

## EDEN NORTH CAROLINA COAL ASH SPILL SURFACE WATER RESULTS

NOTE: The data below represents surface water samples that were collected on March 27, 2014 by EPA START (Team 1). 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.

Analyte	Ecological Screening Standard for Surface Water Samples <sup>1</sup>		DRSS Boat Ramp		Hwy 700		Hwy 880	
<b>Sample Information</b>								
Sample ID	-		EDEN-DUKE-L-SW-20140327		EDEN-HW700-C-SW-20140327		EDEN-BHB-C-SW-20140327	
Date	-		03/27/2014		03/27/2014		03/27/2014	
Time	-		1250		1220		1155	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Surface Water		Surface Water		Surface Water	
<b>Dissolved metals</b>								
Aluminum	87	µg/L	10U	µg/L	10U	µg/L	3.09J	µg/L
Antimony	5.6	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Arsenic	10	µg/L	4.5U	µg/L	0.153J	µg/L	0.118J	µg/L
Barium	220	µg/L	17.3	µg/L	16.5	µg/L	15.8	µg/L
Beryllium	0.66	µg/L	0.65U	µg/L	0.65U	µg/L	0.65U	µg/L
Boron	0.36	mg/L	0.0711U	mg/L	0.0947U	mg/L	0.1U	mg/L
Cadmium	0.1	µg/L	0.1U	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	6,090	µg/L	6,160	µg/L	6,080	µg/L
Chromium	25	µg/L	0.124J	µg/L	0.116J	µg/L	0.114J	µg/L
Cobalt	3	µg/L	0.423J	µg/L	0.34J	µg/L	0.137J	µg/L
Copper	3	µg/L	2U	µg/L	2UJ	µg/L	2UJ	µg/L
Iron	1,000	µg/L	148	µg/L	174	µg/L	144	µg/L
Lead	0.59	µg/L	0.162J	µg/L	0.5U	µg/L	0.5U	µg/L
Magnesium	-	-	2,560J	µg/L	2,520J	µg/L	2,520J	µg/L
Manganese	200	µg/L	14.9	µg/L	10.2	µg/L	6.96	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	800	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Nickel	17	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Potassium	53,000	µg/L	5,000U	µg/L	5,000U	µg/L	5,000U	µg/L
Selenium	5	µg/L	4.5U	µg/L	4.5U	µg/L	4.5U	µg/L
Silver	0.06	µg/L	0.055U	µg/L	0.055U	µg/L	0.055U	µg/L
Sodium	680,000	µg/L	5,000U	µg/L	5,000U	µg/L	5,000U	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	0.248J	µg/L	0.252J	µg/L	0.247J	µg/L
Zinc	39	µg/L	10U	µg/L	3.36J-	µg/L	10UJ	µg/L

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SURFACE WATER RESULTS**

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Date	-		03/27/2014		03/27/2014		03/27/2014	
Time	-		1250		1220		1155	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Surface Water		Surface Water		Surface Water	
<b>Total Dissolved Solids</b>								
Total Dissolved Solids	-	-	21	mg/L	11	mg/L	7J	mg/L
<b>Total Suspended Solids</b>								
Total Suspended Solids	-	-	5.5	mg/L	2.5J	mg/L	7	mg/L
<b>Total Metals</b>								
Aluminum	2,000	µg/L	119	µg/L	119	µg/L	150	µg/L
Antimony	5.6	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Arsenic	10	µg/L	0.2J	µg/L	0.23J	µg/L	0.239J	µg/L
Barium	220	µg/L	16.2	µg/L	17.3	µg/L	17.3	µg/L
Beryllium	0.66	µg/L	0.65U	µg/L	0.65U	µg/L	0.65U	µg/L
Boron	0.36	mg/L	0.112U	mg/L	0.094U	mg/L	0.0964U	mg/L
Cadmium	2	µg/L	0.1U	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	6,130	µg/L	6,310	µg/L	6,550	µg/L
Chromium	29	µg/L	0.398J	µg/L	0.398J	µg/L	0.42J	µg/L
Cobalt	24	µg/L	0.161J	µg/L	0.142J	µg/L	0.155J	µg/L
Copper	3	µg/L	1.1J	µg/L	1.39J	µg/L	1.22J	µg/L
Iron	2,300	µg/L	510	µg/L	501	µg/L	614	µg/L
Lead	0.6	µg/L	0.348J	µg/L	0.221J	µg/L	0.218J	µg/L
Magnesium	-	-	2,560J	µg/L	2,570J	µg/L	2,700J	µg/L
Manganese	200	µg/L	17.5	µg/L	14.7	µg/L	16.6	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	-	-	5U	µg/L	5U	µg/L	5U	µg/L
Nickel	17	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Potassium	53,000	µg/L	5,000U	µg/L	5,000U	µg/L	5,000U	µg/L
Selenium	5	µg/L	4.5U	µg/L	4.5U	µg/L	4.5U	µg/L
Silver	0.06	µg/L	0.05U	µg/L	0.05U	µg/L	0.05U	µg/L
Sodium	680,000	µg/L	4,870J	µg/L	4,700J	µg/L	4,790J	µg/L
Thallium	0.24	µg/L	0.2UJ	µg/L	0.2UJ	µg/L	0.2UJ	µg/L
Vanadium	27	µg/L	0.865J	µg/L	0.904J	µg/L	0.927J	µg/L
Zinc	39	µg/L	10U	µg/L	14.3J+	µg/L	10U	µg/L
<b>Anions</b>								
Bromide	-	-	1U	mg/L	1U	mg/L	1U	mg/L
Chloride	230	mg/L	7.64	mg/L	7.67	mg/L	7.16	mg/L
Sulfate	-	-	3.92J-	mg/L	3.81J-	mg/L	4.04J-	mg/L

