

EDEN NORTH CAROLINA COAL ASH SPILL SEDIMENT RESULTS

NOTE: The data below represents sediment samples that were collected on April 28, 2014 by EPA START Team 1. Sediment sample measurements are in milligrams per kilogram (mg/Kg). The data is being compared to ecological risk screening levels (ERSLs) to protect aquatic life in the sediments 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 are all below the ERSLs with the exception of aluminum, barium, iron, and manganese. There were no exceedances of human health screening criteria for sediment. 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 Standards for Sediment ²		Transect EPA 12 Right Descending		Transect EPA 13 Mid-Channel		Transect EPA 14 Right Descending (upstream)	
Sample Information								
Sample ID	-		EDEN-EPA12-R-SD-20140428		EDEN-EPA13-C-SD-20140428		EDEN-EPA14-R-UP-SD-20140428	
Date	-		04/28/2014		04/28/2014		04/28/2014	
Time	-		0925		1130		1038	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment		Sediment		Sediment	
Total Metals								
Aluminum	3,200 (bkg)	mg/kg	3,200	mg/kg	16,000	mg/kg	4,800	mg/kg
Antimony	2 ^a	mg/kg	1.3UJ	mg/kg	1.7UJ	mg/kg	1.3UJ	mg/kg
Arsenic	9.8	mg/kg	2.8U	mg/kg	3.2J	mg/kg	1J	mg/kg
Barium	60 ^b	mg/kg	36J+	mg/kg	130J+	mg/kg	64J+	mg/kg
Beryllium	-	-	0.22J	mg/kg	0.92	mg/kg	0.22J	mg/kg
Boron	-	-	14U	mg/kg	17U	mg/kg	12U	mg/kg
Cadmium	0.99	mg/kg	0.067U	mg/kg	0.071J	mg/kg	0.063U	mg/kg
Calcium	-	-	550	mg/kg	1,300	mg/kg	730	mg/kg
Chromium	43.4	mg/kg	12	mg/kg	33	mg/kg	11	mg/kg
Cobalt	50	mg/kg	3.5	mg/kg	12	mg/kg	4	mg/kg
Copper	31.6	mg/kg	3.3J	mg/kg	20	mg/kg	8.8	mg/kg
Iron	6,800 (bkg)	mg/kg	6,200	mg/kg	25,000	mg/kg	9,400	mg/kg
Lead	35.8	mg/kg	3.2	mg/kg	14	mg/kg	2	mg/kg
Magnesium	-	-	1,100	mg/kg	3,300	mg/kg	2,800	mg/kg
Manganese	460 ^c	mg/kg	190	mg/kg	470	mg/kg	150	mg/kg
Mercury	0.18	mg/kg	0.024U	mg/kg	0.043	mg/kg	0.026U	mg/kg
Molybdenum	-	-	1.4U	mg/kg	0.84J	mg/kg	3	mg/kg
Nickel	22.7	mg/kg	3.9J	mg/kg	14	mg/kg	10	mg/kg
Potassium	-	-	750	mg/kg	2,200	mg/kg	2,300	mg/kg
Selenium	2 ^d	mg/kg	0.67U	mg/kg	0.66J	mg/kg	0.63U	mg/kg
Silver	0.733	mg/kg	0.13U	mg/kg	0.17U	mg/kg	0.13U	mg/kg
Sodium	-	-	280U	mg/kg	350U	mg/kg	230U	mg/kg
Thallium	-	mg/kg	0.076J	mg/kg	0.25	mg/kg	0.048J	mg/kg
Vanadium	57 ^c	mg/kg	13	mg/kg	50	mg/kg	26	mg/kg
Zinc	121	mg/kg	15	mg/kg	58	mg/kg	21	mg/kg

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Sample Information				
Sample ID	-	EDEN-EPA12-R-SD-20140428	EDEN-EPA13-C-SD-20140428	EDEN-EPA14-R-UP-SD-20140428
Date	-	04/28/2014	04/28/2014	04/28/2014
Time	-	0925	1130	1038
Status	-	Validation Complete	Validation Complete	Validation Complete
Type	-	Sediment	Sediment	Sediment
Physical Properties				
Percent Ash	-	1	%	ND
				%

Notes

² MacDonal, D.D.; Ingersoll, C.G.; Smorong, D.E.; Lindskoog, R.A.; Sloane, G; and T. Biernacki. 2003. Development and Evaluation of Numerical Sediment Quality Assessment Guidelines for Florida Inland Waters. Florida Department of Environmental Protection, Tallahassee, FL. Development and Evaluation of Numerical Sediment Quality Assessment Guidelines for Florida Inland Waters.

