

**From:** [Wesley Fleming](#)  
**To:** [Freeman, Lori](#); [Hummel, Lindsey](#)  
**Cc:** [Kristen Belcredi](#); [Sara G. Guss](#); [tpritts@jaewon.co.kr](mailto:tpritts@jaewon.co.kr); [jhchoi@jaewon.co.kr](mailto:jhchoi@jaewon.co.kr)  
**Subject:** JWA Co. Ltd. - Cathode Slurry Recycling  
**Date:** Tuesday, September 24, 2024 5:46:15 PM  
**Attachments:** [image001.png](#)  
[Cathode Slurry Information for IDEM v5 Final.pdf](#)

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Dear Lori Freeman,

On behalf of our client, JWA Co., Ltd. (JWA), KERAMIDA is submitting the attached information regarding JWA's proposed management of a recyclable commodity known as "cathode slurry." KERAMIDA and JWA are providing the attached information to IDEM to ensure JWA is managing the cathode slurry material in a manner that is compliant with state and federal regulations. We appreciate IDEM's willingness to participate in the conference call held on August 23, 2024. As a follow-up to that call, KERAMIDA is providing the attached information to solicit feedback from IDEM regarding the planned management practices of the cathode slurry. KERAMIDA requests that IDEM review this information and provide confirmation that JWA's planned processes comply with solid waste requirements or provide guidance to ensure compliance.

Thank you again for your willingness to work with KERAMIDA and JWA on this important project! Please do not hesitate to reach out to me with any questions about the attached information or JWA's proposed management and recycling of the cathode slurry. We look forward to your response.

Best Regards,  
Wesley

**Wesley Fleming, P.E.**

Senior Vice President, Compliance Engineering Services



KERAMIDA Inc.

**WBENC-Certified Woman-Owned Business**

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[Schedule a meeting with me](#)

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September 23, 2024

Lori Freeman  
Compliance & Enforcement Branch Chief  
IDEM Office of Land Quality  
[lfreeman@idem.IN.gov](mailto:lfreeman@idem.IN.gov)

RE: Solid Waste Determination  
"Cathode Slurry" Material  
JWA Co. Ltd., Kokomo, IN

Dear Lori Freeman:

On behalf of our client, JWA Co., Ltd. (JWA), located at 1679 E Sparks Road, Kokomo, IN 46901, KERAMIDA Inc. (KERAMIDA) is submitting information regarding JWA's proposed management of a recyclable commodity known as "cathode slurry." The cathode slurry is a mixture containing N-methyl-2-pyrrolidone (NMP) and valuable metals, including cobalt, lithium, nickel, and aluminum). The cathode slurry is generated by Starplus Energy (SPE) in its electric vehicle battery manufacturing processes at the SPE facility adjacent to JWA. JWA intends to receive the cathode slurry material from SPE to recover valuable materials for use as feedstocks in electric vehicle battery related manufacturing processes. KERAMIDA and JWA are providing the information below to IDEM to ensure JWA is managing the cathode slurry material in a manner that is compliant with state and federal regulations. We appreciate IDEM's willingness to participate in the conference call held on August 23, 2024. As a follow-up to that call, KERAMIDA is providing the information in this letter to solicit feedback from IDEM regarding the planned management practices of the cathode slurry.

## Facility Description

JWA is a chemical manufacturing facility located in Kokomo, adjacent to the SPE battery plant. JWA's facility is currently under construction, with full startup expected by the end of 2024. JWA's initial facility plans included two primary processes: NMP purification via vacuum distillation, and production of a conductive slurry known as "TDS-L."

JWA receives diluted NMP from SPE via aboveground pipeline. JWA also receives diluted NMP from other customers via portable containers or tanker trucks. JWA feeds the diluted NMP into its vacuum distillation process to remove water from the material and produce a final product that is >99% NMP. The purified NMP is then returned to SPE via pipeline, and to other customers via tote or tanker truck.

JWA produces the "TDS-L" product through a series of mixing vessels that combine NMP solvent with other compounds to produce the conductive slurry in accordance with customer specifications. The main component (>90%) of the TDS-L is NMP, fed from JWA's own distillation process described above. JWA provides the TDS-L product to SPE as well as other customers.

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## Cathode Slurry

SPE generates a material known as "cathode slurry" as part of its manufacturing process. SPE washes down a specific piece of equipment on a routine basis using NMP solvent as the washing agent. This process generates a mixture of NMP, cathode active material (including valuable metals), and TDS-L. The "washing" is completed in a controlled manner such that the wash-down is *not* contaminated with debris or foreign chemicals. The wash-down is collected for recovery of the valuable components of the cathode slurry, including the metals, and NMP.

