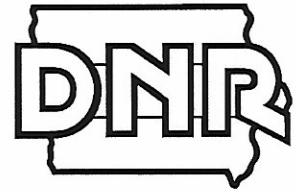




# Beneficial Use Determination: Analytical Testing Report



<p>DNR Certified Lab: <u>Eurofins TestAmerica, Cedar Falls</u></p> <p>Lab Report Date: <u>4/10/2022</u></p> <p>By-Product Generator: <u>Keokuk Steel Castings</u></p> <p>City: <u>Keokuk</u>, State: <u>IA</u>, Zip: <u>52632</u></p> <p>By-Product Name: <u>Foundry Sand</u></p>	<p>Send completed report form(s) and associated laboratory analytics to:</p> <p>Iowa Department of Natural Resources Land Quality Bureau Solid Waste Section 502 East 9<sup>th</sup> Street Des Moines, IA 50319-0034</p> <p>For questions concerning this report form, please contact the DNR at (515) 725-8351.</p>
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## ANALYTICAL 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
<input type="checkbox"/>	Antimony	0.006 mg/L	0.06 mg/L	<0.0200 mg/L	31 mg/kg	<0.374 mg/kg
<input type="checkbox"/>	Arsenic	0.010 mg/L	0.10 mg/L	<0.0168 mg/L	17 mg/kg	4.17 mg/kg
<input type="checkbox"/>	Barium	2.0 mg/L	20.0 mg/L	<0.0600 mg/L	15,000 mg/kg	63.6 mg/kg
<input type="checkbox"/>	Beryllium	0.004 mg/L	0.04 mg/L	<0.00680 mg/L	110 mg/kg	0.255 mg/kg
<input type="checkbox"/>	Boron				16,000 mg/kg	<21.7 mg/kg
<input type="checkbox"/>	Cadmium	0.005 mg/L	0.05 mg/L	<0.00200 mg/L	70 mg/kg	0.168 mg/kg
<input type="checkbox"/>	Chromium	0.1 mg/L	1.0 mg/L	<0.0340 mg/L	** (Total)	12.7 mg/kg
(Hexavalent - VI)					mg/kg	
(Trivalent - III)					mg/kg	
<input type="checkbox"/>	Cobalt				23 mg/kg	4.70 mg/kg
<input type="checkbox"/>	Copper	1.3 mg/L	13.0 mg/L	<0.0360 mg/L	15,000 mg/kg	8.67 mg/kg
<input type="checkbox"/>	Fluoride	4.0 mg/L	40.0 mg/L	0.314 mg/L	4,700 mg/kg	<6.99 mg/kg
<input type="checkbox"/>	Lead	0.015 mg/L	0.15 mg/L	<0.00640 mg/L	400 mg/kg	88.9 mg/kg
<input type="checkbox"/>	Lithium				160 mg/kg	4.02 mg/kg
<input type="checkbox"/>	Manganese				10,000 mg/kg	440 mg/kg
<input type="checkbox"/>	Mercury	0.002 mg/L	0.02 mg/L	<0.00150 mg/L	23 mg/kg	<0.00633 mg/kg
<input type="checkbox"/>	Molybdenum				390 mg/kg	<0.426 mg/kg
<input type="checkbox"/>	Nickel				1,500 mg/kg	9.54 mg/kg
<input type="checkbox"/>	Selenium	0.05 mg/L	0.5 mg/L	<0.0332 mg/L	390 mg/kg	<0.557 mg/kg
<input type="checkbox"/>	Silver				370 mg/kg	<0.252 mg/kg
<input type="checkbox"/>	Thallium	0.002 mg/L	0.02 mg/L	<0.00520 mg/L	0.78 mg/kg	<0.200 mg/kg
<input type="checkbox"/>	Vanadium				350 mg/kg	18.7 mg/kg
<input type="checkbox"/>	Zinc				23,000 mg/kg	41.5 mg/kg

