOL-2 BORING
- UNIDENTIFIED OBJECT
- 5FT WIRE MESH FENCE
- RIP RAP
- NA MONITORING WELL NOT SURVEYED
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- × 279.3 (est.) ESTIMATED SPOT ELEVATION
- TRV 1 CONTROL POINT
- DIRT PATH
- 6FT CHAINLINK FENCE
- GREEN PAINT MARKS BY OTHERS
- OBSCURED AREA
- EXISTING MINOR CONTOUR
- 260 EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- 240 PROPOSED MAJOR CONTOUR
- DIVERSION BERM
- DRAINAGE TERRACE

HDR

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Ash Basin Closure Project

DARLINGTON COUNTY SOUTH CAROLINA

CONCEPTUAL ASH BASIN CLOSURE DESIGN

0 1" 2"

FILENAME 01C-02.dwg
SCALE 1" = 200'

SHEET 01C-02

C:\pwworking\psi\d0539781101\C-02.dwg, Plot, 12/22/2014 8:59:42 AM, lmccaul