The cathode slurry is a mixture containing NMP, Cathode Active Material (an oxide of valuable metals including cobalt, lithium, nickel, and aluminum), polyvinylidene fluoride binders, conductive carbon (SA14A), and TDS-L. The NMP and TDS-L components are supplied by JWA.

## Exemption from the Definition of a Solid Waste

In accordance with Indiana Code (IC) 13-11-2-205 and IDEM OLQ guidance, KERAMIDA and JWA believe the cathode slurry is **not** a solid waste for the following reasons:

1. The material, if discarded, would **not** be a hazardous waste under 40 CFR 262.11.
2. The materials recovered from the cathode slurry will be used by a manufacturer as an ingredient in or a component of a product, or as a commodity in a process that results in a product.

Additional detail about each of these claims is provided in the sections below.

## Nonhazardous Determination

JWA performed waste characterization on the cathode slurry using lab analysis. KERAMIDA used data from the product Safety Data Sheets (SDSs) provided by SPE, the generator of the cathode slurry, to assess each component of the cathode slurry for the presence of any of the four hazardous waste characteristics. **None of the components of the cathode slurry evaluated are characteristically ignitable, corrosive, reactive, or toxic, based on the criteria given in 40 CFR 261.21-24. KERAMIDA also verified that none of the raw materials and final products evaluated are listed in Subpart D – Lists of Hazardous Waste.** The materials evaluated are not, based on their source and/or composition, included on the F, K, P, or U lists of hazardous waste (40 CFR Part 261.30-33).

JWA then analyzed multiple samples of the cathode slurry by TCLP to ensure the material would not be characteristically hazardous for toxicity. The laboratory analytical report is attached, and a summary is provided in Table 1. Three (3) totes were sampled to examine variability among totes. All results were below detectable limits and hazardous waste thresholds.

**Table 1:** Cathode Slurry Waste Characterization TCLP Results (samples collected 8/30/2024)

TCLP <sup>1</sup> Analytical Result (mg/l)	Sample Name			TCLP Regulatory Threshold (mg/l)
	TOTE 31 HA1	TOTE 24700	TOTE GNX	
<b>Metals</b>				
Arsenic	<0.01	<0.01	<0.01	5
Barium	<0.1	<0.1	<0.1	100
Cadmium	<0.005	<0.005	<0.005	1
Chromium	<0.01	<0.01	<0.01	5
Lead	<0.01	<0.01	<0.01	5
Mercury	<0.002	<0.002	<0.002	0.2
Selenium	<0.01	<0.01	<0.01	1
Silver	<0.05	<0.05	<0.05	5
<b>VOC</b>				
Benzene	<0.1	<0.1	<0.1	0.5
Methyl ethyl ketone (MEK)	<0.2	<0.2	<0.2	200
Carbon Tetrachloride	<0.1	<0.1	<0.1	0.5
Chlorobenzene	<0.1	<0.1	<0.1	100
Chloroform	<0.1	<0.1	<0.1	6
1,2-Dichloroethane	<0.1	<0.1	<0.1	0.5
1,1-Dichloroethene	<0.1	<0.1	<0.1	0.7
Tetrachloroethene	<0.1	<0.1	<0.1	0.7
Trichloroethene	<0.1	<0.1	<0.1	0.5
Vinyl Chloride	<0.04	<0.04	<0.04	0.2
<b>SVOCs</b>				
1,4-Dichlorobenzene	<0.1	<0.1	<0.1	7.5
2,4-Dinitrotoluene	<0.1	<0.1	<0.1	0.13
Hexachlorobenzene	<0.1	<0.1	<0.1	0.13
Hexachlorobutadiene	<0.1	<0.1	<0.1	0.5
Hexachloroethane	<0.1	<0.1	<0.1	3
o-Cresol	<0.1	<0.1	<0.1	200
m&P-Cresol	<0.1	<0.1	<0.1	200
Nitrobenzene	<0.1	<0.1	<0.1	2
Pentachlorophenol	<0.5	<0.5	<0.5	100
Pyridine	<0.5	<0.5	<0.5	5
2,4,5-Trichlorophenol	<0.1	<0.1	<0.1	400
2,4,6-Trichlorophenol	<0.1	<0.1	<0.1	0.2

[1] Chlordane, Endrin, Heptachlor, Lindane, Methoxychlor, Toxaphene, and Silvex were not analyzed based on generator knowledge.

## Use by a Manufacturer

The cathode slurry obtained from SPE will be treated as a commodity and stored at JWA's manufacturing facility. To facilitate the logistics of transporting and storing the cathode slurry material, JWA will also utilize a third-party warehouse near JWA's Sparks Road facility to store the cathode slurry for a limited time prior to recycling. JWA utilizes this same warehouse to support the logistics of the other raw materials used in JWA's manufacturing process. The cathode slurry will be received and stored in totes.

