west virginia department of environmental protection

Division of Water and Waste Management
601 57th Street SE
Charleston, WV 25304
Phone:304-926-0495/Fax: 304-926-0463

Harold D. Ward, Cabinet Secretary
dep.wv.gov

July 26, 2025

CERTIFICATION

RE: Solid Waste WV/NPDES Permit Number SWF-1034 / WV0109517
Republic Services Short Creek Landfill
Ohio County

APPEAL NO.: 25-07-EQB

I, Jeremy W. Bandy, Division of Water and Waste Management, Department of Environmental Protection, in compliance with Chapter 22B, Article 1, Section 7(e), Code of West Virginia, as amended, do hereby certify that the enclosed is a true and accurate reproduction of the record of the proceedings out of which the appeal arises including documents and correspondence in the Director's file relating to the matter in question. Due to reproduction problems, maps have been omitted. These items are available for inspection at the Division of Water and Waste Management in Charleston.

DIVISION OF WATER AND WASTE MANAGEMENT

Jeremy W. Bandy

Jeremy W. Bandy,
Director

JWB:jl
Enclosures

West Virginia Environmental Quality Board

601 57th Street, S.E.
Charleston, West Virginia 25304

Phone: (304) 414-1128
eqb.wv.gov

MEMORANDUM

DATE: July 2, 2025

TO: Jeremy W. Bandy, Director
Division of Water and Waste Management
West Virginia Department of Environmental Protection (WVDEP)

CC: Teresa Pauline, Division of Water and Waste Management, WVDEP
Yogesh Patel, Division of Water and Waste Management, WVDEP
Brad Wright, Division of Water and Waste Management, WVDEP

FROM: Kenna M. DeRaimo, Clerk KMD
Environmental Quality Board

RE: **Request for Certified File – Appeal No. 25-07-EQB**
Republic Services/Short Creek Landfill v. WVDEP

Attached is **Appeal No. 25-07-EQB**, which was filed with the Environmental Quality Board ("EQB") on **June 26, 2025**. Within fourteen (14) days after receipt of this appeal, you must prepare, certify, and provide to the EQB a complete paper record of the proceedings out of which the appeal arises, including all documents and correspondence in the Director's file relating to the matter in question.

The record must be presented in chronological order with each page consecutively numbered. **The Certified Record in this matter is due on July 16, 2025.** In addition to the paper copy, please also send an electronic copy of the complete certified record to Kenna DeRaimo, Clerk of the EQB, at Kenna.M.DeRaimo@wv.gov.

If you have any questions about what to include in the certified record, please contact the West Virginia Department of Environmental Protection's Office of Legal Services.

Thank you for your attention to this matter.

Lockhart, John V <john.v.lockhart@wv.gov>

Re: AMG Resources Short Creek Landfill

8 messages

Harsanye, Barbara <BHarsanye@republicservices.com> Mon, Mar 10, 2025 at 9:05 AM
To: "Lockhart, John V" <john.v.lockhart@wv.gov>
Cc: Bassam Y Makar <bassam.y.makar@wv.gov>, Yogesh P Patel <yogesh.p.patel@wv.gov>

Thank you.

Barb Harsanye

Manufacturing & Environmental Services

Carbon Limestone Landfill

Short Creek Landfill

8100 S Stateline Road

Lowellville, OH 44436

e bharsanye@republicservices.com

o 330-536-7579

c 330-423-7267

w RepublicServices.com

REPUBLIC SERVICES

Sustainability in Action

From: Lockhart, John V <john.v.lockhart@wv.gov>
Sent: Monday, March 10, 2025 9:01 AM
To: Harsanye, Barbara <BHarsanye@republicservices.com>
Cc: Bassam Y Makar <bassam.y.makar@wv.gov>; Yogesh P Patel <yogesh.p.patel@wv.gov>
Subject: Re: AMG Resources Short Creek Landfill

Barbara,

Just to clarify the sampling collection protocol - you do not need to collect all the samples and send them to the lab all at once after the 4 weeks. You should be collecting the samples as you go and sending them to the lab as you collect them or in small batches - i.e. maybe once a week or whatever frequency meets your hold times. We would not accept any results analyzed outside of hold time.

Hope this helps,

John V. Lockhart, P.E.

Solid Waste Permitting Supervisor

West Virginia Department of Environmental Protection

601 57th St S.E.