## EDEN NORTH CAROLINA COAL ASH SPILL SURFACE WATER RESULTS

Analyte	Ecological Screening Standard for Surface Water Samples <sup>1</sup>		DRSS Boat Ramp		Hwy 700		Hwy 880	
<b>Sample Information</b>								
Sample ID	-		EDEN-DUKE-L-SW-20140327		EDEN-HW700-C-SW-20140327		EDEN-BHB-C-SW-20140327	
Date	-		03/27/2014		03/27/2014		03/27/2014	
Time	-		1250		1220		1155	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Surface Water		Surface Water		Surface Water	
<b>Wet Chemistry</b>								
Alkalinity, Total (As CaCO <sub>3</sub> )	-	-	16.6	mg/L	16.9	mg/L	17	mg/L
Hardness, Calcium/Magnesium (As CaCO <sub>3</sub> )	-	-	25.8	mg/L	26.3	mg/L	27.5	mg/L
Organic Carbon, Dissolved	-	-	1.44	mg/L	1.96	mg/L	1.94	mg/L
pH	6.5 - 9.0		std	7.15J	std	7.15J	std	7.21J

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

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  
SURFACE WATER RESULTS**

Analyte	Ecological Screening Standard for Surface Water Samples <sup>1</sup>		Abreu-Grogan Park Boat Dock		Hwy 58 Bridge		Hwy 360 Bridge	
<b>Sample Information</b>								
Sample ID	-		EDEN-DANIN-R-SW-20140327		EDEN-HW58-C-SW-20140327		EDEN-HW360-C-SW-20140327	
Date	-		03/27/2014		03/27/2014		03/27/2014	
Time	-		1120		0930		1015	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Surface Water		Surface Water		Surface Water	
<b>Dissolved metals</b>								
Aluminum	87	µg/L	1.87J	µg/L	2.33J	µg/L	9.57J	µg/L
Antimony	5.6	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Arsenic	10	µg/L	0.143J	µg/L	0.138J	µg/L	0.112J	µg/L
Barium	220	µg/L	17	µg/L	18.7	µg/L	18.4	µg/L
Beryllium	0.66	µg/L	0.65U	µg/L	0.65U	µg/L	0.65U	µg/L
Boron	0.36	mg/L	0.096U	mg/L	0.0986U	mg/L	0.117U	mg/L
Cadmium	0.1	µg/L	0.1U	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	6,400	µg/L	6,630	µg/L	6,400	µg/L
Chromium	25	µg/L	0.108J	µg/L	0.128J	µg/L	0.175J	µg/L
Cobalt	3	µg/L	0.401J	µg/L	0.447J	µg/L	0.343J	µg/L
Copper	3	µg/L	2UJ	µg/L	2UJ	µg/L	2UJ	µg/L
Iron	1,000	µg/L	179	µg/L	227	µg/L	250	µg/L
Lead	0.59	µg/L	0.5U	µg/L	0.5U	µg/L	0.188J	µg/L
Magnesium	-	-	2,610J	µg/L	2,720J	µg/L	2,650J	µg/L
Manganese	200	µg/L	10.4	µg/L	9.72	µg/L	6.8	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	800	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Nickel	17	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Potassium	53,000	µg/L	5,000U	µg/L	5,000U	µg/L	5,000U	µg/L
Selenium	5	µg/L	4.5U	µg/L	4.5U	µg/L	4.5U	µg/L
Silver	0.06	µg/L	0.055U	µg/L	0.055U	µg/L	0.055U	µg/L
Sodium	680,000	µg/L	5,000U	µg/L	7,360	µg/L	6,600	µg/L
Thallium	0.24	µg/L	0.2U	µg/L	0.2U	µg/L	0.2U	µg/L
Vanadium	27	µg/L	0.269J	µg/L	0.347J	µg/L	0.392J	µg/L
Zinc	39	µg/L	10UJ	µg/L	2.57J-	µg/L	10UJ	µg/L