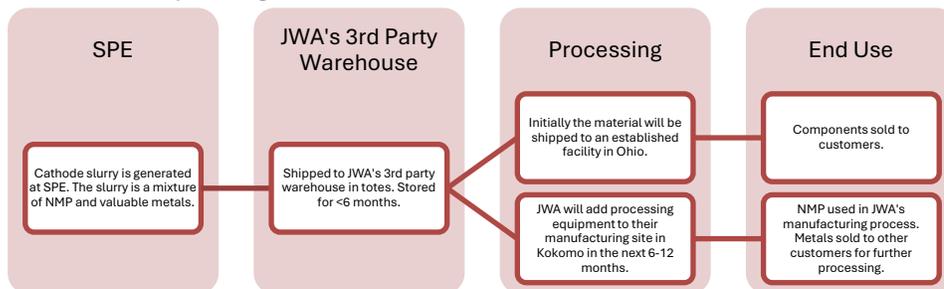
Initially, the cathode slurry will be shipped by JWA to an established processing facility in Ohio. The Ohio facility will process the cathode slurry to separate the NMP solvent and valuable metals. The recycled NMP and metals will be used by a manufacturer as an ingredient in or a component of a product, or as a commodity in a process that results in a product.

JWA is currently in the process of designing and constructing its own facility for processing the cathode slurry. Once established, JWA will process the cathode slurry at its own manufacturing site adjacent to SPE. The recovered NMP will be fed directly back into JWA's distillation process. The recovered metals will be sold to customers for further processing and eventual use by a manufacturer as an ingredient in or a component of a product, or as a commodity in a process that results in a product.

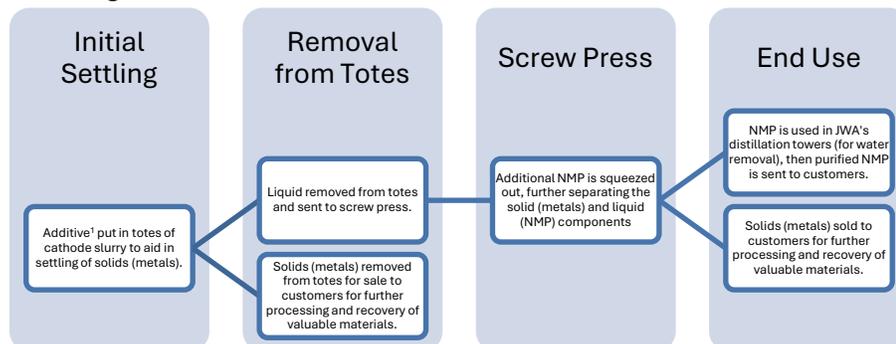
Although a small portion of the cathode slurry may be unusable (generated as a waste during the recycling process), this unused portion will not exceed 10% of the cathode slurry material received by the facility.

**Figure 1** shows the overall movement and management of the cathode slurry. **Figure 2** shows a more detailed flow chart of the recycling steps.

**Figure 1: Cathode Slurry Management Overview**



**Figure 2: Processing and Use**



[1] Additive will be selected later, but will be similar to polymers typically added to wastewater treatment systems to enhance the removal of metals

## Conclusion

Based on the above management practices and the classification of the material as nonhazardous, JWA wishes to further clarify that the material is not a solid waste in Indiana per IC 13-11-2-205(a)(5)(C)(i) and (ii) because "the material is used:

- (i) by a manufacturer as an ingredient in or a component of a product; or
- (ii) as a commodity in a process that results in a product."

JWA has reviewed IDEM's Fact Sheet (DE0922L) titled "New Rule Definition of Solid Waste 2022" and intends to ensure the following.

1. JWA has plans to utilize a significant portion of the cathode slurry (the liquid NMP fraction) in its own manufacturing process and will sell the remaining solids (including valuable metals) to other manufacturers for their use. JWA will ensure that all recipients of the cathode slurry also use it as an ingredient or component in a product or process, thereby minimizing the risk of disposal. Overall, greater than 90% of the cathode slurry will be used by JWA and other manufacturers, ensuring that less than 10% is disposed.
2. The material will be stored in totes as a valuable commodity. Storage will be on an impervious pad or inside a building. The material will not be exposed to wind or water or escape the property by other means.
3. The material will not be stored for longer than six (6) months.
4. JWA will maintain records to demonstrate that the material is being used as a valuable commodity. The records will include time periods and the volumes of material 1) accepted, 2) processed, 3) sent for use/sold, and 4) sent for disposal.

KERAMIDA requests that IDEM review the above information and provide confirmation that JWA's planned processes comply with solid waste requirements or provide guidance to ensure compliance.