^a The screening value for antimony is from Long, Edward R., and Lee G. Morgan. 1991. The Potential for Biological Effects of Sediment-Sorbed Contaminants Tested in the National Status and Trends Program. NOAA Technical Memorandum NOS OMA 52.

^b The screening value for barium was the probable effect level (PEL) instead of the threshold effect level (TEL) because the TEL was below background

^c Sediment screening values for manganese and vanadium come from the NOAA SQuIRT.

<http://response.restoration.noaa.gov/sites/default/files/SQuiRTs.pdf>

^d The screening value for selenium is from Region 3 after Lemley, A.D. 2002. Selenium assessment in aquatic ecosystems. US Forest Service, Blacksburg, VA.

^e Cadmium from diet

^f Chromium (VI)

^g Methyl Mercury

^h Thallium Chloride

% Percent

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

mg/kg milligrams per kilogram

ND No fly ash detected at a PLM reporting limit of 1 percent

PLM Polarized light microscopy

U Analyte was not detected at the listed reporting limit.

UJ Analyte was not detected at the listed reporting limit, which is an estimated quantitation.

**EDEN NORTH CAROLINA COAL ASH SPILL
SEDIMENT RESULTS**

Analyte	Ecological Screening Standards for Sediment ²		Transect EPA 15 Right Descending	
Sample Information				
Sample ID	-		EDEN-EPA15-R-SD-20140428	
Date	-		04/28/2014	
Time	-		0933	
Status	-		Validation Complete	
Type	-		Sediment	
Total Metals				
Aluminum	3,200 (bkg)	mg/kg	10,000	mg/kg
Antimony	2 ^a	mg/kg	1.4UJ	mg/kg
Arsenic	9.8	mg/kg	1.1J	mg/kg
Barium	60 ^b	mg/kg	120J+	mg/kg
Beryllium	-	-	0.33J	mg/kg
Boron	-	-	12U	mg/kg
Cadmium	0.99	mg/kg	0.069U	mg/kg
Calcium	-	-	1,500	mg/kg
Chromium	43.4	mg/kg	18	mg/kg
Cobalt	50	mg/kg	7.1	mg/kg
Copper	31.6	mg/kg	16	mg/kg
Iron	6,800 (bkg)	mg/kg	17,000	mg/kg
Lead	35.8	mg/kg	4.2	mg/kg
Magnesium	-	-	4,400	mg/kg
Manganese	460 ^c	mg/kg	270	mg/kg
Mercury	0.18	mg/kg	0.024U	mg/kg
Molybdenum	-	-	2.7	mg/kg
Nickel	22.7	mg/kg	12	mg/kg
Potassium	-	-	4,000	mg/kg
Selenium	2 ^d	mg/kg	0.69U	mg/kg
Silver	0.733	mg/kg	0.14U	mg/kg
Sodium	-	-	130J	mg/kg
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Date	-	04/28/2014
Time	-	0933
Status	-	Validation Complete
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Physical Properties		
Percent Ash	-	-
		ND
		%