(\*) Required contaminant

(\*\*) If Total Chromium  $\geq$  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
<input type="checkbox"/>	Arsenic	5.0 mg/L	<0.0300 mg/L	<input type="checkbox"/>	Benzene	0.5 mg/L	mg/L
<input type="checkbox"/>	Barium	100.0 mg/L	0.0833 mg/L	<input type="checkbox"/>	Carbon tetrachloride	0.5 mg/L	mg/L
<input type="checkbox"/>	Cadmium	1.0 mg/L	<0.0039 mg/L	<input type="checkbox"/>	Chlorobenzene	100.0 mg/L	mg/L
<input type="checkbox"/>	Chromium	5.0 mg/L	0.0392 mg/L	<input type="checkbox"/>	Chloroform	6.0 mg/L	mg/L
<input type="checkbox"/>	Lead	5.0 mg/L	<0.0260 mg/L	<input type="checkbox"/>	1,2-Dichloroethane	0.5 mg/L	mg/L
<input type="checkbox"/>	Mercury	0.2 mg/L	<0.0015 mg/L	<input type="checkbox"/>	1,1-Dichloroethylene	0.7 mg/L	mg/L
<input type="checkbox"/>	Selenium	1.0 mg/L	<0.0290 mg/L	<input type="checkbox"/>	Methyl ethyl ketone	200.0 mg/L	mg/L
<input type="checkbox"/>	Silver	5.0 mg/L	<0.0140 mg/L	<input type="checkbox"/>	Tetrachloroethylene	0.7 mg/L	mg/L
				<input type="checkbox"/>	Trichloroethylene	0.5 mg/L	mg/L
				<input type="checkbox"/>	Vinyl chloride	0.2 mg/L	mg/L
Pesticides				Semi-Volatile Organic Compounds			
*	Contaminant	Regulatory Limit	Test Result	*	Contaminant	Regulatory Limit	Test Result
<input type="checkbox"/>	Chlordane	0.03 mg/L	mg/L	<input type="checkbox"/>	o-Cresol	200.0 mg/L	mg/L
<input type="checkbox"/>	Endrin	0.02 mg/L	mg/L	<input type="checkbox"/>	m-Cresol	200.0 mg/L	mg/L
<input type="checkbox"/>	Heptachlor (& its epoxide)	0.008 mg/L	mg/L	<input type="checkbox"/>	p-Cresol	200.0 mg/L	mg/L
<input type="checkbox"/>	Lindane	0.4 mg/L	mg/L	<input type="checkbox"/>	Cresol	200.0 mg/L	mg/L
<input type="checkbox"/>	Methoxychlor	10.0 mg/L	mg/L	<input type="checkbox"/>	1,4-Dichlorobenzene	7.5 mg/L	mg/L
<input type="checkbox"/>	Toxaphene	0.5 mg/L	mg/L	<input type="checkbox"/>	2,4-Dinitrotoluene	0.13 mg/L	mg/L
				<input type="checkbox"/>	Hexachlorobenzene	0.13 mg/L	mg/L
				<input type="checkbox"/>	Hexachlorobutadiene	0.5 mg/L	mg/L
				<input type="checkbox"/>	Hexachloroethane	3.0 mg/L	mg/L
				<input type="checkbox"/>	Nitrobenzene	2.0 mg/L	mg/L
Herbicides				<input type="checkbox"/>	Pentachlorophenol	100.0 mg/L	mg/L
*	Contaminant	Regulatory Limit	Test Result	<input type="checkbox"/>	Pyridine	5.0 mg/L	mg/L
<input type="checkbox"/>	2,4-D	10.0 mg/L	mg/L	<input type="checkbox"/>	2,4,5-Trichlorophenol	400.0 mg/L	mg/L
<input type="checkbox"/>	2,4,5-TP (Silvex)	1.0 mg/L	mg/L	<input type="checkbox"/>	2,4,6-Trichlorophenol	2.0 mg/L	mg/L

(\* Required contaminant)

By-Product pH	
<input type="checkbox"/>	

**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:   
 Printed Name: Shawn Ferdiq

Date: 4/15/24  
 Title: Quality Manager

# ANALYTICAL REPORT

## PREPARED FOR

Attn: Shawn Ferdig  
Keokuk Steel Castings  
3972 Main Street  
Keokuk, Iowa 52632

Generated 4/10/2024 1:33:06 PM

## JOB DESCRIPTION

Beneficial ReUse Metals

## JOB NUMBER

310-277859-1

# Eurofins Cedar Falls

## Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

## Authorization



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Authorized for release by  
Bob Michels, Project Manager I  
[Bob.Michels@et.eurofinsus.com](mailto:Bob.Michels@et.eurofinsus.com)  
(319)277-2401



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# Case Narrative

Client: Keokuk Steel Castings  
Project: Beneficial ReUse Metals

Job ID: 310-277859-1

**Job ID: 310-277859-1**

**Eurofins Cedar Falls**

## Job Narrative 310-277859-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

### Receipt

The sample was received on 4/1/2024 9:35 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice.

