EDEN NORTH CAROLINA COAL ASH SPILL
SURFACE WATER RESULTS

NOTE: The data below represents surface water samples that were collected on Feb 15, 2014 by EPA SESD (Team 2). Water sample measurements are in milligrams per liter (mg/L) and/or micrograms per liter (µg/L) for these samples. The data is being compared to EPA ecological risk screening levels (ERSLs) to protect aquatic life in the surface water of the Dan River. Specific qualifiers and footnotes are listed below the summary table. These samples were collected at various locations along the river (refer to map for generalized locations). The detected concentrations in surface water are all below the EPA ERSLs with the exception of aluminum and lead. EPA typically screens the surface water concentrations using total metals samples, because this is a conservative practice for screening. Because lead was not detected in any of the samples of the dissolved fraction of surface water (i.e., samples that were filtered to remove particulates), there is no threat of toxicity of lead to aquatic organisms. Additionally, when chemical concentrations exceed the screening values it doesn't mean there will be adverse health or ecological effects, but recommends further investigation may be needed.

Analyte	Ecological Screening Standard for Surface Water Samples[1]		Approximately 3.2 mile downstream of US Hwy 360 Bridge (John Randolph Blvd.)		Approximately 3.2 mile downstream of US Hwy 360 Bridge (John Randolph Blvd.)		Approximately 6.2 mile downstream of US Hwy 360 Bridge (John Randolph Blvd.)		Approximately 6.2 mile downstream of US Hwy 360 Bridge (John Randolph Blvd.)	
Sample Information										
Sample ID	-		DR34A-0214SW		DR34B-0214SW		DR35A-0214SW		DR35B-0214SW	
Date	-		02/15/2014		02/15/2014		02/15/2014		02/15/2014	
Time	-		1210		1220		1340		1350	
Status	-		Validation Complete		Validation Complete		Validation Complete		Validation Complete	
Media	-		Surface Water		Sediment-Water Interface		Surface Water		Sediment-Water Interface	
Approximate Depth in Feet (bws)	-		3.5		7		4		9	
Dissolved metals										
Aluminum	87	µg/L	100	µg/L	100U	µg/L	140	µg/L	130	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	1U	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Barium	220	µg/L	20	µg/L	21	µg/L	20	µg/L	21	µg/L
Beryllium	0.66	µg/L	0.5U	µg/L	0.5U	µg/L	0.5U	µg/L	0.5U	µg/L
Boron	360	µg/L	92	µg/L	97	µg/L	91	µg/L	93	µg/L
Cadmium	0.1	µg/L	0.08U	µg/L	0.08U	µg/L	0.08U	µg/L	0.08U	µg/L
Calcium	-	-	6,800	µg/L	7,100	µg/L	6,800	µg/L	6,900	µg/L
Chromium	25	µg/L	1.1U,J	µg/L	1.1U,J	µg/L	1.1U,J	µg/L	1.1U,J	µg/L
Cobalt	3	µg/L	5U	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Copper	3	µg/L	1U	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Iron	1,000	µg/L	240	µg/L	200	µg/L	270	µg/L	280	µg/L
Lead	0.59	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Magnesium	-	-	2,600	µg/L	2,700	µg/L	2,700	µg/L	2,700	µg/L
Manganese	200	µg/L	13	µg/L	12	µg/L	15	µg/L	18	µg/L
Mercury	12	ng/L	0.5U,J,QL-1	ng/L	0.91U,J,B-2,QL-1	ng/L	0.7U,J,B-2,QL-1	ng/L	0.78U,J,B-2,QL-1	ng/L
Molybdenum	800	µg/L	10U	µg/L	10U	µg/L	10U	µg/L	10U	µg/L
Nickel	17	µg/L	10U	µg/L	10U	µg/L	10U	µg/L	10U	µg/L
Potassium	53,000	µg/L	1,600	µg/L	1,700	µg/L	1,600	µg/L	1,700	µg/L
Selenium	5	µg/L	2U	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Silver	0.06	µg/L	0.012U,J	µg/L	0.012U,J	µg/L	0.012U,J	µg/L	0.012U,J	µg/L
Sodium	680,000	µg/L	9,500	µg/L	10,000	µg/L	9,300	µg/L	9,600	µg/L
Strontium	1,500	µg/L	66	µg/L	69	µg/L	65	µg/L	66	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Tin	73	µg/L	15U	µg/L	15U	µg/L	15U	µg/L	15U	µg/L
Titanium	-	-	5U	µg/L	5U	µg/L	6.1	µg/L	5.7	µg/L
Vanadium	27	µg/L	5U	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Yttrium	-	-	3U	µg/L	3U	µg/L	3U	µg/L	3U	µg/L
Zinc	39	µg/L	10U	µg/L	10U	µg/L	10U	µg/L	10U	µg/L