**EDEN NORTH CAROLINA COAL ASH SPILL  
SURFACE WATER RESULTS**

Analyte	Ecological Screening Standard for Surface Water Samples <sup>1</sup>		Abreu-Grogan Park Boat Dock		Hwy 58 Bridge		Hwy 360 Bridge	
<b>Sample Information</b>								
Sample ID	-		EDEN-DANIN-R-SW-20140327		EDEN-HW58-C-SW-20140327		EDEN-HW360-C-SW-20140327	
Date	-		03/27/2014		03/27/2014		03/27/2014	
Time	-		1120		0930		1015	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Surface Water		Surface Water		Surface Water	
<b>Total Dissolved Solids</b>								
Total Dissolved Solids	-	-	6J	mg/L	27	mg/L	43	mg/L
<b>Total Suspended Solids</b>								
Total Suspended Solids	-	-	5.5	mg/L	8	mg/L	11	mg/L
<b>Total Metals</b>								
Aluminum	2,000	µg/L	141	µg/L	265	µg/L	361	µg/L
Antimony	5.6	µg/L	5U	µg/L	5U	µg/L	5U	µg/L
Arsenic	10	µg/L	0.253J	µg/L	0.318J	µg/L	0.283J	µg/L
Barium	220	µg/L	18.6	µg/L	22.1	µg/L	21.5	µg/L
Beryllium	0.66	µg/L	0.65U	µg/L	0.65U	µg/L	0.65U	µg/L
Boron	0.36	mg/L	0.093U	mg/L	0.0837	mg/L	0.0866U	mg/L
Cadmium	2	µg/L	0.1U	µg/L	0.1U	µg/L	0.1U	µg/L
Calcium	-	-	6,400	µg/L	6,650	µg/L	6,610	µg/L
Chromium	29	µg/L	0.421J	µg/L	0.651J	µg/L	0.704J	µg/L
Cobalt	24	µg/L	0.154J	µg/L	0.244J	µg/L	0.282J	µg/L
Copper	3	µg/L	0.986J	µg/L	1.4J	µg/L	1.39J	µg/L
Iron	2,300	µg/L	598	µg/L	864	µg/L	1,020	µg/L
Lead	0.6	µg/L	0.246J	µg/L	0.353J	µg/L	0.465J	µg/L
Magnesium	-	-	2,590J	µg/L	2,730J	µg/L	2,720J	µg/L
Manganese	200	µg/L	15.9	µg/L	23.1	µg/L	25.7	µg/L
Mercury	0.000012	mg/L	0.0002U	mg/L	0.0002U	mg/L	0.0002U	mg/L
Molybdenum	-	-	5U	µg/L	0.307J	µg/L	5U	µg/L
Nickel	17	µg/L	5U	µg/L	1.32J	µg/L	5U	µg/L
Potassium	53,000	µg/L	5,000U	µg/L	5,000U	µg/L	5,000U	µg/L
Selenium	5	µg/L	4.5U	µg/L	4.5U	µg/L	4.5U	µg/L
Silver	0.06	µg/L	0.05U	µg/L	0.05U	µg/L	0.05U	µg/L
Sodium	680,000	µg/L	4,450J	µg/L	7,520	µg/L	7,010	µg/L
Thallium	0.24	µg/L	0.2UJ	µg/L	0.2U	µg/L	0.2UJ	µg/L
Vanadium	27	µg/L	1.03J	µg/L	1.57J	µg/L	1.67J	µg/L
Zinc	39	µg/L	10U	µg/L	10U	µg/L	10U	µg/L
<b>Anions</b>								
Bromide	-	-	1U	mg/L	1U	mg/L	1U	mg/L
Chloride	230	mg/L	7.25	mg/L	11.3	mg/L	9.81	mg/L
Sulfate	-	-	4.27J-	mg/L	4.72J-	mg/L	4.5J-	mg/L

## EDEN NORTH CAROLINA COAL ASH SPILL SURFACE WATER RESULTS

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Time	-		1120		0930		1015	
Status	-		Validation Complete		Validation Complete		Validation Complete	
Type	-		Surface Water		Surface Water		Surface Water	
<b>Wet Chemistry</b>								
Alkalinity, Total (As CaCO <sub>3</sub> )	-	-	18.1	mg/L	18.8	mg/L	18.4	mg/L
Hardness, Calcium/Magnesium (As CaCO <sub>3</sub> )	-	-	26.6	mg/L	27.8	mg/L	27.7	mg/L
Organic Carbon, Dissolved	-	-	1.64	mg/L	2.09	mg/L	2.55	mg/L
pH	6.5 - 9.0		std	7.14J	std	7.19J	std	7.13J