Sincerely,

**KERAMIDA Inc.**

*Kristen Belcredi*

Kristen Belcredi, P.E.  
Senior Vice President

*Wesley Fleming*

Wesley Fleming, P.E.  
Senior Vice President

Attachments: TCLP Analytical Report



**ENVision Laboratories, Inc.**  
1439 Sadlier Circle West Drive  
Indianapolis, IN 46239  
Tel: 317.351.8632  
Fax: 317.351.8639  
[www.envisionlaboratories.com](http://www.envisionlaboratories.com)

Ms. Kate Paxson  
Keramida Environmental, Inc.  
401 North College Avenue  
Indianapolis, IN 46202

September 16, 2024

ENVision Project Number: 2024-1947  
Client Project Name: JWA Slurry Sample

Dear Ms. Paxson,

Please find the attached analytical report for the samples received September 5, 2024. All test methods performed were fully compliant with local, state, and federal EPA methods unless otherwise noted. The project was analyzed as requested on the enclosed chain of custody record. Please review the comments section for additional information about your results or Quality Control data.

Feel free to contact me if you have any questions or comments regarding your analytical report or service.

Thank you for your business. ENVision Laboratories looks forward to working with you on your next project.

Yours Sincerely,

A handwritten signature in black ink that reads 'Cheryl A. Crum'. The signature is written in a cursive style.

Cheryl A. Crum

Director of Project Management  
ENVision Laboratories, Inc.



Analytical Report

**Client Name:** KERAMIDA  
**Project ID:** JWA SLURRY SAMPLE  
**Client Project Manager:** KATE PAXSON  
**ENVision Project Number:** 2024-1947

**Analytical Method:** TCLP VOC Method 5035A/8260B  
**Prep Method:** EPA 1311  
**Analytical Batch:** 090624tclp

**Client Sample ID:** TOTE 31HA1 (1 3 2)      **Sample Collection Date/Time:** 8/30/24      8:15  
**Envision Sample Number:** 24-12469      **Sample Received Date/Time:** 9/5/24      9:02  
**Sample Matrix:** WATER

<u>Compounds</u>	<u>Sample Results (mg/L)</u>	<u>Reporting Limit (mg/L)</u>	<u>Flags</u>
Benzene	< 0.1	0.1	
Methyl ethyl ketone (MEK)	< 0.2	0.2	
Carbon Tetrachloride	< 0.1	0.1	
Chlorobenzene	< 0.1	0.1	
Chloroform	< 0.1	0.1	
1,2-Dichloroethane	< 0.1	0.1	
1,1-Dichloroethene	< 0.1	0.1	
Tetrachloroethene	< 0.1	0.1	
Trichloroethene	< 0.1	0.1	
Vinyl Chloride	< 0.04	0.04	
Dibromofluoromethane (surrogate)	104%		
1,2-Dichloroethane-d4 (surrogate)	109%		
Toluene-d8 (surrogate)	92%		
4-bromofluorobenzene (surrogate)	92%		
Analysis Date/Time:	9-6-24/18:10		
Analyst Initials	tjg		



**Client Name:** KERAMIDA  
**Project ID:** JWA SLURRY SAMPLE  
**Client Project Manager:** KATE PAXSON  
**ENVision Project Number:** 2024-1947

**Analytical Method:** TCLP BNA Compounds Method 3510C/8270C  
**Prep Method:** EPA 1311  
**Analytical Batch:** 090924TCLP1

**Client Sample ID:** TOTE 31HA1 (1 3 2)      **Sample Collection Date/Time:** 8/30/24      8:15  
**Envision Sample Number:** 24-12469      **Sample Received Date/Time:** 9/5/24      9:02  
**Sample Matrix:** WATER

<u>Compounds</u>	<u>Sample Results (mg/L)</u>	<u>Reporting Limit (mg/L)</u>	<u>Flags</u>
1,4-Dichlorobenzene	< 0.1	0.1	
2,4-Dinitrotoluene	< 0.1	0.1	
Hexachlorobenzene	< 0.1	0.1	
Hexachlorobutadiene	< 0.1	0.1	
Hexachloroethane	< 0.1	0.1	
o-Cresol	< 0.1	0.1	
m&P-Cresol	< 0.1	0.1	
Nitrobenzene	< 0.1	0.1	
Pentachlorophenol	< 0.5	0.5	
Pyridine	< 0.5	0.5	
2,4,5-Trichlorophenol	< 0.1	0.1	
2,4,6-Trichlorophenol	< 0.1	0.1	

2-Fluorophenol (surrogate)      77%  
 Phenol-d6 (surrogate)      45%  
 Nitrobenzene-d5 (surrogate)      83%  
 2-Fluorobiphenyl (surrogate)      30%  
 2,4,6-Tribromophenol (surrogate)      63%  
 p-Terphenyl-d14 (surrogate)      37%  
**Analysis Date/Time:** 09-10-24/13:58  
**Analyst Initials:** gjd  
**Date Extracted:** 9/9/24  
**Initial Sample Volume:** 200 mL  
**Final Volume:** 8 mL