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Analyte	Ecological Screening Standard for Surface Water Samples[1]		Approximately 3.2 mile downstream of US Hwy 360 Bridge (John Randolph Blvd.)		Approximately 3.2 mile downstream of US Hwy 360 Bridge (John Randolph Blvd.)		Approximately 6.2 mile downstream of US Hwy 360 Bridge (John Randolph Blvd.)		Approximately 6.2 mile downstream of US Hwy 360 Bridge (John Randolph Blvd.)	
Sample Information										
Sample ID	-		DR34A-0214SW		DR34B-0214SW		DR35A-0214SW		DR35B-0214SW	
Date	-		02/15/2014		02/15/2014		02/15/2014		02/15/2014	
Time	-		1210		1220		1340		1350	
Status	-		Validation Complete		Validation Complete		Validation Complete		Validation Complete	
Media	-		Surface Water		Sediment-Water Interface		Surface Water		Sediment-Water Interface	
Total Metals										
Aluminum	2,000	µg/L	1,300	µg/L	1,400	µg/L	1,600	µg/L	1,800	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	1J,QR-2	µg/L	1.1J,QR-2	µg/L	1.1J,QR-2	µg/L	1.1J,QR-2	µg/L
Barium	220	µg/L	32	µg/L	34	µg/L	34	µg/L	35	µg/L
Beryllium	0.66	µg/L	0.5U	µg/L	0.5U	µg/L	0.5U	µg/L	0.5U	µg/L
Boron	360	µg/L	98	µg/L	100	µg/L	92	µg/L	92	µg/L
Cadmium	2	µg/L	0.5U	µg/L	0.5U	µg/L	0.5U	µg/L	0.5U	µg/L
Calcium	-	-	7,000	µg/L	7,200	µg/L	7,000	µg/L	6,900	µg/L
Chromium	29	µg/L	2J,Q-2	µg/L	1.8J,Q-2	µg/L	2.3J,Q-2	µg/L	2.4J,Q-2	µg/L
Cobalt	24	µg/L	5U	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Copper	3	µg/L	2.3	µg/L	2.5	µg/L	2.6	µg/L	2.8	µg/L
Iron	2,300	µg/L	1,700	µg/L	1,800	µg/L	2,000	µg/L	2,200	µg/L
Lead	0.6	µg/L	1.3	µg/L	1.4	µg/L	1.4	µg/L	1.6	µg/L
Magnesium	-	-	2,800	µg/L	2,800	µg/L	2,900	µg/L	2,900	µg/L
Manganese	200	µg/L	62	µg/L	77	µg/L	69	µg/L	75	µg/L
Mercury	12	ng/L	2.9J,QL-1	ng/L	3.2J,QL-1	ng/L	3.9J,QL-1	ng/L	3.9J,QL-1	ng/L
Molybdenum	-	-	10U	µg/L	10U	µg/L	10U	µg/L	10U	µg/L
Nickel	17	µg/L	10U	µg/L	10U	µg/L	10U	µg/L	10U	µg/L
Potassium	53,000	µg/L	1,800	µg/L	1,800	µg/L	1,800	µg/L	1,800	µg/L
Selenium	5	µg/L	2U	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Silver	0.06	µg/L	0.014J,Q-2	µg/L	0.013J,Q-2	µg/L	0.016J,Q-2	µg/L	0.012U,J	µg/L
Sodium	680,000	µg/L	9,600	µg/L	9,800	µg/L	9,200	µg/L	9,100	µg/L
Strontium	1,500	µg/L	72	µg/L	74	µg/L	70	µg/L	70	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Tin	73	µg/L	15U	µg/L	15U	µg/L	15U	µg/L	15U	µg/L
Titanium	-	-	70	µg/L	76	µg/L	85	µg/L	98	µg/L
Vanadium	27	µg/L	5U	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Yttrium	-	-	3U	µg/L	3U	µg/L	3U	µg/L	3U	µg/L
Zinc	39	µg/L	10U	µg/L	10U	µg/L	10U	µg/L	10U	µg/L
Classical/Nutrient Analyses										
Total Dissolved Solids	-	-	90	mg/L	91	mg/L	89	mg/L	89	mg/L
Total Suspended Solids	-	-	34	mg/L	35	mg/L	40	mg/L	45	mg/L

