

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

**NOTE:** The data below represents sediment-water interface samples that were collected on May 7, 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. 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 <sup>1</sup>		Transect DUKE 1A Left Descending		Transect DUKE 1H Right Descending		Transect FWS 2B Right Descending	
<b>Sample Information</b>								
Sample ID	-		EDEN-DUKE1A-L-BW-20140507		EDEN-DUKE1H-R-BW-20140507		EDEN-FWS2B-R-BW-20140507	
Date	-		05/07/2014		05/07/2014		05/07/2014	
Time	-		0954		1050		1152	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
<b>Dissolved metals</b>								
Aluminum	87	µg/L	13	µg/L	14	µg/L	14	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	1.1	µg/L	1.4	µg/L	0.95J	µg/L
Barium	220	µg/L	17	µg/L	20	µg/L	19	µg/L
Beryllium	0.66	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Boron	0.36	mg/L	0.087J	mg/L	0.15	mg/L	0.13	mg/L
Cadmium	0.1	µg/L	0.1U	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	6,500	µg/L	7,300	µg/L	7,000	µg/L
Chromium	25	µg/L	1.6J	µg/L	2.1	µg/L	1.1J	µg/L
Cobalt	3	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Copper	3	µg/L	0.55J	µg/L	0.5J	µg/L	1U	µg/L
Iron	1,000	µg/L	60	µg/L	58	µg/L	62	µg/L
Lead	0.59	µg/L	0.3U	µg/L	0.3U	µg/L	0.3U	µg/L
Magnesium	-	-	2,600	µg/L	2,800	µg/L	2,600	µg/L
Manganese	200	µg/L	2.5U	µg/L	2.5U	µg/L	2.5U	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	800	µg/L	0.49J	µg/L	1U	µg/L	1U	µg/L
Nickel	17	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Potassium	53,000	µg/L	1,400	µg/L	1,400	µg/L	1,400	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	4,300	µg/L	4,000	µg/L	3,900	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	1.1	µg/L	1.3	µg/L	0.95J	µg/L
Zinc	39	µg/L	20U	µg/L	20U	µg/L	20U	µg/L

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SEDIMENT-WATER INTERFACE RESULTS**

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<b>Sample Information</b>								
Sample ID	-		EDEN-DUKE1A-L-BW-20140507		EDEN-DUKE1H-R-BW-20140507		EDEN-FWS2B-R-BW-20140507	
Date	-		05/07/2014		05/07/2014		05/07/2014	
Time	-		0954		1050		1152	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
<b>Total Dissolved Solids</b>								
Total Dissolved Solids	-	-	62	mg/L	66	mg/L	76	mg/L
<b>Total Suspended Solids</b>								
Total Suspended Solids	-	-	14	mg/L	16	mg/L	11	mg/L
<b>Total Metals</b>								
Aluminum	2,000	µg/L	150	µg/L	130	µg/L	140	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	2.1	µg/L	1.7	µg/L	1.8	µg/L
Barium	220	µg/L	21	µg/L	23	µg/L	22	µg/L
Beryllium	0.66	µg/L	0.4U	µg/L	0.4U	µg/L	0.4U	µg/L
Boron	0.36	mg/L	0.09J	mg/L	0.15	mg/L	0.14	mg/L
Cadmium	2	µg/L	0.1U	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	6,700	µg/L	7,400	µg/L	7,400	µg/L
Chromium	29	µg/L	2.2	µg/L	1.9J	µg/L	2.1	µg/L
Cobalt	24	µg/L	0.27J	µg/L	0.25J	µg/L	0.2J	µg/L
Copper	3	µg/L	1	µg/L	0.88J	µg/L	0.79J	µg/L
Iron	2,300	µg/L	410	µg/L	370	µg/L	380	µg/L
Lead	0.6	µg/L	0.31	µg/L	0.3	µg/L	0.23J	µg/L
Magnesium	-	-	2,600	µg/L	2,700	µg/L	2,800	µg/L
Manganese	200	µg/L	42	µg/L	41	µg/L	27	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	-	-	1U	µg/L	1U	µg/L	1U	µg/L
Nickel	17	µg/L	0.42J	µg/L	0.41J	µg/L	0.41J	µg/L
Potassium	53,000	µg/L	1,400	µg/L	1,400	µg/L	1,400	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	4,200	µg/L	3,800	µg/L	4,000	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	6.8	µg/L	6	µg/L	6.7	µg/L
Zinc	39	µg/L	20U	µg/L	20U	µg/L	20U	µg/L