**Client Name:** KERAMIDA  
**Project ID:** JWA SLURRY SAMPLE  
**Client Project Manager:** KATE PAXSON  
**ENVision Project Number:** 2024-1947

**Analytical Method:** TCLP Metals 6010B ICP /  
 7470A Mercury  
**Prep Method:** EPA 1311

**Client Sample ID:** TOTE 31HA1 (1 3 2)      **Sample Collection Date/Time:** 8/30/24      8:15  
**Envision Sample Number:** 24-12469      **Sample Received Date/Time:** 9/5/24      9:02  
**Sample Matrix:** WATER

<u>Compounds</u>	<u>Sample Results (mg/L)</u>	<u>Reporting Limit (mg/L)</u>	<u>Flags</u>
Arsenic, TCLP	< 0.01	0.01	
Barium, TCLP	< 0.1	0.1	
Cadmium, TCLP	< 0.005	0.005	
Chromium, TCLP	< 0.01	0.01	
Lead, TCLP	< 0.01	0.01	
Mercury, TCLP	< 0.002	0.002	
Selenium, TCLP	< 0.01	0.01	
Silver, TCLP	< 0.05	0.05	

Analysis Date/Time:	9-9-24/11:20	Hg Analysis Date/Time:	09/11/24/15:28
Analyst Initials:	gjd	Hg Analyst Initials:	gjd
Date Digested:	9/5/2024	Date Digested:	9/10/2024
Initial Sample Volume:	50 mL	Initial Sample Volume:	50 mL
Final Volume:	50 mL	Final Volume:	50 mL
Analytical Batch:	090624icp	Analytical Batch:	091124hg



Analytical Report

**Client Name:** KERAMIDA  
**Project ID:** JWA SLURRY SAMPLE  
**Client Project Manager:** KATE PAXSON  
**ENVision Project Number:** 2024-1947  
**Analytical Method:** TCLP VOC Method 5035A/8260B  
**Prep Method:** EPA 1311  
**Analytical Batch:** 090624tclp

**Client Sample ID:** TOTE 24700 (1 3 2)      **Sample Collection Date/Time:** 8/30/24      8:30  
**Envision Sample Number:** 24-12470      **Sample Received Date/Time:** 9/5/24      9:02  
**Sample Matrix:** WATER

<u>Compounds</u>	<u>Sample Results (mg/L)</u>	<u>Reporting Limit (mg/L)</u>	<u>Flags</u>
Benzene	< 0.1	0.1	
Methyl ethyl ketone (MEK)	< 0.2	0.2	
Carbon Tetrachloride	< 0.1	0.1	
Chlorobenzene	< 0.1	0.1	
Chloroform	< 0.1	0.1	
1,2-Dichloroethane	< 0.1	0.1	
1,1-Dichloroethene	< 0.1	0.1	
Tetrachloroethene	< 0.1	0.1	
Trichloroethene	< 0.1	0.1	
Vinyl Chloride	< 0.04	0.04	
Dibromofluoromethane (surrogate)	106%		
1,2-Dichloroethane-d4 (surrogate)	109%		
Toluene-d8 (surrogate)	95%		
4-bromofluorobenzene (surrogate)	89%		
Analysis Date/Time:	9-6-24/18:25		
Analyst Initials	tjg		



**Client Name:** KERAMIDA  
**Project ID:** JWA SLURRY SAMPLE  
**Client Project Manager:** KATE PAXSON  
**ENVision Project Number:** 2024-1947

**Analytical Method:** TCLP BNA Compounds Method 3510C/8270C  
**Prep Method:** EPA 1311  
**Analytical Batch:** 090924TCLP1

**Client Sample ID:** TOTE 24700 (1 3 2)      **Sample Collection Date/Time:** 8/30/24      8:30  
**Envision Sample Number:** 24-12470      **Sample Received Date/Time:** 9/5/24      9:02  
**Sample Matrix:** WATER

<u>Compounds</u>	<u>Sample Results (mg/L)</u>	<u>Reporting Limit (mg/L)</u>	<u>Flags</u>
1,4-Dichlorobenzene	< 0.1	0.1	
2,4-Dinitrotoluene	< 0.1	0.1	
Hexachlorobenzene	< 0.1	0.1	
Hexachlorobutadiene	< 0.1	0.1	
Hexachloroethane	< 0.1	0.1	
o-Cresol	< 0.1	0.1	
m&P-Cresol	< 0.1	0.1	
Nitrobenzene	< 0.1	0.1	
Pentachlorophenol	< 0.5	0.5	
Pyridine	< 0.5	0.5	
2,4,5-Trichlorophenol	< 0.1	0.1	
2,4,6-Trichlorophenol	< 0.1	0.1	
2-Fluorophenol (surrogate)	79%		
Phenol-d6 (surrogate)	46%		
Nitrobenzene-d5 (surrogate)	76%		
2-Fluorobiphenyl (surrogate)	38%		
2,4,6-Tribromophenol (surrogate)	81%		
p-Terphenyl-d14 (surrogate)	37%		
Analysis Date/Time:	09-10-24/14:25		
Analyst Initials:	gjd		
Date Extracted:	9/9/24		
Initial Sample Volume:	200 mL		
Final Volume:	6 mL		