### HPLC/IC

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

### Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

### General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Eurofins Cedar Falls

# Sample Summary

Client: Keokuk Steel Castings  
Project/Site: Beneficial ReUse Metals

Job ID: 310-277859-1

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<u>Lab Sample ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Collected</u>	<u>Received</u>
310-277859-1	North	Solid	03/28/24 13:55	04/01/24 09:35

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11

# Client Sample Results

Client: Keokuk Steel Castings  
Project/Site: Beneficial ReUse Metals

Job ID: 310-277859-1

**Client Sample ID: North**

**Lab Sample ID: 310-277859-1**

Date Collected: 03/28/24 13:55

Matrix: Solid

Date Received: 04/01/24 09:35

**Method: SW846 9056A - Anions, Ion Chromatography - SPLP**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.314		0.200	0.0750	mg/L			04/03/24 14:46	1

**Method: SW846 6010D - Metals (ICP) - TCLP**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.0300		0.100	0.0300	mg/L		04/03/24 13:27	04/04/24 17:54	1
Barium	0.0833	J	0.200	0.0400	mg/L		04/03/24 13:27	04/04/24 17:54	1
Cadmium	<0.00390		0.0200	0.00390	mg/L		04/03/24 13:27	04/04/24 17:54	1
Chromium	0.0392		0.0200	0.00600	mg/L		04/03/24 13:27	04/04/24 17:54	1
Lead	<0.0260		0.100	0.0260	mg/L		04/03/24 13:27	04/04/24 17:54	1
Selenium	<0.0290		0.100	0.0290	mg/L		04/03/24 13:27	04/04/24 17:54	1
Silver	<0.0140		0.0500	0.0140	mg/L		04/03/24 13:27	04/04/24 17:54	1

**Method: SW846 6020B - Metals (ICP/MS) - SPLP West**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0200		0.0400	0.0200	mg/L		04/04/24 09:45	04/08/24 18:59	4
Arsenic	<0.0168		0.0400	0.0168	mg/L		04/04/24 09:45	04/08/24 18:59	4
Barium	<0.0600		0.200	0.0600	mg/L		04/04/24 09:45	04/08/24 18:59	4
Beryllium	<0.00680		0.0200	0.00680	mg/L		04/04/24 09:45	04/08/24 18:59	4
Cadmium	<0.00200		0.0100	0.00200	mg/L		04/04/24 09:45	04/08/24 18:59	4
Chromium	<0.0340		0.100	0.0340	mg/L		04/04/24 09:45	04/08/24 18:59	4
Copper	<0.0360		0.100	0.0360	mg/L		04/04/24 09:45	04/08/24 18:59	4
Lead	<0.00640		0.0200	0.00640	mg/L		04/04/24 09:45	04/08/24 18:59	4
Selenium	<0.0332		0.100	0.0332	mg/L		04/04/24 09:45	04/09/24 17:28	4
Thallium	<0.00520		0.0200	0.00520	mg/L		04/04/24 09:45	04/08/24 18:59	4

**Method: SW846 7470A - Mercury (CVAA) - TCLP**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00150		0.00200	0.00150	mg/L		04/08/24 13:34	04/09/24 14:55	1

**Method: SW846 7470A - Mercury (CVAA) - SPLP West**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00150		0.00200	0.00150	mg/L		04/08/24 13:42	04/09/24 15:35	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (EPA Moisture)	0.9		0.1	0.1	%			04/02/24 06:23	1
Percent Solids (EPA Moisture)	99.1		0.1	0.1	%			04/02/24 06:23	1

**General Chemistry - Soluble**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 9045D)	8.3	HF	1.0	1.0	SU			04/03/24 15:36	1

