

EDEN NORTH CAROLINA COAL ASH SPILL SEDIMENT-WATER INTERFACE RESULTS

NOTE: The data below represents sediment-water interface samples that were collected on April 28, 2014 by EPA START (Team 1) sampling teams. 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 sediment-water interface are all below the EPA ERSLs with the exception of aluminum, cadmium, and lead. 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		Transect EPA 12 Right Descending		Transect EPA 13 Mid-Channel		Transect EPA 14 Right Descending (upstream)	
Sample Information								
Sample ID	-		EDEN-EPA12-R-SW-20140428		EDEN-EPA13-C-SW-20140428		EDEN-EPA14-R-UP-SW-20140428	
Date	-		04/28/2014		04/28/2014		04/28/2014	
Time	-		0925		1130		1038	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
Dissolved metals								
Aluminum	87	µg/L	100	µg/L	190	µg/L	150	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	22	µg/L	24	µg/L	28	µg/L
Beryllium	0.66	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Boron	0.36	mg/L	0.059J	mg/L	0.062J	mg/L	0.058J	mg/L
Cadmium	0.1	µg/L	0.1U	µg/L	0.1U	µg/L	0.22J+	µg/L
Calcium	-	-	6,500	µg/L	6,800	µg/L	9,100	µg/L
Chromium	25	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Cobalt	3	µg/L	0.4U	µg/L	0.14J	µg/L	0.4U	µg/L
Copper	3	µg/L	0.71J	µg/L	0.87J	µg/L	0.95J	µg/L
Iron	1,000	µg/L	290	µg/L	410	µg/L	340	µg/L
Lead	0.59	µg/L	0.11J	µg/L	0.18J	µg/L	0.17J	µg/L
Magnesium	-	-	2,600	µg/L	2,600	µg/L	3,600	µg/L
Manganese	200	µg/L	2.6	µg/L	62	µg/L	2.5	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	800	µg/L	0.47J	µg/L	1J	µg/L	0.58J	µg/L
Nickel	17	µg/L	0.44J	µg/L	0.55J	µg/L	0.73J	µg/L
Potassium	53,000	µg/L	1,600	µg/L	1,700	µg/L	1,900	µg/L
Selenium	5	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Silver	0.06	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Sodium	680,000	µg/L	6,200	µg/L	5,800	µg/L	5,600	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.17J	µg/L	0.2U	µg/L
Vanadium	27	µg/L	0.8J	µg/L	1.2	µg/L	1.2	µg/L
Zinc	39	µg/L	20U	µg/L	20U	µg/L	20U	µg/L
Total Dissolved Solids								
Total Dissolved Solids	-	-	76	mg/L	75	mg/L	89	mg/L
Total Suspended Solids								
Total Suspended Solids	-	-	18	mg/L	34	mg/L	36	mg/L