**Client Name:** KERAMIDA  
**Project ID:** JWA SLURRY SAMPLE  
**Client Project Manager:** KATE PAXSON  
**ENVision Project Number:** 2024-1947

**Analytical Method:** TCLP Metals 6010B ICP /  
 7470A Mercury  
**Prep Method:** EPA 1311

**Client Sample ID:** TOTE 24700 (1 3 2)      **Sample Collection Date/Time:** 8/30/24      8:30  
**Envision Sample Number:** 24-12470      **Sample Received Date/Time:** 9/5/24      9:02  
**Sample Matrix:** WATER

<u>Compounds</u>	<u>Sample Results (mg/L)</u>	<u>Reporting Limit (mg/L)</u>	<u>Flags</u>
Arsenic, TCLP	< 0.01	0.01	
Barium, TCLP	< 0.1	0.1	
Cadmium, TCLP	< 0.005	0.005	
Chromium, TCLP	< 0.01	0.01	
Lead, TCLP	< 0.01	0.01	
Mercury, TCLP	< 0.002	0.002	
Selenium, TCLP	< 0.01	0.01	
Silver, TCLP	< 0.05	0.05	

<b>Analysis Date/Time:</b> 9-9-24/11:23	<b>Hg Analysis Date/Time:</b> 09/11/24/15:30hg
<b>Analyst Initials:</b> gjd	<b>Hg Analyst Initials:</b> gjd
<b>Date Digested:</b> 9/5/2024	<b>Date Digested:</b> 9/10/2024
<b>Initial Sample Volume:</b> 50 mL	<b>Initial Sample Volume:</b> 50 mL
<b>Final Volume:</b> 50 mL	<b>Final Volume:</b> 50 mL
<b>Analytical Batch:</b> 090624icp	<b>Analytical Batch:</b> 091124hg



Analytical Report

**Client Name:** KERAMIDA  
**Project ID:** JWA SLURRY SAMPLE  
**Client Project Manager:** KATE PAXSON  
**ENVision Project Number:** 2024-1947  
**Analytical Method:** TCLP VOC Method 5035A/8260B  
**Prep Method:** EPA 1311  
**Analytical Batch:** 090624tclp

**Client Sample ID:** TOTE GNX (1 3 2)      **Sample Collection Date/Time:** 8/30/24      8:45  
**Envision Sample Number:** 24-12471      **Sample Received Date/Time:** 9/5/24      9:02  
**Sample Matrix:** WATER

<u>Compounds</u>	<u>Sample Results (mg/L)</u>	<u>Reporting Limit (mg/L)</u>	<u>Flags</u>
Benzene	< 0.1	0.1	
Methyl ethyl ketone (MEK)	< 0.2	0.2	
Carbon Tetrachloride	< 0.1	0.1	
Chlorobenzene	< 0.1	0.1	
Chloroform	< 0.1	0.1	
1,2-Dichloroethane	< 0.1	0.1	
1,1-Dichloroethene	< 0.1	0.1	
Tetrachloroethene	< 0.1	0.1	
Trichloroethene	< 0.1	0.1	
Vinyl Chloride	< 0.04	0.04	
Dibromofluoromethane (surrogate)	103%		
1,2-Dichloroethane-d4 (surrogate)	106%		
Toluene-d8 (surrogate)	91%		
4-bromofluorobenzene (surrogate)	90%		
Analysis Date/Time:	9-6-24/18:40		
Analyst Initials	tjg		



**Client Name:** KERAMIDA  
**Project ID:** JWA SLURRY SAMPLE  
**Client Project Manager:** KATE PAXSON  
**ENVision Project Number:** 2024-1947

**Analytical Method:** TCLP BNA Compounds Method 3510C/8270C  
**Prep Method:** EPA 1311  
**Analytical Batch:** 090924TCLP1

**Client Sample ID:** TOTE GNX (1 3 2)      **Sample Collection Date/Time:** 8/30/24      8:45  
**Envision Sample Number:** 24-12471      **Sample Received Date/Time:** 9/5/24      9:02  
**Sample Matrix:** WATER