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

EPA U.S. Environmental Protection Agency

J Value is estimated

J+ Value is estimated with a possible high bias

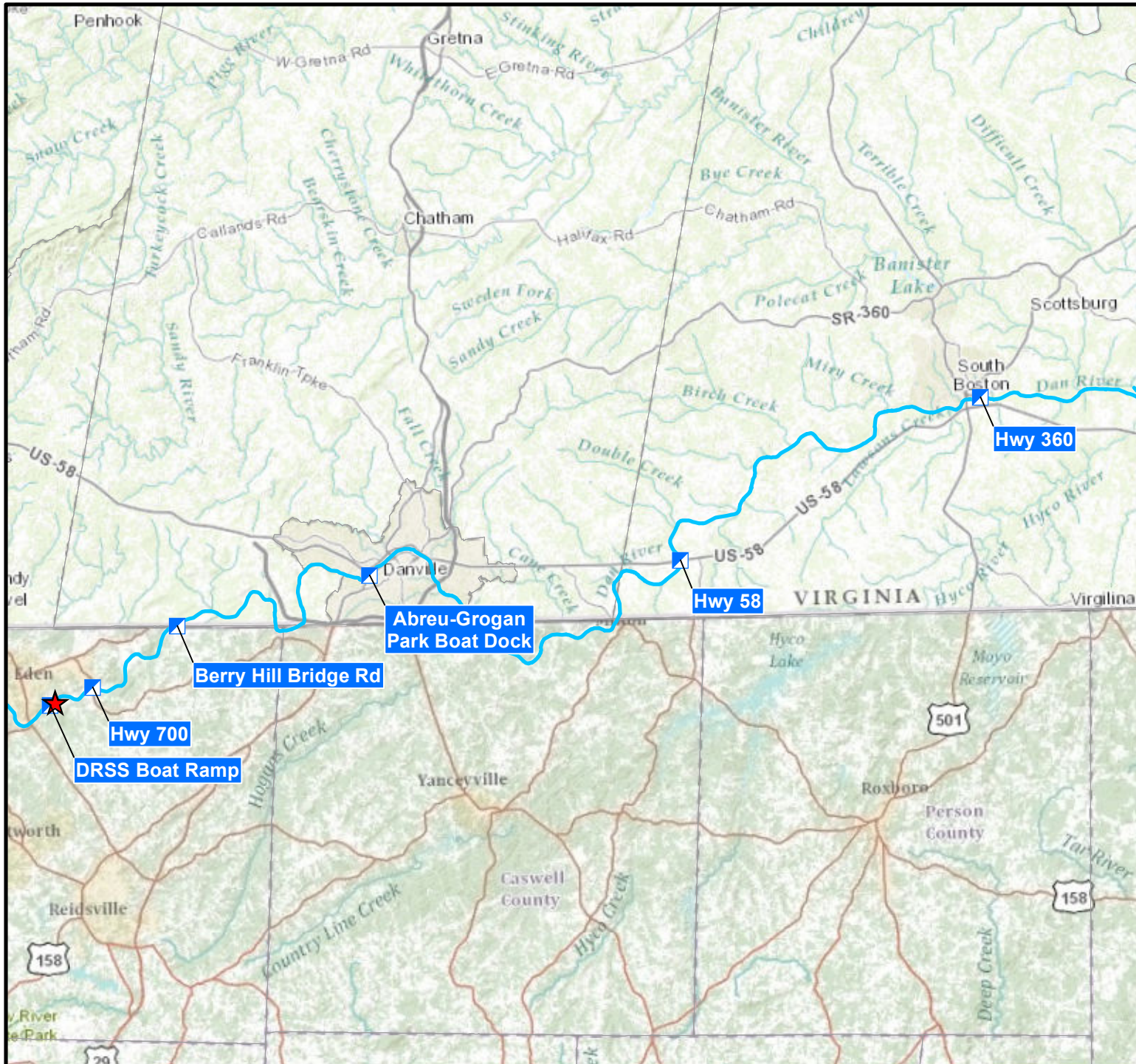
J- Value is estimated with a possible low bias

µg/L micrograms per liter

mg/L milligrams per liter

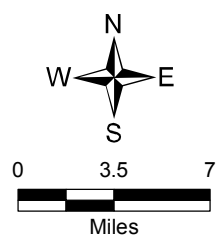
std standard

U Analyte was not detected at the listed reporting limit.



**Legend**

- ★ Approximate Spill Location
- Surface Water Sample Location
- Dan River



Map Source: ArcGIS Online World Map Topo, 2014

**Surface Water  
Sample Locations  
March 27, 2014**