Charleston, WV 25304

Phone: (304) 926-0499 Ext.43889

Email: **john.v.lockhart@wv.gov**

www.dep.wv.gov

[Quoted text hidden]

Lockhart, John V <john.v.lockhart@wv.gov> Mon, Mar 10, 2025 at 9:00 AM
To: "Harsanye, Barbara" <BHarsanye@republicservices.com>
Cc: Bassam Y Makar <bassam.y.makar@wv.gov>, Yogesh P Patel <yogesh.p.patel@wv.gov>

Barbara,

Just to clarify the sampling collection protocol - you do not need to collect all the samples and send them to the lab all at once after the 4 weeks. You should be collecting the samples as you go and sending them to the lab as you collect them or in small batches - i.e. maybe once a week or whatever frequency meets your hold times. We would not accept any results analyzed outside of hold time.

Hope this helps,

John V. Lockhart, P.E.

Solid Waste Permitting Supervisor
West Virginia Department of Environmental Protection
601 57th St S.E.
Charleston, WV 25304
Phone: (304) 926-0499 Ext.43889
Email: **john.v.lockhart@wv.gov**
www.dep.wv.gov

[Quoted text hidden]

Lockhart, John V <john.v.lockhart@wv.gov> Mon, Mar 10, 2025 at 8:37 AM
To: "Makar, Bassam Y" <bassam.y.makar@wv.gov>
Cc: "Patel, Yogesh P" <yogesh.p.patel@wv.gov>

I don't understand - is she collecting all the samples over 4 weeks and then sending them to the lab? Shouldn't she be sending 3 samples a week to the lab?

John
[Quoted text hidden]

Makar, Bassam Y <bassam.y.makar@wv.gov> Fri, Mar 7, 2025 at 9:00 AM
To: "Patel, Yogesh P" <yogesh.p.patel@wv.gov>
Cc: John V Lockhart <john.v.lockhart@wv.gov>

Thank you!

Bassam Makar

WV DEP-Division of Water & Waste Mgt.

601 57th St. SE

Charleston, WV 25304-2345

Phone: (304) 926-0499 EXT 43851

Fax: (304) 926-0496

Cell: 304-550-9077

[Quoted text hidden]

Patel, Yogesh P <yogesh.p.patel@wv.gov> Fri, Mar 7, 2025 at 8:59 AM
To: "Makar, Bassam Y" <bassam.y.makar@wv.gov>
Cc: John V Lockhart <john.v.lockhart@wv.gov>

That is fine.
[Quoted text hidden]

Makar, Bassam Y <bassam.y.makar@wv.gov> Fri, Mar 7, 2025 at 8:38 AM

To: Yogesh P Patel <yogesh.p.patel@wv.gov>, John V Lockhart <john.v.lockhart@wv.gov>

25-03-13, Short Creek, AMG Resources Corp

Sirs,

As you may have noticed in below email from Short Creek in relation to my previous email requesting a special protocol for sampling, would you allow them to have their SWPU ID 24-04-32 , Short Creek, AMG Resources Corporation to have an extension for just one month till May 5, 2025 to allow them to collect the related lab results?

Thank you,

Bassam Makar

WV DEP-Division of Water & Waste Mgt.

601 57th St. SE

Charleston, WV 25304-2345

Phone: (304) 926-0499 EXT 43851

Fax: (304) 926-0496

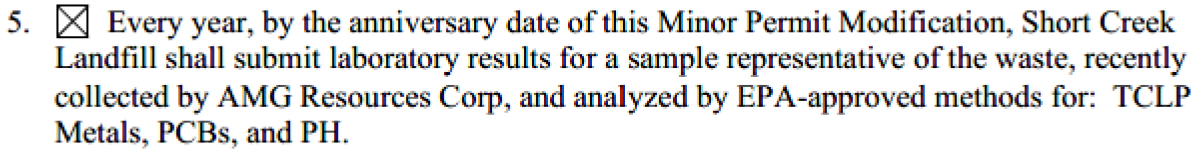
Cell: 304-550-9077

[Quoted text hidden]

AMG WV SWPU 24-04-32.pdf
232K

Harsanye, Barbara <BHarsanye@republicservices.com> Fri, Mar 7, 2025 at 8:20 AM
To: "Makar, Bassam Y" <bassam.y.makar@wv.gov>
Cc: John V Lockhart <john.v.lockhart@wv.gov>, Yogesh P Patel <yogesh.p.patel@wv.gov>, "Weigle, Sandi" <SWeigle@republicservices.com>

Bassam, I wanted to follow up with you on the shredder residue from AMG submittal. I spoke to AMG this morning and their shredder is currently down for maintenance till next week so they will not be able to start new protocol until then. The protocol will take 4 weeks to complete and their current approval expires April 5, 2025. Is there anyway to get an extension as they sample and have new analysis completed. I also wanted to check on TPH requirements as recommended hold time is 14 days from collection but protocol is sampling over 4 weeks so the TPH will be out of hold time on some of the samples. I have attached a copy of current SWPU 24-04-32 with the following condition noted:



5. ☒ Every year, by the anniversary date of this Minor Permit Modification, Short Creek Landfill shall submit laboratory results for a sample representative of the waste, recently collected by AMG Resources Corp, and analyzed by EPA-approved methods for: TCLP Metals, PCBs, and PH.