<u>Compounds</u>	<u>Sample Results (mg/L)</u>	<u>Reporting Limit (mg/L)</u>	<u>Flags</u>
1,4-Dichlorobenzene	< 0.1	0.1	
2,4-Dinitrotoluene	< 0.1	0.1	
Hexachlorobenzene	< 0.1	0.1	
Hexachlorobutadiene	< 0.1	0.1	
Hexachloroethane	< 0.1	0.1	
o-Cresol	< 0.1	0.1	
m&P-Cresol	< 0.1	0.1	
Nitrobenzene	< 0.1	0.1	
Pentachlorophenol	< 0.5	0.5	
Pyridine	< 0.5	0.5	
2,4,5-Trichlorophenol	< 0.1	0.1	
2,4,6-Trichlorophenol	< 0.1	0.1	
2-Fluorophenol (surrogate)	54%		
Phenol-d6 (surrogate)	62%		
Nitrobenzene-d5 (surrogate)	84%		
2-Fluorobiphenyl (surrogate)	27%		
2,4,6-Tribromophenol (surrogate)	62%		
p-Terphenyl-d14 (surrogate)	31%		
Analysis Date/Time:	09-10-24/15:19		
Analyst Initials:	gjd		
Date Extracted:	9/9/24		
Initial Sample Volume:	200 mL		
Final Volume:	5 mL		



**Client Name:** KERAMIDA  
**Project ID:** JWA SLURRY SAMPLE  
**Client Project Manager:** KATE PAXSON  
**ENVision Project Number:** 2024-1947

**Analytical Method:** TCLP Metals 6010B ICP /  
 7470A Mercury  
**Prep Method:** EPA 1311

**Client Sample ID:** TOTE GNX (1 3 2)      **Sample Collection Date/Time:** 8/30/24      8:45  
**Envision Sample Number:** 24-12471      **Sample Received Date/Time:** 9/5/24      9:02  
**Sample Matrix:** WATER

<u>Compounds</u>	<u>Sample Results (mg/L)</u>	<u>Reporting Limit (mg/L)</u>	<u>Flags</u>
Arsenic, TCLP	< 0.01	0.01	
Barium, TCLP	< 0.1	0.1	
Cadmium, TCLP	< 0.005	0.005	
Chromium, TCLP	< 0.01	0.01	
Lead, TCLP	< 0.01	0.01	
Mercury, TCLP	< 0.002	0.002	
Selenium, TCLP	< 0.01	0.01	
Silver, TCLP	< 0.05	0.05	

Analysis Date/Time:	9-9-24/11:30	Hg Analysis Date/Time:	09/11/24/15:31hg
Analyst Initials:	gjd	Hg Analyst Initials:	gjd
Date Digested:	9/5/2024	Date Digested:	9/10/2024
Initial Sample Volume:	50 mL	Initial Sample Volume:	50 mL
Final Volume:	50 mL	Final Volume:	50 mL
Analytical Batch:	090624icp	Analytical Batch:	091124hg



**TCLP VOC Quality Control Data**

**ENVision Batch Number:** 090624tclp

<b><u>Method Blank (MB):</u></b>	<b><u>MB Results (mg/L)</u></b>	<b><u>Rep Lim (mg/L)</u></b>	<b><u>Flag</u></b>
Benzene	< 0.1	0.1	
Methyl ethyl ketone (MEK)	< 0.2	0.2	
Carbon Tetrachloride	< 0.1	0.1	
Chlorobenzene	< 0.1	0.1	
Chloroform	< 0.1	0.1	
1,2-Dichloroethane	< 0.1	0.1	
1,1-Dichloroethene	< 0.1	0.1	
Tetrachloroethene	< 0.1	0.1	
Trichloroethene	< 0.1	0.1	
Vinyl Chloride	< 0.04	0.04	
Dibromofluoromethane (surrogate)	103%		
1,2-Dichloroethane-d4 (surrogate)	111%		
Toluene-d8 (surrogate)	94%		
4-bromofluorobenzene (surrogate)	93%		
Analysis Date/Time:	9-6-24/17:09		
Analyst Initials	tjg		

<b><u>Laboratory Control Standard (LCS):</u></b>	<b><u>LCS Results (ug/L)</u></b>	<b><u>LCS Conc (ug/L)</u></b>	<b><u>% Rec</u></b>	<b><u>Flag</u></b>
Benzene	55.2	50	110%	
Methyl ethyl ketone (MEK)	129	125	103%	
Carbon Tetrachloride	50.4	50	101%	
Chlorobenzene	57.7	50	115%	
Chloroform	55.1	50	110%	
1,2-Dichloroethane	56.4	50	113%	
1,1-Dichloroethene	55.2	50	110%	
Tetrachloroethene	51.8	50	104%	
Trichloroethene	53.5	50	107%	
Vinyl Chloride	51.1	50	102%	
Dibromofluoromethane (surrogate)	98%			
1,2-Dichloroethane-d4 (surrogate)	103%			
Toluene-d8 (surrogate)	101%			
4-bromofluorobenzene (surrogate)	95%			
Analysis Date/Time:	9-6-24/16:23			
Analyst Initials	tjg			