Notes

[1] Value obtained from the GL Tier 2 Values; National Recommended Water Quality Criteria; Suter and Tsao (1996); Reference condition for EcoRegion XI (25 percentile); NCDENR State Standards for surface water

EPA U.S. Environmental Protection Agency
µg/L micrograms per liter
mg/L milligrams per liter

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SURFACE WATER RESULTS

Analyte	Ecological Screening Standard for Surface Water Samples[1]		Approximately 8.6 mile downstream of US Hwy 360 Bridge (John Randolph Blvd.)		Approximately 8.6 mile downstream of US Hwy 360 Bridge (John Randolph Blvd.)		Approximately 0.4 mile SW of Staunton River State Park boat ramp	
Sample Information								
Sample ID	-		DR36A-0214SW		DR36B-0214SW		DR37A-0214SW	
Date	-		02/15/2014		02/15/2014		02/15/2014	
Time	-		1510		1520		1255	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Media	-		Surface Water		Sediment-Water Interface		Surface Water	
Approximate Depth in Feet (bws)	-		1.5		3		4	
Dissolved metals								
Aluminum	87	µg/L	140	µg/L	120	µg/L	100	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Barium	220	µg/L	21	µg/L	21	µg/L	23	µg/L
Beryllium	0.66	µg/L	0.5U	µg/L	0.5U	µg/L	0.5U	µg/L
Boron	360	µg/L	60	µg/L	63	µg/L	200	µg/L
Cadmium	0.1	µg/L	0.08U	µg/L	0.08U	µg/L	0.08U	µg/L
Calcium	-	-	6,000	µg/L	5,900	µg/L	9,400	µg/L
Chromium	25	µg/L	1.1U,J	µg/L	1.1U,J	µg/L	1.1U,J	µg/L
Cobalt	3	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Copper	3	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Iron	1,000	µg/L	340	µg/L	300	µg/L	280	µg/L
Lead	0.59	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Magnesium	-	-	2,300	µg/L	2,300	µg/L	3,600	µg/L
Manganese	200	µg/L	31	µg/L	31	µg/L	48	µg/L
Mercury	12	ng/L	0.67U,J,B-2,QL-1	ng/L	0.88U,J,B-2,QL-1	ng/L	0.53U,J,B-2,QL-1	ng/L
Molybdenum	800	µg/L	10U	µg/L	10U	µg/L	10U	µg/L
Nickel	17	µg/L	10U	µg/L	10U	µg/L	10U	µg/L
Potassium	53,000	µg/L	1,700	µg/L	1,700	µg/L	1,700	µg/L
Selenium	5	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Silver	0.06	µg/L	0.012U,J	µg/L	0.012U,J	µg/L	0.012U,J	µg/L
Sodium	680,000	µg/L	8,000	µg/L	8,100	µg/L	10,000	µg/L
Strontium	1,500	µg/L	53	µg/L	53	µg/L	76	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Tin	73	µg/L	15U	µg/L	15U	µg/L	15U	µg/L
Titanium	-	-	5.4	µg/L	5U	µg/L	5U	µg/L
Vanadium	27	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Yttrium	-	-	3U	µg/L	3U	µg/L	3U	µg/L
Zinc	39	µg/L	10U	µg/L	10U	µg/L	10U	µg/L