Please advise. Thank you

Barb Harsanye

Manufacturing & Environmental Services

Carbon Limestone Landfill

Short Creek Landfill

8100 S Stateline Road

Lowellville, OH 44436

e bharsanye@republicservices.com

o 330-536-7579

c 330-423-7267

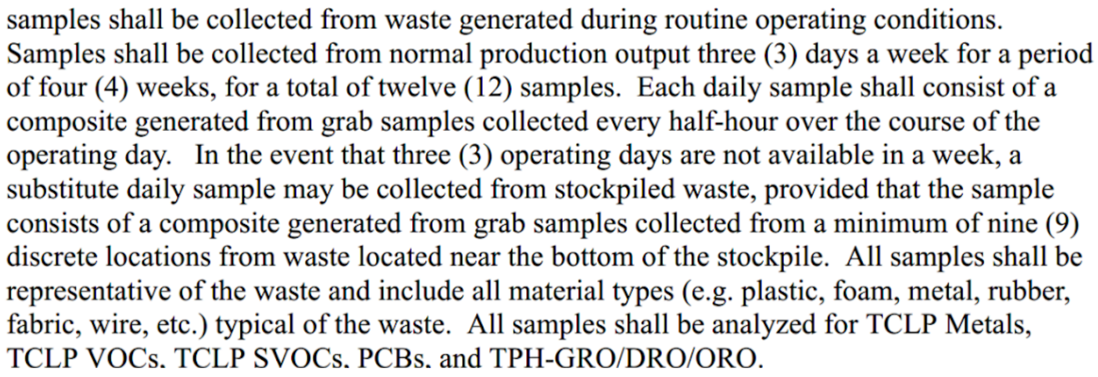
w RepublicServices.com

Sustainability in Action

From: Makar, Bassam Y <bassam.y.makar@wv.gov>
Sent: Thursday, March 6, 2025 1:34 PM
To: Harsanye, Barbara <BHarsanye@republicservices.com>
Cc: John V Lockhart <john.v.lockhart@wv.gov>; Yogesh P Patel <yogesh.p.patel@wv.gov>
Subject: Re: AMG Resources Short Creek Landfill

Good afternoon Barb,

As discussed on the phone, please consider the following protocol for sampling the auto fluff as follows:



samples shall be collected from waste generated during routine operating conditions. Samples shall be collected from normal production output three (3) days a week for a period of four (4) weeks, for a total of twelve (12) samples. Each daily sample shall consist of a composite generated from grab samples collected every half-hour over the course of the operating day. In the event that three (3) operating days are not available in a week, a substitute daily sample may be collected from stockpiled waste, provided that the sample consists of a composite generated from grab samples collected from a minimum of nine (9) discrete locations from waste located near the bottom of the stockpile. All samples shall be representative of the waste and include all material types (e.g. plastic, foam, metal, rubber, fabric, wire, etc.) typical of the waste. All samples shall be analyzed for TCLP Metals, TCLP VOCs. TCLP SVOCs. PCBs. and TPH-GRO/DRO/ORO.

Accordingly, please provide the sampling as provided in above mentioned protocol.

Thank you,

Bassam Makar

WV DEP-Division of Water & Waste Mgt.

601 57th St. SE

Charleston, WV 25304-2345

Phone: (304) 926-0499 EXT 43851

Fax: (304) 926-0496

Cell: 304-550-9077

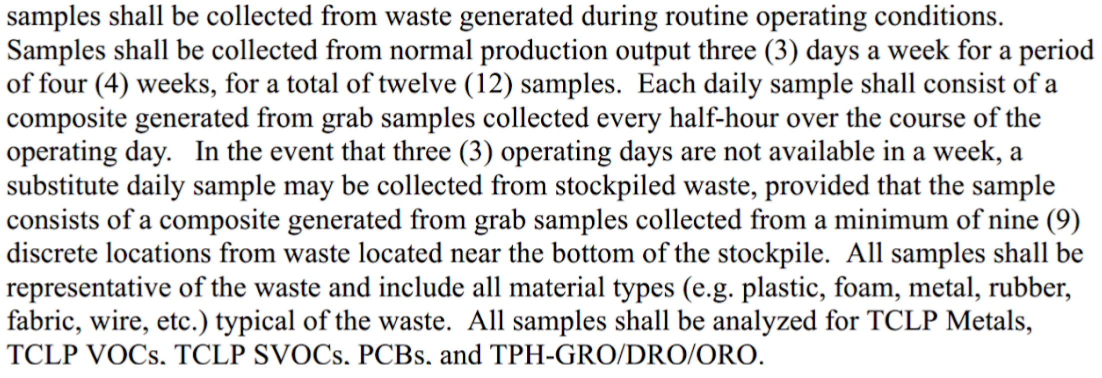
[Quoted text hidden]

