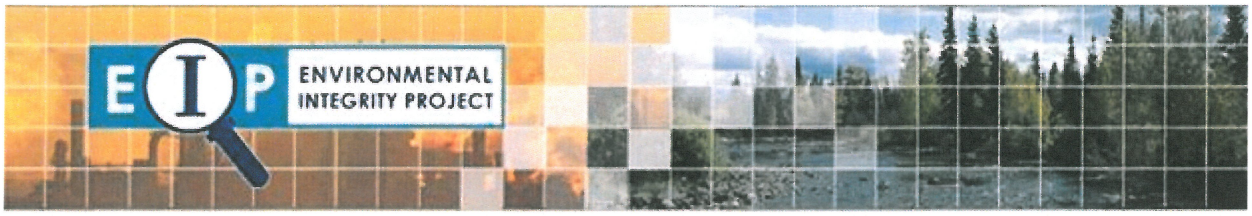

New EPA Data Shows High Levels of Boron and Selenium in Scrubber Wastewater
June 20, 2012

New data collected by the Environmental Protection Agency (EPA) show levels of pollution in wastewater discharged from "scrubbers" at seven power plants across the country that threaten the health of our rivers, streams, lakes, and wetlands. The seven plants, two in Pennsylvania, and one each in Tennessee, North Carolina, Maryland, Ohio, and Wisconsin, reported levels of selenium and boron in post-treatment wastewater that were consistently higher than federal and state water quality criteria. In some cases, levels of these pollutants are an order of magnitude higher than federal or state standards that protect aquatic life. The results reported below are based on two rounds of sampling – one by plant operators and one by EPA – and were obtained from the EPA through the Freedom of Information Act (FOIA).

The data indicates that current treatment technologies at these plants are not effective in reducing high concentrations of boron and selenium in scrubber wastewater. Other contaminants were also detected at some plants, but data limitations make it impossible to compare those results to water quality criteria.

Selenium is a bioaccumulative pollutant that EPA has determined is harmful to fish and other aquatic life at levels as low as five micrograms per liter (µg/l).[1] Selenium can impede the growth and survival of juvenile fish, and offspring of adult fish that were exposed to excessive selenium suffer skeletal deformities.[2] The *average* of samples collected by industry and by the EPA show that selenium in scrubber effluent is between 21 and 546 times higher than EPA's water quality criteria at some plants:

Site Name (State)	Sampling Average (µg/l)	EPA Chronic Water Quality Criteria (µg/l)
Pleasant Prairie (WI)	2,730	5
Hatfield's Ferry (PA)	705	
Miami Fort (OH)	594	
Keystone (PA)	318	
Dickerson (MD)	108	

Boron is highly toxic to plants and algae, inhibiting growth, protein content, chlorophyll content and photosynthesis, and chronic exposure to even low levels of boron can impair development in fish.[3] There are no federal water quality criteria for boron, but some states have adopted them. For example, Pennsylvania's water quality criterion for boron is 1,600 µg/l (chronic) and 8,100 µg/l (acute).[4] Even short term exposure to concentrations above the acute standard can jeopardize aquatic life. Yet the

average of the EPA and industry samples found boron concentrations in scrubber effluent ranged from 21 to 405 times Pennsylvania's *acute* water quality criteria.

Site Name (State)	Sampling Average (µg/l)	PADEP Chronic Water Quality Criteria (µg/l)	PADEP Acute Water Quality Criteria (µg/l)
Miami Fort (OH)	405,000	1,600	8,100
Keystone (PA)	293,000		
Hatfield's Ferry (PA)	186,000		
Dickerson (MD)	179,000		
Belews Creek (NC)	170,000		

The data obtained from EPA was collected by the Agency to support its efforts to establish discharge limits for toxins and other pollutants found in wastewater from scrubber sludge.[5] In a FOIA request, the Environmental Integrity Project (EIP) requested all data related to the EPA's sampling of power plant wastewater collected since September 1, 2009. EPA provided sampling data collected by EPA and plant owners for scrubber effluent at eight coal-fired power plants. The data from one of these plants could not be analyzed due to confidential business information (CBI) claims by the plant. In the attached chart, sampling events identified as "EPA" refer to samples collected by EPA. Sampling events identified as "Plant" refer to samples that EPA required the plants to collect and send to EPA contracted laboratories for analysis. The water quality criteria for boron and selenium refer to the chronic criteria established by EPA (selenium) and Pennsylvania (boron).