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Sample Information								
Sample ID	-		DR36A-0214SW		DR36B-0214SW		DR37A-0214SW	
Date	-		02/15/2014		02/15/2014		02/15/2014	
Time	-		1510		1520		1255	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Media	-		Surface Water		Sediment-Water Interface		Surface Water	
Total Metals								
Aluminum	2,000	µg/L	1,400	µg/L	1,600	µg/L	920	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	1U	µg/L	1U	µg/L	1.1J,QR-2	µg/L
Barium	220	µg/L	31	µg/L	34	µg/L	30	µg/L
Beryllium	0.66	µg/L	0.5U	µg/L	0.5U	µg/L	0.5U	µg/L
Boron	360	µg/L	61	µg/L	61	µg/L	200	µg/L
Cadmium	2	µg/L	0.5U	µg/L	0.5U	µg/L	0.5U	µg/L
Calcium	-	-	6,000	µg/L	6,100	µg/L	9,300	µg/L
Chromium	29	µg/L	1.9J,Q-2	µg/L	2.2J,Q-2	µg/L	1.2J,Q-2	µg/L
Cobalt	24	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Copper	3	µg/L	2	µg/L	2.4	µg/L	1.8	µg/L
Iron	2,300	µg/L	1,900	µg/L	2,200	µg/L	1,300	µg/L
Lead	0.6	µg/L	1.2	µg/L	1.4	µg/L	0.85	µg/L
Magnesium	-	-	2,400	µg/L	2,500	µg/L	3,600	µg/L
Manganese	200	µg/L	81	µg/L	100	µg/L	75	µg/L
Mercury	12	ng/L	3.9J,QL-1	ng/L	3.6J,QL-1	ng/L	2.3J,QL-1	ng/L
Molybdenum	-	-	10U	µg/L	10U	µg/L	10U	µg/L
Nickel	17	µg/L	10U	µg/L	10U	µg/L	10U	µg/L
Potassium	53,000	µg/L	1,700	µg/L	1,800	µg/L	1,800	µg/L
Selenium	5	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Silver	0.06	µg/L	0.012U,J	µg/L	0.012U,J	µg/L	0.012U,J	µg/L
Sodium	680,000	µg/L	7,700	µg/L	7,800	µg/L	10,000	µg/L
Strontium	1,500	µg/L	56	µg/L	57	µg/L	77	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Tin	73	µg/L	15U	µg/L	15U	µg/L	15U	µg/L
Titanium	-	-	69	µg/L	83	µg/L	47	µg/L
Vanadium	27	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Yttrium	-	-	3U	µg/L	3U	µg/L	3U	µg/L
Zinc	39	µg/L	10U	µg/L	10U	µg/L	10U	µg/L
Classical/Nutrient Analyses								
Total Dissolved Solids	-	-	84	mg/L	83	mg/L	100	mg/L
Total Suspended Solids	-	-	31	mg/L	35	mg/L	18	mg/L