**Client Sample ID: North**

**Lab Sample ID: 310-277859-1**

Date Collected: 03/28/24 13:55

Matrix: Solid

Date Received: 04/01/24 09:35

Percent Solids: 99.1

**Method: SW846 9056A - Anions, Ion Chromatography - Soluble**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<6.99		18.6	6.99	mg/Kg	☆		04/01/24 18:44	10

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# Client Sample Results

Client: Keokuk Steel Castings  
 Project/Site: Beneficial ReUse Metals

Job ID: 310-277859-1

**Client Sample ID: North**

**Lab Sample ID: 310-277859-1**

Date Collected: 03/28/24 13:55

Matrix: Solid

Date Received: 04/01/24 09:35

Percent Solids: 99.1

**Method: SW846 6020B - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.374		0.870	0.374	mg/Kg	✳	04/01/24 09:00	04/05/24 18:13	5
<b>Arsenic</b>	<b>4.17</b>		0.870	0.365	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
<b>Barium</b>	<b>63.6</b>		0.870	0.435	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
<b>Beryllium</b>	<b>0.255</b>	<b>J</b>	0.435	0.174	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
Boron	<21.7		43.5	21.7	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
<b>Cadmium</b>	<b>0.168</b>	<b>J</b>	0.435	0.165	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
<b>Chromium</b>	<b>12.7</b>		1.30	0.565	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
<b>Cobalt</b>	<b>4.70</b>		0.435	0.157	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
<b>Copper</b>	<b>8.67</b>		1.30	0.530	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
<b>Lead</b>	<b>88.9</b>		2.17	0.678	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
<b>Lithium</b>	<b>4.02</b>		2.17	0.591	mg/Kg	✳	04/01/24 09:00	04/05/24 18:13	5
<b>Manganese</b>	<b>440</b>		2.17	1.13	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
Molybdenum	<0.426		0.870	0.426	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
<b>Nickel</b>	<b>9.54</b>		1.30	0.591	mg/Kg	✳	04/01/24 09:00	04/05/24 18:13	5
Selenium	<0.557		1.30	0.557	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
Silver	<0.252		0.435	0.252	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
Thallium	<0.200		0.435	0.200	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
<b>Vanadium</b>	<b>18.7</b>		1.30	0.322	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5
<b>Zinc</b>	<b>41.5</b>		4.35	2.26	mg/Kg	✳	04/01/24 09:00	04/04/24 18:12	5

**Method: SW846 7471B - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00633		0.0154	0.00633	mg/Kg	✳	04/03/24 13:48	04/05/24 12:53	1

# Lab Chronicle

Client: Keokuk Steel Castings  
 Project/Site: Beneficial ReUse Metals

Job ID: 310-277859-1

**Client Sample ID: North**

**Lab Sample ID: 310-277859-1**

**Date Collected: 03/28/24 13:55**

**Matrix: Solid**

**Date Received: 04/01/24 09:35**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
SPLP	Leach	1312			417609	D0DG	EET CF	04/02/24 15:30 - 04/03/24 08:00 <sup>1</sup>
SPLP	Analysis	9056A		1	417892	QTZ5	EET CF	04/03/24 14:46
TCLP	Leach	1311			417604	D0DG	EET CF	04/02/24 15:30 - 04/03/24 08:00 <sup>1</sup>
TCLP	Prep	3010A			417753	QTZ5	EET CF	04/03/24 13:27
TCLP	Analysis	6010D		1	417967	ZRI4	EET CF	04/04/24 17:54
SPLP West	Leach	1312			417613	D0DG	EET CF	04/02/24 15:30 - 04/03/24 08:00 <sup>1</sup>
SPLP West	Prep	3010A			417754	QTZ5	EET CF	04/04/24 09:45
SPLP West	Analysis	6020B		4	418203	NFT2	EET CF	04/08/24 18:59
SPLP West	Leach	1312			417613	D0DG	EET CF	04/02/24 15:30 - 04/03/24 08:00 <sup>1</sup>
SPLP West	Prep	3010A			417754	QTZ5	EET CF	04/04/24 09:45
SPLP West	Analysis	6020B		4	418312	NFT2	EET CF	04/09/24 17:28
SPLP West	Leach	1312			417613	D0DG	EET CF	04/02/24 15:30 - 04/03/24 08:00 <sup>1</sup>
SPLP West	Prep	7470A			418139	DHM5	EET CF	04/08/24 13:42
SPLP West	Analysis	7470A		1	418276	A6US	EET CF	04/09/24 15:35
TCLP	Leach	1311			417604	D0DG	EET CF	04/02/24 15:30 - 04/03/24 08:00 <sup>1</sup>
TCLP	Prep	7470A			418134	DHM5	EET CF	04/08/24 13:34
TCLP	Analysis	7470A		1	418276	A6US	EET CF	04/09/24 14:55
Soluble	Leach	DI Leach			417715	WZC8	EET CF	04/03/24 09:40
Soluble	Analysis	9045D		1	417764	WZC8	EET CF	04/03/24 15:36
Total/NA	Analysis	Moisture		1	417526	DGU1	EET CF	04/02/24 06:23