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<b>Sample Information</b>								
Sample ID	-		EDEN-DUKE1A-L-BW-20140507		EDEN-DUKE1H-R-BW-20140507		EDEN-FWS2B-R-BW-20140507	
Date	-		05/07/2014		05/07/2014		05/07/2014	
Time	-		0954		1050		1152	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface		Sediment-Water Interface	
<b>Anions</b>								
Bromide	-	-	50	µg/L	80	µg/L	74	µg/L
Chloride	230	mg/L	6.7	mg/L	8.8	mg/L	8.3	mg/L
Sulfate	-	-	4.8	mg/L	4.9	mg/L	4.8	mg/L
<b>Wet Chemistry</b>								
Alkalinity, Total (As CaCO <sub>3</sub> )	-	-	25	mg/L	24	mg/L	24	mg/L
Hardness, Calcium/Magnesium (As CaCO <sub>3</sub> )	-	-	28	mg/L	30	mg/L	30	mg/L
Organic Carbon, Dissolved	-	-	1.4	mg/L	1.5	mg/L	1.3	mg/L
pH	6.5 - 9.0		std	7.43J	std	7.4J	std	7.4J

Notes

<sup>1</sup> 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

°C degrees Celsius

EPA U.S. Environmental Protection Agency

J Value is estimated

µg/L micrograms per liter

mg/L milligrams per liter

mS/cm milliSiemens per centimeter

NTU Nephelometric turbidity units

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 <sup>1</sup>		Transect FWS 3A Left Descending		Transect EPA 01 Mid-Chanel	
<b>Sample Information</b>						
Sample ID	-		EDEN-FWS3A-L-BW-20140507		EDEN-EPA01-C-BW-20140507	
Date	-		05/07/2014		05/07/2014	
Time	-		1310		1410	
Status	-		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface	
<b>Dissolved metals</b>						
Aluminum	87	µg/L	13	µg/L	12	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	1.4	µg/L	1.1J	µg/L
Barium	220	µg/L	18	µg/L	19	µg/L
Beryllium	0.66	µg/L	0.4U	µg/L	0.4U	µg/L
Boron	0.36	mg/L	0.11	mg/L	0.12	mg/L
Cadmium	0.1	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	6,700	µg/L	6,900	µg/L
Chromium	25	µg/L	1.6J	µg/L	2U	µg/L
Cobalt	3	µg/L	0.4U	µg/L	0.4U	µg/L
Copper	3	µg/L	1U	µg/L	1U	µg/L
Iron	1,000	µg/L	54	µg/L	57	µg/L
Lead	0.59	µg/L	0.3U	µg/L	0.3U	µg/L
Magnesium	-	-	2,600	µg/L	2,600	µg/L
Manganese	200	µg/L	2.5U	µg/L	2.5U	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	800	µg/L	1U	µg/L	1U	µg/L
Nickel	17	µg/L	1U	µg/L	1U	µg/L
Potassium	53,000	µg/L	1,400	µg/L	1,400	µg/L
Selenium	5	µg/L	2U	µg/L	2U	µg/L
Silver	0.06	µg/L	1U	µg/L	1U	µg/L
Sodium	680,000	µg/L	4,300	µg/L	4,100	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	1.3	µg/L	0.85J	µg/L
Zinc	39	µg/L	20U	µg/L	20U	µg/L