AMG WV SWPU 24-04-32.pdf
232K

Makar, Bassam Y <bassam.y.makar@wv.gov> Thu, Mar 6, 2025 at 1:33 PM
To: "Harsanye, Barbara" <BHarsanye@republicservices.com>
Cc: John V Lockhart <john.v.lockhart@wv.gov>, Yogesh P Patel <yogesh.p.patel@wv.gov>

Good afternoon Barb,

As discussed on the phone, please consider the following protocol for sampling the auto fluff as follows:



samples shall be collected from waste generated during routine operating conditions. Samples shall be collected from normal production output three (3) days a week for a period of four (4) weeks, for a total of twelve (12) samples. Each daily sample shall consist of a composite generated from grab samples collected every half-hour over the course of the operating day. In the event that three (3) operating days are not available in a week, a substitute daily sample may be collected from stockpiled waste, provided that the sample consists of a composite generated from grab samples collected from a minimum of nine (9) discrete locations from waste located near the bottom of the stockpile. All samples shall be representative of the waste and include all material types (e.g. plastic, foam, metal, rubber, fabric, wire, etc.) typical of the waste. All samples shall be analyzed for TCLP Metals, TCLP VOCs. TCLP SVOCs. PCBs. and TPH-GRO/DRO/ORO.

Accordingly, please provide the sampling as provided in above mentioned protocol.

Thank you,

Bassam Makar

WV DEP-Division of Water & Waste Mgt.

601 57th St. SE

Charleston, WV 25304-2345

Phone: (304) 926-0499 EXT 43851

Fax: (304) 926-0496

Cell: 304-550-9077

On Thu, Mar 6, 2025 at 12:51 PM Harsanye, Barbara <BHarsanye@republicservices.com> wrote:

> Good afternoon, attached for your review is a submittal from AMG Resources located in Benwood WV. Currently approved under 24-04-32 which expires on 4/5/25. Thank you
>
> **Barb Harsanye**
>
> Manufacturing & Environmental Services
>
> Carbon Limestone Landfill
>
> Short Creek Landfill
>
> 8100 S Stateline Road
>
> Lowellville, OH 44436

e bharsanye@republicservices.com

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c 330-423-7267

w RepublicServices.com

REPUBLIC SERVICES

Sustainability in Action

AMG WV Profile.pdf
14938K

WEST VIRGINIA ENVIRONMENTAL QUALITY BOARD
CHARLESTON, WEST VIRGINIA

REPUBLIC SERVICES/SHORT CREEK LANDFILL,

Appellant,

Appeal No. 25-07-EQB

v.

DIRECTOR, DIVISION OF WATER AND WASTE MANAGEMENT, WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION,

Appellee.

ORDER FOR CONTINUANCE AND NOTICE OF HEARING AND PREHEARING STATUS CONFERENCE

Appeal No. 25-07-EQB was filed with the West Virginia Environmental Quality Board ("Board") on June 26, 2025. In accordance with West Virginia Code §22B-1-7(f), an evidentiary hearing concerning matters as more fully set forth in the *Notice of Appeal* filed in Appeal No. 25-07-EQB is scheduled for July 24, 2025.

The Board, on its own motion, determined that the **evidentiary hearing in Appeal No. 25-07-EQB** shall be continued until the **September 11, 2025, Board meeting beginning at 8:30 a.m.** The Parties may attend and participate in the evidentiary hearing in person or via Zoom by using the following Zoom link: https://us02web.zoom.us/j/86796843313.

Additionally, pursuant to CSR §46-4-5.2 of the *Procedural Rules Governing Appeals Before the Environmental Quality Board*, a **prehearing status conference (PHSC) will be held on Thursday, August 28, 2025, at 10:00 a.m.** before the Board's Chairman and/or legal counsel. The Parties may attend and participate by ***Zoom only*** by using this link: https://us02web.zoom.us/j/81752258861.