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Sample Information								
Sample ID	-		EDEN-EPA12-R-SW-20140428		EDEN-EPA13-C-SW-20140428		EDEN-EPA14-R-UP-SW-20140428	
Date	-		04/28/2014		04/28/2014		04/28/2014	
Time	-		0925		1130		1038	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
Total Metals								
Aluminum	2,000	µg/L	180	µg/L	220	µg/L	220	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	25	µg/L	30	µg/L	36	µg/L
Beryllium	0.66	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Boron	0.36	mg/L	0.061J	mg/L	0.063J	mg/L	0.059J	mg/L
Cadmium	2	µg/L	0.1U	µg/L	0.1U	µg/L	0.21J+	µg/L
Calcium	-	-	6,800	µg/L	7,100	µg/L	9,400	µg/L
Chromium	29	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Cobalt	24	µg/L	0.26J	µg/L	0.5	µg/L	0.45	µg/L
Copper	3	µg/L	1	µg/L	1.3	µg/L	1.5	µg/L
Iron	2,300	µg/L	560	µg/L	790	µg/L	650	µg/L
Lead	0.6	µg/L	0.41	µg/L	0.66	µg/L	0.68	µg/L
Magnesium	-	-	2,700	µg/L	2,700	µg/L	3,700	µg/L
Manganese	200	µg/L	35	µg/L	130	µg/L	120	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	-	-	1U	µg/L	0.65J	µg/L	0.46J	µg/L
Nickel	17	µg/L	0.55J	µg/L	0.68J	µg/L	0.82J	µg/L
Potassium	53,000	µg/L	1,700	µg/L	1,800	µg/L	2,000	µg/L
Selenium	5	µg/L	2U	µg/L	2U	µg/L	2U	µg/L
Silver	0.06	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Sodium	680,000	µg/L	6,400	µg/L	5,900	µg/L	5,700	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	1.4	µg/L	1.9	µg/L	2.5	µg/L
Zinc	39	µg/L	2.8J	µg/L	20U	µg/L	2.9J	µg/L
Anions								
Bromide	-	-	68	µg/L	64	µg/L	55	µg/L
Chloride	230	mg/L	8.6	mg/L	8.1	mg/L	8.5	mg/L
Sulfate	-	-	7.2	mg/L	5.4	mg/L	6.5	mg/L

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Analyte	Ecological Screening Standard for Surface Water Samples ¹		Transect EPA 12 Right Descending		Transect EPA 13 Mid-Channel		Transect EPA 14 Right Descending (upstream)	
Sample Information								
Sample ID	-		EDEN-EPA12-R-SW-20140428		EDEN-EPA13-C-SW-20140428		EDEN-EPA14-R-UP-SW-20140428	
Date	-		04/28/2014		04/28/2014		04/28/2014	
Time	-		0925		1130		1038	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
Wet Chemistry								
Alkalinity, Total (As CaCO ₃)	-	-	28	mg/L	25	mg/L	31	mg/L
Hardness, Calcium/Magnesium (As CaCO ₃)	-	-	28	mg/L	29	mg/L	39	mg/L
Organic Carbon, Dissolved	-	-	1.7	mg/L	2.2	mg/L	2.9	mg/L
pH	6.5 - 9.0		std	7.41J	std	7.38J	std	7.47J

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

J Value is estimated

J+ Value is estimated with a possible high bias

J- Value is estimated with a possible low bias

µg/L micrograms per liter

mg/L milligrams per liter

std standard

U Analyte was not detected at the listed reporting limit.

**EDEN NORTH CAROLINA COAL ASH SPILL
SEDIMENT-WATER INTERFACE RESULTS**

Analyte	Ecological Screening Standard for Surface Water Samples ¹		Transect EPA 15 Right Descending	
Sample Information				
Sample ID	-		EDEN-EPA15-R-SW-20140428	
Date	-		04/28/2014	
Time	-		0933	
Status	-		Validation Complete	
Type	-		Sediment-Water Interface	
Dissolved metals				
Aluminum	87	μg/L	83	μg/L
Antimony	5.6	μg/L	1U	μg/L
Arsenic	10	μg/L	1U	μg/L
Barium	220	μg/L	25	μg/L
Beryllium	0.66	μg/L	0.4U	μg/L
Boron	0.36	mg/L	0.059J	mg/L
Cadmium	0.1	μg/L	0.1U	μg/L
Calcium	-	-	9,000	μg/L
Chromium	25	μg/L	2U	μg/L
Cobalt	3	μg/L	0.4U	μg/L
Copper	3	μg/L	0.82J	μg/L
Iron	1,000	μg/L	220	μg/L
Lead	0.59	μg/L	0.085J	μg/L
Magnesium	-	-	3,500	μg/L
Manganese	200	μg/L	1.5J	μg/L
Mercury	0.000012	mg/L	0.0002U	mg/L
Molybdenum	800	μg/L	0.53J	μg/L
Nickel	17	μg/L	0.57J	μg/L
Potassium	53,000	μg/L	1,900	μg/L
Selenium	5	μg/L	2U	μg/L
Silver	0.06	μg/L	1U	μg/L
Sodium	680,000	μg/L	5,400	μg/L
Thallium	0.24	μg/L	0.2U	μg/L
Vanadium	27	μg/L	0.93J	μg/L
Zinc	39	μg/L	20U	μg/L
Total Dissolved Solids				
Total Dissolved Solids	-	-	83	mg/L
Total Suspended Solids				
Total Suspended Solids	-	-	14	mg/L