**TCLP SVOC Quality Control Data**

ENVision Batch Number: 090924TCLP1

<u>Method Blank (MB):</u>	<u>Method Blank Results (mg/L)</u>	<u>Reporting Limit (mg/L)</u>	<u>Flag</u>
1,4-Dichlorobenzene	< 0.05	0.05	
2,4-Dinitrotoluene	< 0.05	0.05	
Hexachlorobenzene	< 0.05	0.05	
Hexachlorobutadiene	< 0.05	0.05	
Hexachloroethane	< 0.05	0.05	
o-Cresol	< 0.05	0.05	
m&P-Cresol	< 0.05	0.05	
Nitrobenzene	< 0.05	0.05	
Pentachlorophenol	< 0.25	0.25	
Pyridine	< 0.25	0.25	
2,4,5-Trichlorophenol	< 0.05	0.05	
2,4,6-Trichlorophenol	< 0.05	0.05	
2-Fluorophenol (surrogate)	41%		
Phenol-d6 (surrogate)	43%		
Nitrobenzene-d5 (surrogate)	85%		
2-Fluorobiphenyl (surrogate)	101%		
2,4,6-Tribromophenol (surrogate)	83%		
p-Terphenyl-d14 (surrogate)	82%		
Analysis Date/Time:	09-10-24/13:32		
Analyst Initials:	gjd		
Date Extracted:	9/9/2024		
Initial Sample Volume:	200 mL		
Final Volume:	1.0 mL		

<u>Matrix Spike</u>	<u>Sample Result</u>	<u>MS Result</u>	<u>Spike Conc.</u>	<u>MS Recovery</u>	<u>Flag</u>
1,4-Dichlorobenzene	0.00	20.11	50	40.2%	
2,4-Dinitrotoluene	0.00	22.38	50	44.8%	
Hexachlorobenzene	0.00	24.61	50	49.2%	
Hexachlorobutadiene	0.00	22.32	50	44.6%	
Hexachloroethane	0.00	18.02	50	36.0%	
o-Cresol	0.00	25.90	100	25.9%	
m&P-Cresol	0.00	16.45	100	16.5%	
Nitrobenzene	0.00	24.11	50	48.2%	
Pentachlorophenol	0.00	23.67	100	23.7%	
Pyridine	0.00	25.64	50	51.3%	
2,4,5-Trichlorophenol	0.00	23.72	100	23.7%	
2,4,6-Trichlorophenol	0.00	21.18	100	21.2%	



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**8270 QC Data Continued...**

2-Fluorophenol (surrogate)	79%	73%
Phenol-d6 (surrogate)	46%	62%
Nitrobenzene-d5 (surrogate)	76%	80%
2-Fluorobiphenyl (surrogate)	38%	33%
2,4,6-Tribromophenol (surrogate)	81%	70%
p-Terphenyl-d14 (surrogate)	37%	34%
Analysis Date/Time:	09-10-24/14:25	09-10-24/14:52
Analyst Initials:	gjd	NR
Date Extracted:	9/9/2024	9/9/2024
Initial Sample Volume:	200 mL	200 mL
Final Volume:	6ML	4ML
Spiked sample number:	24-12470	



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**EPA 6010B/7470A TCLP Metals Quality Control Data**

**ENVision Batch Number:** 090624icp/091124hg

<u>Method Blank (MB):</u>	<u>MB Results (mg/kg)</u>	<u>Rep Lim (mg/L)</u>	<u>Flag</u>
Arsenic	< 2	0.01	
Barium	< 2	0.1	
Cadmium	< 2	0.005	
Chromium	< 2	0.01	
Lead	< 2	0.01	
Mercury	< 1	0.002	
Selenium	< 2	0.01	
Silver	< 2	0.05	

Analysis Date/Time: 9-6-24/10:08icp/09/11/24/12:35hg

Analyst Initials: gjd

<u>Laboratory Control Standard (LCS):</u>	<u>LCS Results(ppm)</u>	<u>LCS Conc(mg/L)</u>	<u>% Rec</u>	<u>Flag</u>
Arsenic	0.47	0.50	94	
Barium	0.53	0.50	106	
Cadmium	0.54	0.50	108	
Chromium	0.53	0.50	106	
Lead	0.49	0.50	98	
Mercury	0.0049	0.005	98	
Selenium	0.50	0.50	100	
Silver	0.52	0.50	104	

Analysis Date/Time: 9-6-24/10:05icp/09/11/24/12:33hg

Analyst Initials: gjd



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Flag Number

Comments