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<b>Sample Information</b>						
Sample ID	-		EDEN-FWS3A-L-BW-20140507		EDEN-EPA01-C-BW-20140507	
Date	-		05/07/2014		05/07/2014	
Time	-		1310		1410	
Status	-		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface	
<b>Total Dissolved Solids</b>						
Total Dissolved Solids	-	-	62	mg/L	64	mg/L
<b>Total Suspended Solids</b>						
Total Suspended Solids	-	-	13	mg/L	21	mg/L
<b>Total Metals</b>						
Aluminum	2,000	µg/L	120	µg/L	110	µg/L
Antimony	5.6	µg/L	1U	µg/L	1U	µg/L
Arsenic	10	µg/L	2.1	µg/L	0.87J	µg/L
Barium	220	µg/L	21	µg/L	23	µg/L
Beryllium	0.66	µg/L	0.4U	µg/L	0.4U	µg/L
Boron	0.36	mg/L	0.12	mg/L	0.15	mg/L
Cadmium	2	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	7,000	µg/L	7,500	µg/L
Chromium	29	µg/L	2.2	µg/L	1.4J	µg/L
Cobalt	24	µg/L	0.21J	µg/L	0.29J	µg/L
Copper	3	µg/L	0.81J	µg/L	0.91J	µg/L
Iron	2,300	µg/L	360	µg/L	420	µg/L
Lead	0.6	µg/L	0.25J	µg/L	0.37	µg/L
Magnesium	-	-	2,600	µg/L	3,000	µg/L
Manganese	200	µg/L	29	µg/L	40	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	-	-	1U	µg/L	1U	µg/L
Nickel	17	µg/L	0.42J	µg/L	0.5J	µg/L
Potassium	53,000	µg/L	1,400	µg/L	1,600	µg/L
Selenium	5	µg/L	2U	µg/L	2U	µg/L
Silver	0.06	µg/L	1U	µg/L	1U	µg/L
Sodium	680,000	µg/L	4,200	µg/L	4,500	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	7.1	µg/L	1.6	µg/L
Zinc	39	µg/L	20U	µg/L	20U	µg/L

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Analyte	Ecological Screening Standard for Surface Water Samples <sup>1</sup>		Transect FWS 3A Left Descending		Transect EPA 01 Mid-Chanel	
<b>Sample Information</b>						
Sample ID	-		EDEN-FWS3A-L-BW-20140507		EDEN-EPA01-C-BW-20140507	
Date	-		05/07/2014		05/07/2014	
Time	-		1310		1410	
Status	-		Validation Complete		Validation Complete	
Type	-		Sediment-Water Interface		Sediment-Water Interface	
<b>Anions</b>						
Bromide	-	-	62	µg/L	68	µg/L
Chloride	230	mg/L	7.6	mg/L	7.9	mg/L
Sulfate	-	-	4.8	mg/L	4.8	mg/L
<b>Wet Chemistry</b>						
Alkalinity, Total (As CaCO <sub>3</sub> )	-	-	34	mg/L	27	mg/L
Hardness, Calcium/Magnesium (As CaCO <sub>3</sub> )	-	-	28	mg/L	31	mg/L
Organic Carbon, Dissolved	-	-	1.3	mg/L	1.4	mg/L
pH	6.5 - 9.0	std	7.43J	std	7.45J	std

