



IOWA DEPARTMENT OF NATURAL RESOURCES

Beneficial Use Determination:
Solid By-Product Management Plan

Analytical Testing Report



DNR Certified Lab: 397

Lab Report Date: 10/08/2025

By-Product Generator: University of Iowa Power Plant

City: Iowa City State: IA Zip: 52242

By-Product Name: Combined Boiler Ash

Send completed report form(s), laboratory analytics, and supplemental Solid By-Product Management Plan (SBMP) documentation to:

Iowa Department of Natural Resources
Land Quality Bureau
Solid Waste Section
502 E 9th St
Des Moines, IA 50319-0034

For questions concerning this report form please contact the DNR at (515) 725-8351.

ANALYTICAL TESTING RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846).

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)			Total Metals	
*	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result
☒	Antimony	0.006 mg/L	0.06 mg/L	0.030 mg/L	31 mg/kg	33 mg/kg
☒	Arsenic	0.010 mg/L	0.10 mg/L	<0.01 mg/L	17 mg/kg	6.4 mg/kg
☒	Barium	2.0 mg/L	20.0 mg/L	23 mg/L	15,000 mg/kg	2200 mg/kg
☒	Beryllium	0.004 mg/L	0.04 mg/L	<0.004 mg/L	110 mg/kg	<2.0 mg/kg
☒	Boron				16,000 mg/kg	160 mg/kg
☒	Cadmium	0.005 mg/L	0.05 mg/L	<0.005 mg/L	70 mg/kg	<2.0 mg/kg
☒	Chromium	0.1 mg/L	1.0 mg/L	<0.1 mg/L	** (Total)	26 mg/kg
					(Hexavalent - VI) 210 mg/kg	mg/kg
					(Trivalent - III) 97,000 mg/kg	mg/kg
☒	Cobalt				31 mg/kg	<5.0 mg/kg
☒	Copper	1.3 mg/L	13.0 mg/L	<1.0 mg/L	15,000 mg/kg	180 mg/kg
☒	Fluoride	4.0 mg/L	40.0 mg/L	0.53 mg/L	4,700 mg/kg	5.5 mg/kg
☒	Lead	0.015 mg/L	0.15 mg/L	<0.015 mg/L	400 mg/kg	18 mg/kg
☒	Lithium				160 mg/kg	18 mg/kg
☒	Manganese				10,000 mg/kg	92 mg/kg
☒	Mercury	0.002 mg/L	0.02 mg/L	<0.002 mg/L	23 mg/kg	<1.0 mg/kg
☒	Molybdenum				390 mg/kg	8.9 mg/kg
☒	Nickel				1,500 mg/kg	14 mg/kg
☒	Selenium	0.05 mg/L	0.5 mg/L	<0.05 mg/L	390 mg/kg	<1.0 mg/kg
☒	Silver				370 mg/kg	<1.0 mg/kg
☒	Thallium	0.002 mg/L	0.02 mg/L	<0.002 mg/L	0.78 mg/kg	<0.5 mg/kg
☒	Vanadium				350 mg/kg	14 mg/kg
☒	Zinc				23,000 mg/kg	470 mg/kg

*Required contaminant

**If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) - [Regulatory Limits](#)

Metals				Volatile Organic Compounds			
*	Contaminant	Regulatory Limit	Test Result	*	Contaminant	Regulatory Limit	Test Result
☒	Arsenic	5.0 mg/L	<0.5 mg/L	☐	Benzene	0.5 mg/L	mg/L
☒	Barium	100.0 mg/L	27 mg/L	☐	Carbon tetrachloride	0.5 mg/L	mg/L
☒	Cadmium	1.0 mg/L	<0.1 mg/L	☐	Chlorobenzene	100.0 mg/L	mg/L
☒	Chromium	5.0 mg/L	<0.5 mg/L	☐	Chloroform	6.0 mg/L	mg/L
☒	Lead	5.0 mg/L	<0.5 mg/L	☐	1,2-Dichloroethane	0.5 mg/L	mg/L
☒	Mercury	0.2 mg/L	<0.02 mg/L	☐	1,1-Dichloroethylene	0.7 mg/L	mg/L
☒	Selenium	1.0 mg/L	<0.1 mg/L	☐	Methyl ethyl ketone	200.0 mg/L	mg/L
☒	Silver	5.0 mg/L	<0.5 mg/L	☐	Tetrachloroethylene	0.7 mg/L	mg/L
				☐	Trichloroethylene	0.5 mg/L	mg/L
				☐	Vinyl chloride	0.2 mg/L	mg/L
Pesticides				Semi-Volatile Organic Compounds			
*	Contaminant	Regulatory Limit	Test Result	*	Contaminant	Regulatory Limit	Test Result
☐	Chlordane	0.03 mg/L	mg/L	☐	o-Cresol	200.0 mg/L	mg/L
☐	Endrin	0.02 mg/L	mg/L	☐	m-Cresol	200.0 mg/L	mg/L
☐	Heptachlor (and its epoxide)	0.008 mg/L	mg/L	☐	p-Cresol	200.0 mg/L	mg/L
☐	Lindane	0.4 mg/L	mg/L	☐	Cresol	200.0 mg/L	mg/L
☐	Methoxychlor	10.0 mg/L	mg/L	☐	1,4-Dichlorobenzene	7.5 mg/L	mg/L
☐	Toxaphene	0.5 mg/L	mg/L	☐	2,4-Dinitrotoluene	0.13 mg/L	mg/L
				☐	Hexachlorobenzene	0.13 mg/L	mg/L
				☐	Hexachlorobutadiene	0.5 mg/L	mg/L
				☐	Hexachloroethane	3.0 mg/L	mg/L
				☐	Nitrobenzene	2.0 mg/L	mg/L
Herbicides				☐	Pentachlorophenol	100.0 mg/L	mg/L
*	Contaminant	Regulatory Limit	Test Result	☐	Pyridine	5.0 mg/L	mg/L
☐	2,4-D	10.0 mg/L	mg/L	☐	2,4,5-Trichlorophenol	400.0 mg/L	mg/L
☐	2,4,5-TP (Silvex)	1.0 mg/L	mg/L	☐	2,4,6-Trichlorophenol	2.0 mg/L	mg/L
				☐			