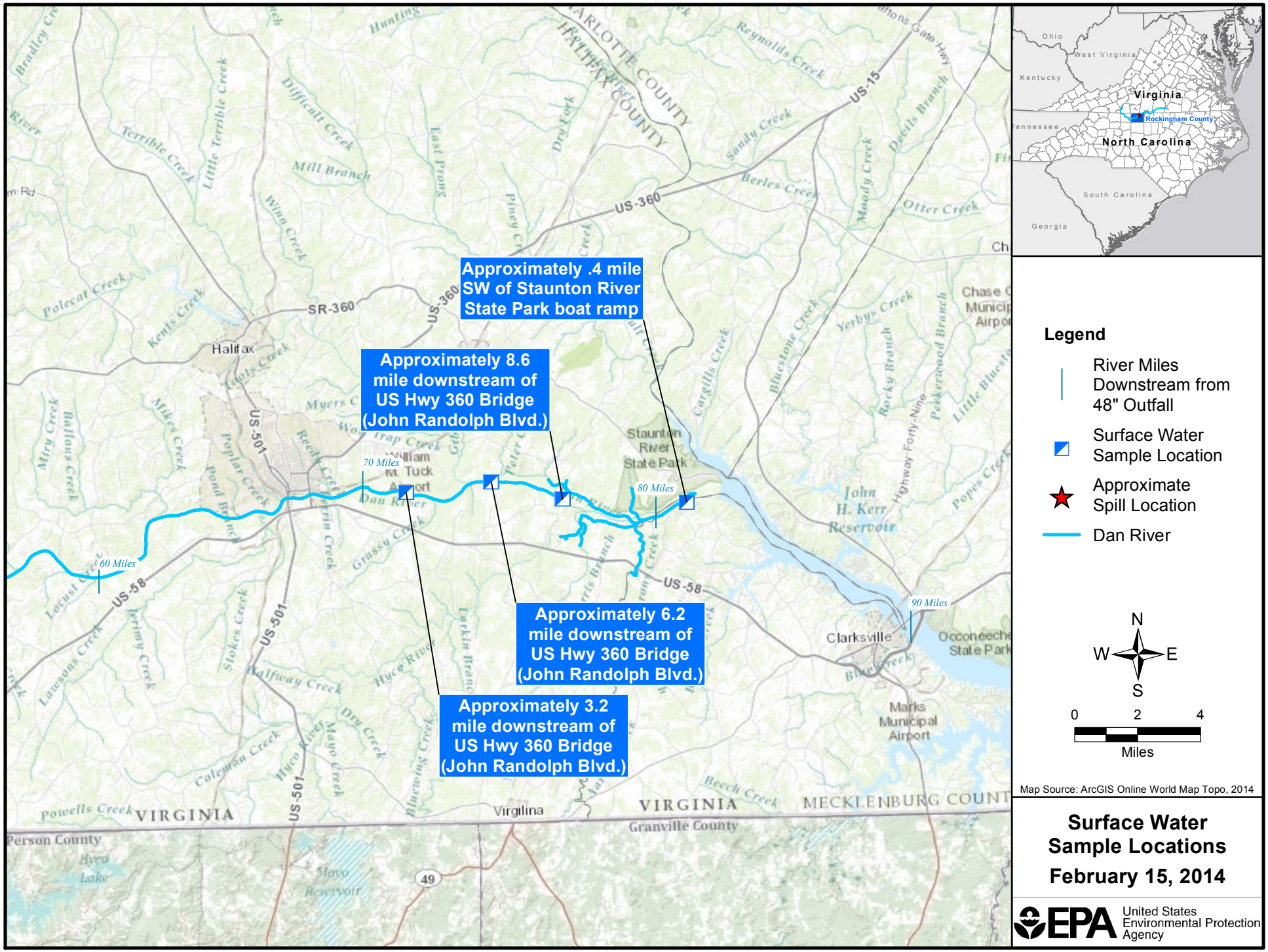
Notes

[1] Value obtained from the GL Tier 2 Values; National Recommended Water Quality Criteria; Suter and Tsao (1996); Reference condition for EcoRegion XI (25 percentile); NCDENR State Standards for surface water

EPA U.S. Environmental Protection Agency
µg/L micrograms per liter
mg/L milligrams per liter

DATA QUALIFIER DEFINITIONS

B-2	Reporting level elevated due to trace amounts of analyte present in the method blank
B-3	Level in blank does not impact data quality
B-4	Level in blank impacts MRLs
B-5	Qualitative evidence of contamination in the blank at a concentration less than the MDL
C-2	Improper sample container used
H-1	Recommended holding time exceeded
J	The identification of the analyte is acceptable; the reported value is an estimate
MRL-1	MRL verification for Potable Water matrix (Drinking Water)
MRL-2	MRL verification for Non-Potable Water matrix
MRL-3	MRL verification for Soil matrix
MRL-6	MRL verification for Waste matrix
N	There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification
NA-5	Not Analyzed. Cannot exceed TCLP regulatory levels based on Total Scan analyses
NA-9	Not Analyzed. No sample container received.
NJ	Presumptive evidence that the analyte is present; reported as a tentative identification with an estimated value
P-6	Incorrect reagent or technique used to preserve sample
Q-2	Result greater than MDL but less than MRL
QC-1	Analyte concentration low in continuing calibration verification standard
QC-2	Analyte concentration high in continuing calibration verification standard
QC-5	Calibration check standard less than method control limits
QC-6	Calibration check standard greater than method control limits
QI-1	Internal standard was outside of method control limits
QL-1	Laboratory Control Spike Recovery less than method control limits
QL-2	Laboratory Control Spike Recovery greater than method control limits
QL-3	Laboratory Control Spike Precision outside of method control limits
QM-1	Matrix Spike Recovery less than method control limits
QM-2	Matrix Spike Recovery greater than method control limits
QM-3	Matrix Spike Precision outside method control limits
QR-1	MRL verification recovery less than lower control limits
QR-2	MRL verification recovery greater than upper control limits
TIC	Tentatively Identified Compound - AN analyte identified based on a match with the instrument software's mass spectral library. A calibration standard has not been analyzed to confirm the compound's identification or the estimated concentration reported.
U	The analyte was not detected at or above the reporting limit
XD-2	Duplicate results less than 5X MRL
XM-1	Sample background/spike ratio higher than method evaluation criteria



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