The samples identified in the attached chart were collected at locations downstream of wastewater treatment. The scrubber effluent at these plants may be mixed with other wastestreams in a larger "canal" that may result in some dilution of the *concentration* of these pollutants prior to discharge to surface waters. However, the actual *loadings (i.e. mass)* of selenium and boron are not diminished by mixing with other wastestreams. Selenium and boron are bioaccumulative, which means they accumulate in the environment and tissues of aquatic life over time and are not necessarily less harmful if concentrations of these pollutants are diluted.

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[1] U.S. Envtl. Prot. Agency, National Recommended Water Quality Criteria, http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#L (last visited June 19, 2012).

[2] *See, e.g.*, Christopher L. Rowe et al., Ecotoxicological Implications of Aquatic Disposal of Coal Combustion Residues in the United States: A Review (Mar. 14, 2002), available at http://ecophys.fishwild.vt.edu/publications/rowe%20et%20al.%202002%20coal%20waste.pdf.

[3] World Health Organization International Programme on Chemical Safety: Environmental Health Criteria (EHC) for Boron, *available at* http://www.inchem.org/documents/ehc/ehc/ehc204.htm#PartNumber:9.

[4] 25 Pa. Code § 93.8c, tbl. 5.

[5] *See* http://water.epa.gov/scitech/wastetech/guide/steam_index.cfm for additional information on EPA's efforts to revise the effluent limitation guidelines for power plants.

Attachment A

Site Name	Receiving Water Body	Sampling Event	Pollutant Name	Sampling Average Concentration (µg/L)	Water Quality Limit (µg/L)
Allen (Shelby County, TN)	McKellar Lake (Mississippi River)	EPA	Boron	63,800	1,600
Allen (Shelby County, TN)	McKellar Lake (Mississippi River)	Plant	Boron	87,500	1,600
Belews Creek (Stokes County, NC)	West Belews Creek	EPA	Boron	170,000	1,600
Belews Creek (Stokes County, NC)	West Belews Creek	Plant	Boron	168,000	1,600
Belews Creek (Stokes County, NC)	West Belews Creek	EPA	Selenium	15.7	5
Belews Creek (Stokes County, NC)	West Belews Creek	Plant	Selenium	10.3	5
Dickerson (Montgomery County, MD)	Potomac River	EPA	Boron	179,000	1,600
Dickerson (Montgomery County, MD)	Potomac River	Plant	Boron	133,000	1,600
Dickerson (Montgomery County, MD)	Potomac River	EPA	Selenium	108	5
Dickerson (Montgomery County, MD)	Potomac River	Plant	Selenium	90.3	5
Hatfield's Ferry (Greene County, PA)	Monongahela River	EPA	Boron	186,000	1,600
Hatfield's Ferry (Greene County, PA)	Monongahela River	Plant	Boron	175,000	1,600
Hatfield's Ferry (Greene County, PA)	Monongahela River	EPA	Selenium	581	5
Hatfield's Ferry (Greene County, PA)	Monongahela River	Plant	Selenium	705	5
Keystone (Armstrong County, PA)	Allegheny River	EPA	Boron	293,000	1,600
Keystone (Armstrong County, PA)	Allegheny River	Plant	Boron	268,000	1,600
Keystone (Armstrong County, PA)	Allegheny River	EPA	Selenium	318	5
Keystone (Armstrong County, PA)	Allegheny River	Plant	Selenium	94.5	5
Miami Fort (Hamilton County, OH)	Ohio River	EPA	Boron	318,000	1,600
Miami Fort (Hamilton County, OH)	Ohio River	Plant	Boron	405,000	1,600
Miami Fort (Hamilton County, OH)	Ohio River	EPA	Selenium	594	5
Miami Fort (Hamilton County, OH)	Ohio River	Plant	Selenium	535	5
Pleasant Prairie (Kenosha County, WI)	Lake Michigan	EPA	Boron	9,830	1,600
Pleasant Prairie (Kenosha County, WI)	Lake Michigan	Plant	Boron	13,800	1,600
Pleasant Prairie (Kenosha County, WI)	Lake Michigan	EPA	Selenium	2,060	5
Pleasant Prairie (Kenosha County, WI)	Lake Michigan	Plant	Selenium	2,730	5