Notes

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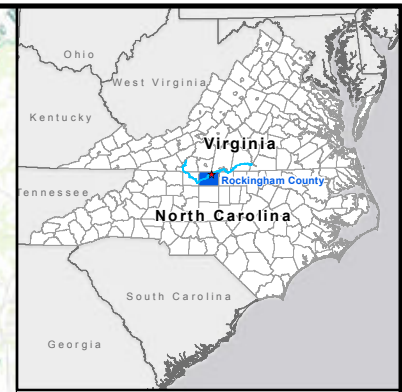
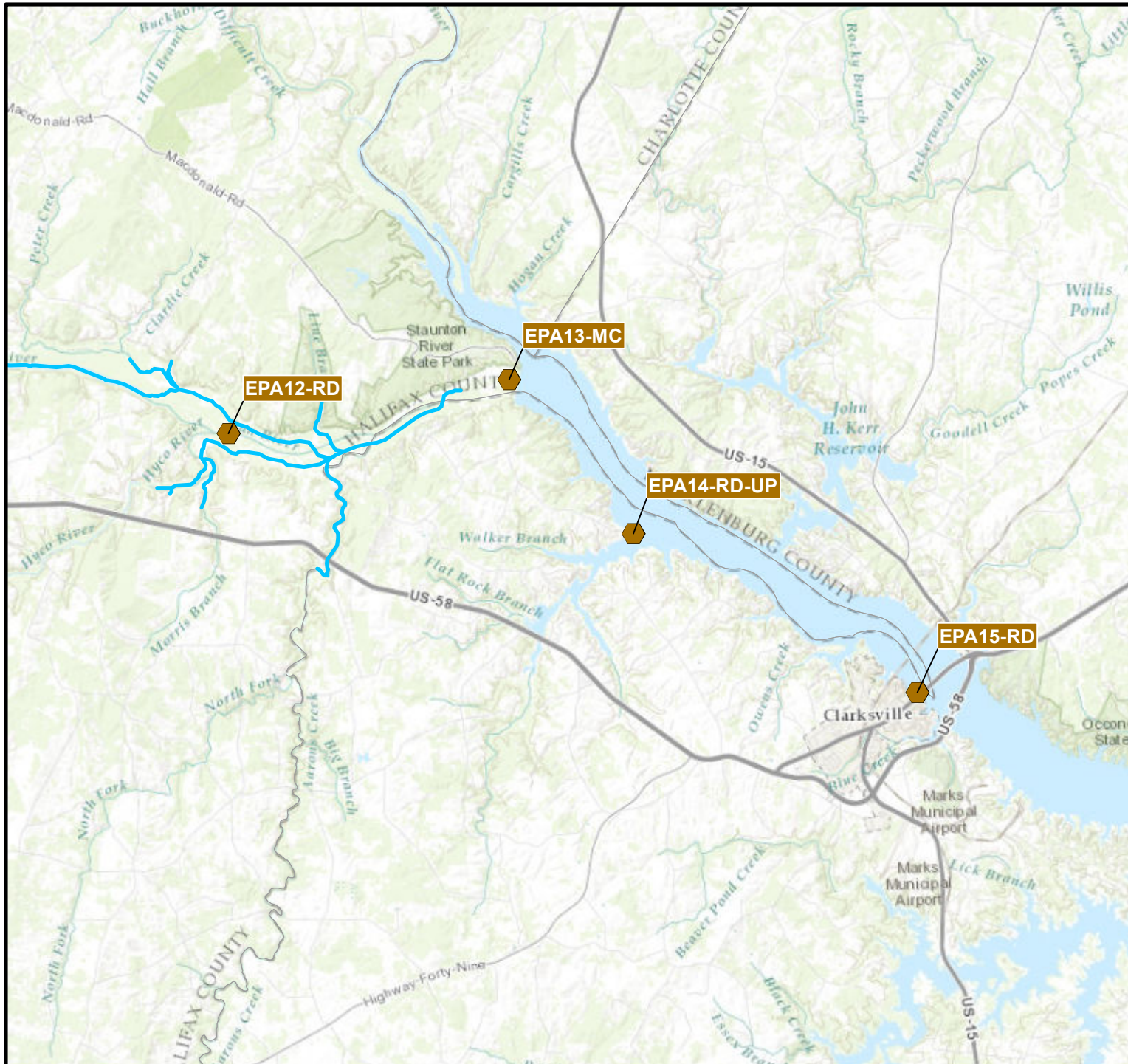
mg/kg milligrams per kilogram

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PLM Polarized light microscopy

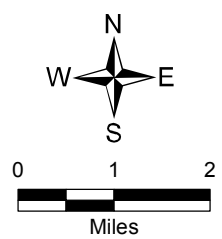
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Legend

-  Approximate Spill Location
-  Sediment Sample Location
-  Dan River



Map Source: ArcGIS Online World Map Topo, 2014

**Sediment
Sample Locations
April 28, 2014**