Notes

<sup>1</sup> 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

°C degrees Celsius

EPA U.S. Environmental Protection Agency

J Value is estimated

µg/L micrograms per liter

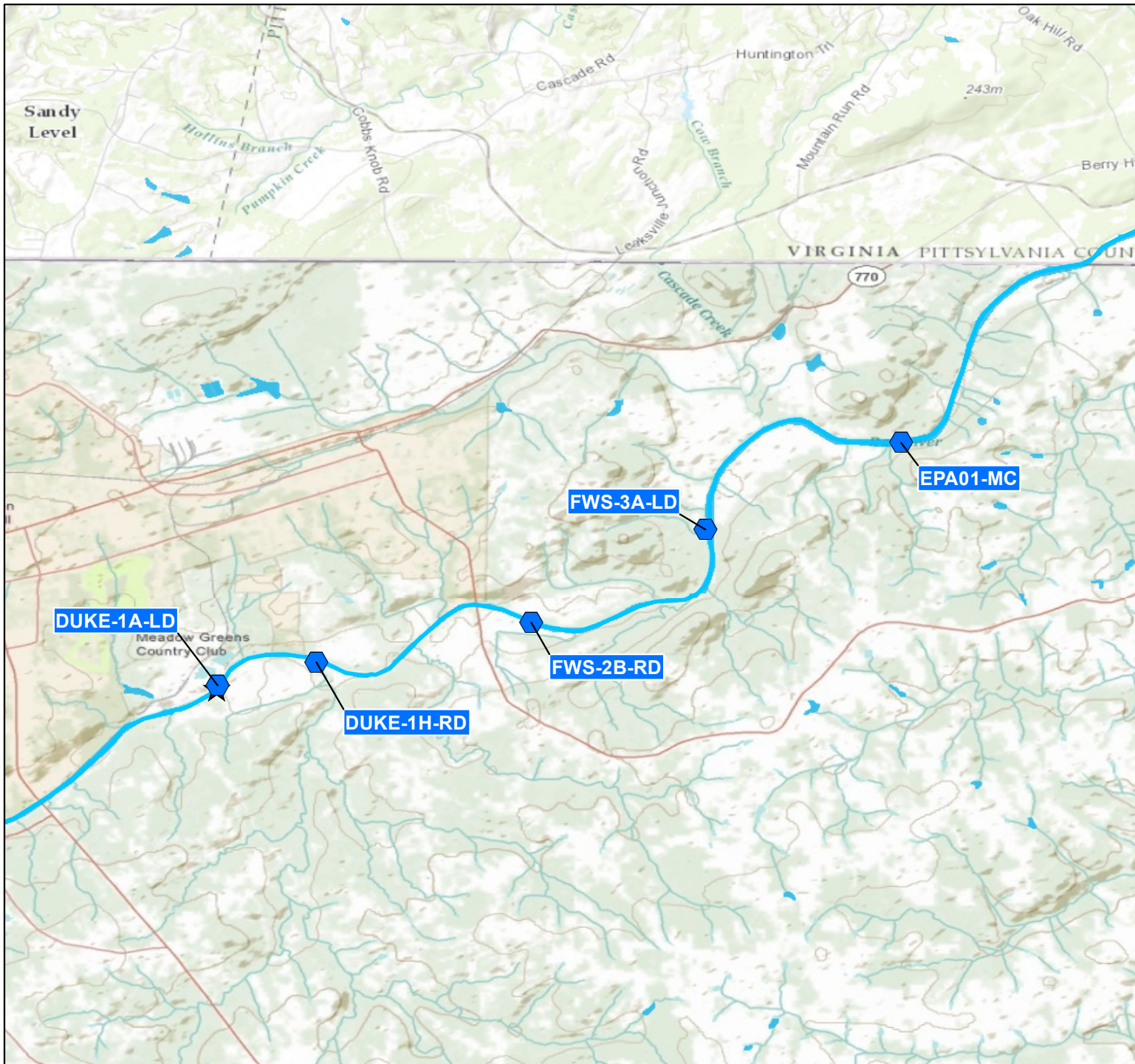
mg/L milligrams per liter

mS/cm milliSiemens per centimeter



NTU Nephelometric turbidity units

std standard

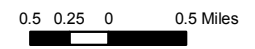
U Analyte was not detected at the listed reporting limit.



Legend

-  Approximate Spill Location
-  Sediment-Water Interface Sample Location

Imagery Source:  
ESRI, USGS Mapping Service, 2013



Eden Coal Ash Spill  
Eden, North Carolina

Sediment-Water Interface  
Sample Locations  
May 07, 2014