*Required contaminant

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature: Mark Maxwell Date: 10/8/2025
 Printed Name: Mark Maxwell Title: Environmental Engineer



VIA ELECTRONIC MAIL

Chad Stobbe
Iowa Department of Natural Resources
Chad.Stobbe@dnr.iowa.gov

October 9, 2025

RE: Notification of Antimony Total Metals and Barium SPLP Exceedances in Boiler Ash Sample, University of Iowa Power Plant

Dear Mr. Stobbe:

As required in Special Condition 6) a. of Beneficial Use Determination 07-BUD-20-02, UI is required to submit a written notification within 10 business days for any results that exceed regulatory limits.

A composite sample of the power plant's combined boiler ash was submitted to State Hygienic Laboratory, on September 5, 2025. The test results were received from the lab on October 8, 2025. The results from the testing showed antimony exceeded the total metals regulatory limit of 31 mg/kg. The tested antimony value was 33 mg/kg. The total metals results were entered into the IDNR Cumulative Risk Calculator and the resultant values were found to be below 1.0 for the Site Worker scenario. Additionally, the test results showed that barium exceeded the SPLP (10 X MCL) limit of 20 mg/L for the composite sample. The tested barium value was 23 mg/L.

In response to the elevated SPLP barium result we have halted shipments of ash to the BMC Aggregates beneficial use site, and we will be collecting another ash sample this week for shipment to a different certified laboratory.

We will be in contact with you as we receive more information regarding the high barium result and we will not resume disposal of ash at the BMC facility until we receive your approval.

Please contact me at 319-631-1950, or mark.maxwell@engie.com with any questions regarding this report.

Sincerely,

Mark Maxwell

Mark Maxwell
Environmental Advisor

Enclosures:
2025-10-09 – IOWA – HLI Ash Sample Report.pdf
DNR BUD Form October 2025

CC: BMC Aggregates, L.C., Sherman Lundy, sherml@bmcaggregates.com
ENGIE, Melissa Gilmartin, melissa.gilmartin@engie.com
University of Iowa, Jenna Wischmeyer, jenna-wischmeyer@uiowa.edu

Collection Location ash unloader		Collector and Phone maxwell mark 319/631-1950	Client Reference ui-641874	Accession # 2713939	CORRECTED REPORT 1
IOWA CITY,		Collected 2025-08-14	Received 2025-09-05 10:54	Project	
Report To	ENGIE GENERATION NORTH AMERICA LLC 208 W BURLINGTON ST IOWA CITY, IA 52242				Sample Description ash
					Sample Type Solid
					Sample Source
					Sample Note(s) 1

RESULTS OF ANALYSIS - FINAL REPORT

TEST	RESULT (mg/kg [dry wt])	QUANT LIMIT	MCL	ANALYSIS NOTE(S)
Fluoride, EPA 300.0				2, 3
Fluoride	5.5	5	4.0	
TEST	RESULT (mg/L)	QUANT LIMIT	MCL	ANALYSIS NOTE(S)
Fluoride, EPA 300.0				2, 3
Fluoride	0.53	0.05	4.0	
TEST	RESULT (mg/L)	QUANT LIMIT		ANALYSIS NOTE(S)
Mercury, EPA 7470A (SPLP)				
Mercury	<0.002	0.002		
TEST	RESULT (mg/L)	QUANT LIMIT	REGULATORY LEVEL	ANALYSIS NOTE(S)
Mercury, EPA 7470A (TCLP)				
Mercury	<0.02	0.02	0.2	
TEST	RESULT (mg/kg [dry wt])	QUANT LIMIT		ANALYSIS NOTE(S)
Mercury, EPA 7471B				
Mercury	<1.0	1		
Metals, EPA 6020B				
Antimony	33	5		
Arsenic	6.4	1		
Barium	2200	5		
Beryllium	<2.0	2		
Cadmium	<2.0	2		
Chromium	26	2		
Cobalt	<5.0	5		
Copper	180	5		
Lead	18	10		
Manganese	92	2		
Molybdenum	8.9	5		
Nickel	14	5		
Selenium	<1.0	1		
Silver	<1.0	1		
Thallium	<0.5	0.5		
Vanadium	14	5		
Zinc	470	2		
Metals, EPA 6010 D				
Boron	160	5		