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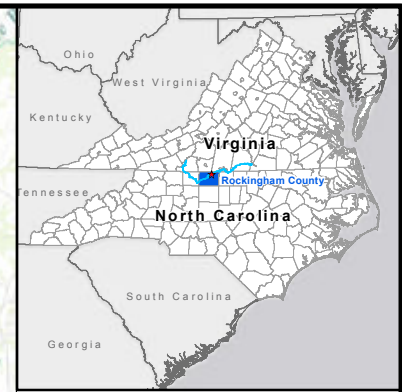
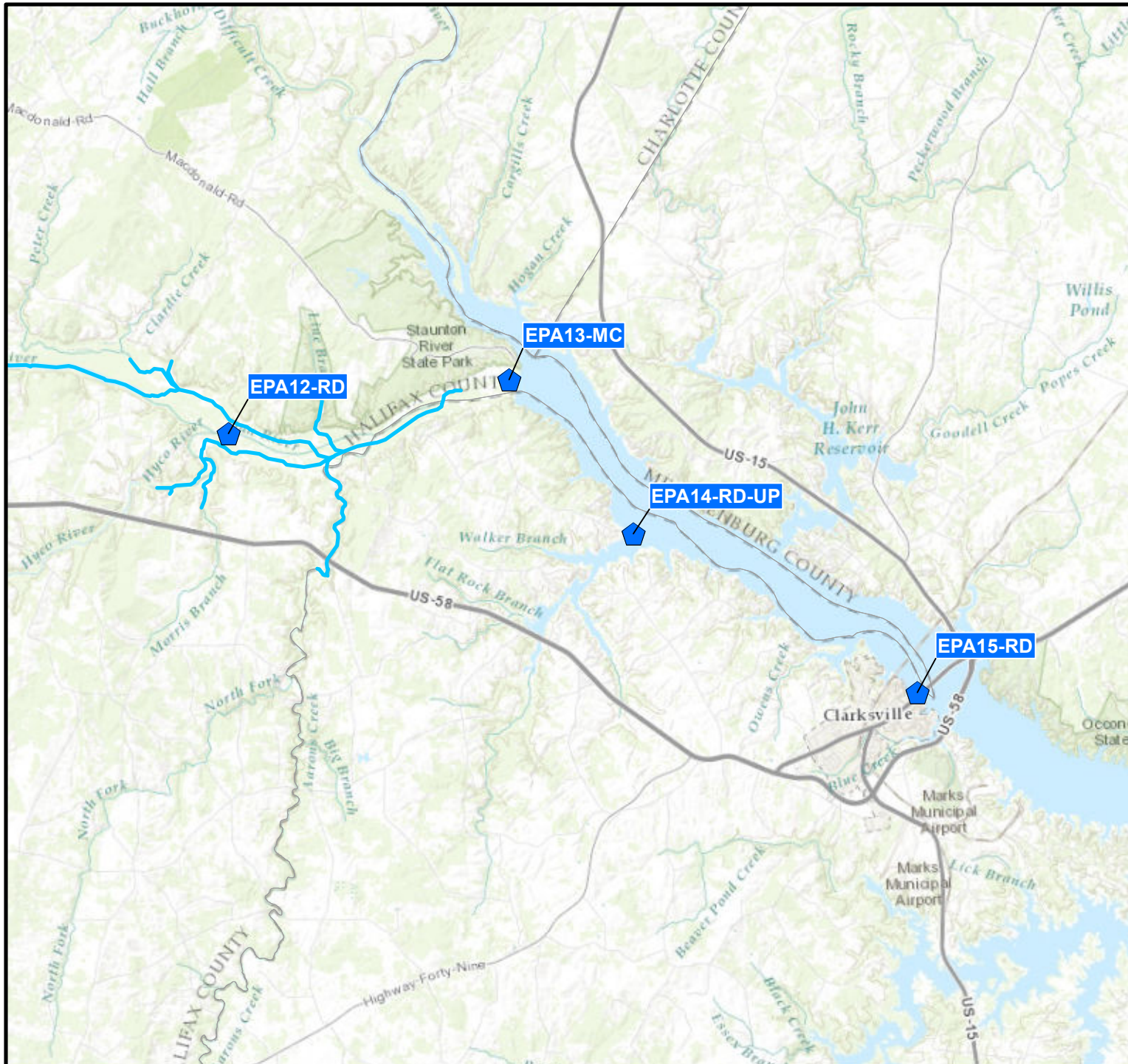
Analyte	Ecological Screening Standard for Surface Water Samples ¹		Transect EPA 15 Right Descending	
Sample Information				
Sample ID	-		EDEN-EPA15-R-SW-20140428	
Date	-		04/28/2014	
Time	-		0933	
Status	-		Validation Complete	
Type	-		Sediment-Water Interface	
Total Metals				
Aluminum	2,000	µg/L	110	µg/L
Antimony	5.6	µg/L	1U	µg/L
Arsenic	10	µg/L	1U	µg/L
Barium	220	µg/L	28	µg/L
Beryllium	0.66	µg/L	0.4U	µg/L
Boron	0.36	mg/L	0.061J	mg/L
Cadmium	2	µg/L	0.1U	µg/L
Calcium	-	-	9,300	µg/L
Chromium	29	µg/L	2U	µg/L
Cobalt	24	µg/L	0.21J	µg/L
Copper	3	µg/L	1	µg/L
Iron	2,300	µg/L	350	µg/L
Lead	0.6	µg/L	0.35	µg/L
Magnesium	-	-	3,600	µg/L
Manganese	200	µg/L	73	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L
Molybdenum	-	-	1U	µg/L
Nickel	17	µg/L	0.74J	µg/L
Potassium	53,000	µg/L	2,000	µg/L
Selenium	5	µg/L	2U	µg/L
Silver	0.06	µg/L	1U	µg/L
Sodium	680,000	µg/L	5,500	µg/L
Thallium	0.24	µg/L	0.2U	µg/L
Vanadium	27	µg/L	1.2	µg/L