**Client Sample ID: North**

**Lab Sample ID: 310-277859-1**

**Date Collected: 03/28/24 13:55**

**Matrix: Solid**

**Date Received: 04/01/24 09:35**

**Percent Solids: 99.1**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Soluble	Leach	DI Leach			417260	DHM5	EET CF	04/01/24 13:05
Soluble	Analysis	9056A		10	417557	QTZ5	EET CF	04/01/24 18:44
Total/NA	Prep	3050B			417515	DHM5	EET CF	04/01/24 09:00
Total/NA	Analysis	6020B		5	417969	DHM5	EET CF	04/04/24 18:12
Total/NA	Prep	3050B			417515	DHM5	EET CF	04/01/24 09:00
Total/NA	Analysis	6020B		5	418086	NFT2	EET CF	04/05/24 18:13
Total/NA	Prep	7471B			417757	DHM5	EET CF	04/03/24 13:48
Total/NA	Analysis	7471B		1	418007	A6US	EET CF	04/05/24 12:53

<sup>1</sup> This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

**Laboratory References:**

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

# Definitions/Glossary

Client: Keokuk Steel Castings  
Project/Site: Beneficial ReUse Metals

Job ID: 310-277859-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### General Chemistry

Qualifier	Qualifier Description
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

# Accreditation/Certification Summary

Client: Keokuk Steel Castings  
Project/Site: Beneficial ReUse Metals

Job ID: 310-277859-1

## Laboratory: Eurofins Cedar Falls

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6020B	3050B	Solid	Lithium
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

# Method Summary

Client: Keokuk Steel Castings  
Project/Site: Beneficial ReUse Metals

Job ID: 310-277859-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6010D	Metals (ICP)	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
7471B	Mercury (CVAA)	SW846	EET CF
9045D	pH	SW846	EET CF
Moisture	Percent Moisture	EPA	EET CF
1311	TCLP Extraction	SW846	EET CF
1312	SPLP Extraction	SW846	EET CF
3010A	Preparation, Total Metals	SW846	EET CF
3050B	Preparation, Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF
7471B	Preparation, Mercury	SW846	EET CF
DI Leach	Deionized Water Leaching Procedure	ASTM	EET CF

#### Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401



Environment Testing America



310-277859 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>Keduk Steel</u>			
City/State:	CITY	STATE	Project:
		<u>IA</u>	
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>04/11/24</u>	<u>0935</u>	<u>[Signature]</u>
Delivery Type: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____
Multiple Coolers?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # _____ of _____
Cooler Custody Seals Present?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
<b>Temperature Record</b>			
Coolant: <input type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input checked="" type="checkbox"/> NONE			
Thermometer ID: <u>T</u>		Correction Factor (°C): <u>to 0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):		Corrected Temp (°C):	
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
	<u>Clear 32 oz</u>	<u>soil jar 4oz</u>	
Uncorrected Temp (°C):	<u>15.3</u>	<u>15.1</u>	
Corrected Temp (°C):	<u>15.3</u>	<u>15.1</u>	
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			





## Login Sample Receipt Checklist

Client: Keokuk Steel Castings

Job Number: 310-277859-1

**Login Number: 277859**

**List Source: Eurofins Cedar Falls**

**List Number: 1**

**Creator: Homolar, Dana J**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	Requested analyses are not listed on COC
Is the Field Sampler's name present on COC?	True	logged in per container on the label
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	