Collection Location	Collector	Client Reference	Accession #	CORRECTED REPORT 1
ash unloader	maxwell mark	ui-641874	2713939	

TEST	RESULT (mg/kg [dry wt])	QUANT LIMIT	ANALYSIS NOTE(S)
Lithium	18	1	

TEST	RESULT (mg/L)	QUANT LIMIT	REGULATORY LEVEL	ANALYSIS NOTE(S)
Metals, EPA 6020B (TCLP)				
Arsenic	<0.5	0.5	5	
Barium	27	10	100	
Cadmium	<0.1	0.1	1	
Chromium	<0.5	0.5	5	
Lead	<0.5	0.5	5	
Selenium	<0.1	0.1	1	
Silver	<0.5	0.5	5	

TEST	RESULT	ANALYSIS NOTE(S)
Synthetic Precipitation Leaching Procedure, EPA 1312		
Leachate pH	12	

TEST	RESULT (mg/L)	QUANT LIMIT	ANALYSIS NOTE(S)
Metals, EPA 6020B (SPLP)			
Antimony	0.030	0.006	
Arsenic	<0.01	0.01	
Barium	23	2	
Beryllium	<0.004	0.004	
Cadmium	<0.005	0.005	
Chromium	<0.1	0.1	
Copper	<1.0	1	
Lead	<0.015	0.015	
Manganese	<0.05	0.05	
Molybdenum	<0.05	0.05	
Nickel	<0.1	0.1	
Selenium	<0.05	0.05	
Silver	<0.1	0.1	
Thallium	<0.002	0.002	
Vanadium	<0.05	0.05	
Zinc	<0.1	0.1	
Cobalt	<0.05	0.05	

TEST	RESULT	ANALYSIS NOTE(S)
Leaching for TCLP, EPA 1311		
Leachate pH	12	

SAMPLE AND ANALYSIS NOTES

1. Unless otherwise noted, the sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions. Unreleased sample and switched Org from U of I Power Plant to Engie
2. Sample matrix effects were observed in the analysis of this sample.
3. The MCL (maximum contaminant level) is only applicable to compliance monitoring samples under the Safe Drinking Water Act (SDWA).



Collection Location	Collector	Client Reference	Accession #	CORRECTED REPORT 1
ash unloader	maxwell mark	ui-641874	2713939	

ANALYSIS INFORMATION

TEST	ANALYZED	SITE	RELEASED	ANALYSIS PREP
1. Fluoride, EPA 300.0	2025-09-13 16:47 MGB	3201	2025-09-16 09:16 JAE	
2. Fluoride, EPA 300.0	2025-10-07 03:17 MGB	3201	2025-10-07 10:30 JAE	
3. Mercury, EPA 7470A (SPLP)	2025-10-03 10:39 SGB	3201	2025-10-03 15:42 DLS	
4. Mercury, EPA 7470A (TCLP)	2025-10-03 10:39 SGB	3201	2025-10-03 15:42 DLS	
5. Mercury, EPA 7471B	2025-09-18 12:49 SGB	3201	2025-09-19 15:14 BRW	
6. Metals, EPA 6020B	2025-09-12 10:56 SGB	3201	2025-09-17 14:37 BRW	
7. Metals, EPA 6010 D	2025-09-18 13:30 MRC	3201	2025-09-25 14:44 BRW	
8. Metals, EPA 6020B (TCLP)	2025-10-01 10:21 SGB	3201	2025-10-03 15:02 DLS	
9. Synthetic Precipitation Leaching Procedure, EPA 1312	2025-09-24 13:45 KMJ	3201	2025-09-26 08:24 JAE	
10. Metals, EPA 6020B (SPLP)	2025-10-01 10:21 SGB	3201	2025-10-03 15:02 DLS	
11. Leaching for TCLP, EPA 1311	2025-09-24 13:45 KMJ	3201	2025-09-26 08:24 JAE	

DESCRIPTION OF UNITS

mg/kg [dry wt] = Milligrams per Kilogram by Dry Weight

mg/L = Milligrams per Liter

SITE(S) PERFORMING TESTING

3201 STATE HYGIENIC LAB AT THE UNIV. OF IOWA, IOWA LABORATORIES COMPLEX, 2220 S ANKENY BLVD, ANKENY, IA 50023; Phone 515/725-1600; Fax 515/725-1642; Dustin M. May, Ph.D., Associate Director; Michael A. Pentella, Ph.D., D(ABMM), Director; IOWA ENVIRONMENTAL LAB ID #397; CLIA ID Number 16D0709302

The result(s) of this report relate only to the items analyzed. Where the laboratory has not been responsible for the sampling stage the results apply only to the sample as received. This report shall not be reproduced except in full without the written approval of the laboratory. If you have any questions, please call Client Services at 800/421-IOWA (4692) or 319/335-4500.