Zinc	39	µg/L	20U	µg/L
Anions				
Bromide	-	-	57	ug/L
Chloride	230	mg/L	8.7	mg/L
Sulfate	-	-	6.8	mg/L

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Sample ID	-		EDEN-EPA15-R-SW-20140428	
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Time	-		0933	
Status	-		Validation Complete	
Type	-		Sediment-Water Interface	
Wet Chemistry				
Alkalinity, Total (As CaCO ₃)	-	-	32	mg/L
Hardness, Calcium/Magnesium (As CaCO ₃)	-	-	38	mg/L
Organic Carbon, Dissolved	-	-	2.6	mg/L
pH	6.5 - 9.0		std	7.56J

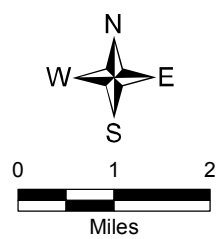
Notes

- 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
- J Value is estimated
- J+ Value is estimated with a possible high bias
- J- Value is estimated with a possible low bias
- µg/L micrograms per liter
- mg/L milligrams per liter
- std standard
- U Analyte was not detected at the listed reporting limit.



Legend

- ★ Approximate Spill Location
- ⬠ Sediment-Water Interface Sample Location
- Dan River



Map Source: ArcGIS Online World Map Topo, 2014

**Sediment-Water Interface
Sample Locations**
April 28, 2014