The proceedings will be recorded and transcribed later, if necessary. The following will be discussed at the prehearing:

(1) Presentation and consideration of preliminary legal issues;

(2) Stipulations to facts that are not contested by the parties;

(3) Stipulations to the admission of evidence to avoid unnecessary proof;

(4) Identification and reduction of number of witnesses; and

(5) Consideration of any other matters that will aid in the expeditious conduct of the hearing.

It is further ordered that each counselor representative attending the prehearing conference is required to have a thorough knowledge of the case, be prepared to discuss it, and to make stipulations or admissions where appropriate and to argue any pending motions. Each counselor representative must have full authority from the party represented and any law firm with which associated to take such action as may be necessary to comply with this order.

It is further ordered that at the conclusion of the conference, either orally for the record or by separate writing, an order will be entered which recites any action taken and agreements reached by the parties. The order will take the place of all that has taken place before and will control the subsequent course of the hearing unless modified to prevent manifest injustice.

It is so **ORDERED** and **ENTERED** this 2nd day of July, 2025.

Environmental Quality Board

Kenna M DeRaimo

for Dr. Edward Snyder, Chairman

WEST VIRGINIA ENVIRONMENTAL QUALITY BOARD
CHARLESTON, WEST VIRGINIA

REPUBLIC SERVICES/SHORT CREEK LANDFILL,

Appellant,

Appeal No. 25-07-EQB

v.

DIRECTOR, DIVISION OF WATER AND WASTE MANAGEMENT, WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION,

Appellee.

CERTIFICATE OF SERVICE

I, Kenna M. DeRaimo, Clerk for the Environmental Quality Board, hereby certify that on this day, the 2nd day of July, 2025, a true copy of the foregoing **ORDER FOR CONTINUANCE AND NOTICE OF HEARING AND PREHEARING STATUS CONFERENCE** has been served upon the following:

Samuel F. Hanna, Esq. HANNA LAW OFFICE Post Office Box 2311 3508 Noyes Avenue Charleston, West Virginia 25328-2311	***Via Certified U.S. First-Class U.S. Mail and Electronic Mail*** 9489 0090 0027 6692 2652 11
Charles S. Driver, Esq. WV DEPARTMENT OF ENVIRONMENTAL PROTECTION OFFICE OF LEGAL SERVICES 601 57th Street SE Charleston, West Virginia 25304	***Via Interdepartmental Mail and Electronic Mail***
Jeremy W. Bandy, Director WV DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF WATER AND WASTE MANAGEMENT 601 57th Street SE Charleston, WV 25304	***Via Interdepartmental Mail and Electronic Mail***

Kenna M DeRaimo

Kenna M. DeRaimo, Clerk

RECEIVED
JUN 26 2025
Environmental Quality Board

WEST VIRGINIA ENVIRONMENTAL QUALITY BOARD
CHARLESTON, WEST VIRGINIA

REPUBLIC SERVICES/SHORT CREEK LANDFILL,

Appellant,

v. **Appeal No.** 25-07-EQB

**DIRECTOR, DIVISION OF WATER AND WASTE MANAGEMENT,
DEPARTMENT OF ENVIRONMENTAL PROTECTION,**

Appellee.

NOTICE OF APPEAL

Action Complained Of: The appellant named above respectfully represents that it is aggrieved by the attached Minor Permit Modification for Disposal of Petroleum-Contaminated Material dated May 29, 2025.

Relief Requested: The appellant therefore prays that this matter be reviewed and that the Board grant the following relief: That the Auto Shredder & Nonferrous Separation Waste should be continued and allowed to be used for alternate daily coverage at Short Creek Landfill.

Specific Objections: The specific objections to the action are set forth in detail in the attached letter from Eric D. Chiao, P.E. to Yogesh Patel, P.E., dated June 20, 2025.

Dated this 26 day of June, 2025.

Samuel F. Hanna
SAMUEL F. HANNA, ESQUIRE
WV State Bar #1580
P. O. Box 2311
Charleston, WV 25328
(304) 342-2137

west virginia department of environmental protection

Division of Water and Waste Management
601 57th Street SE
Charleston, WV 25304
Phone: (304) 926-0465
Fax: (304) 926-0456

Harold D. Ward, Cabinet Secretary
dep.wv.gov

Minor Permit Modification for Disposal of Petroleum-Contaminated Material

SWPU ID: 25-05-49

Landfill: Short Creek

Generator: AMG Resources Corp.

Request Received: May 29, 2025

Request Dated: May 29, 2025

Waste: Auto Shredder & Nonferrous Separation

Generated at: Benwood, WV

Comments and/or Conditions

The following checked (X) comments and/or conditions apply:

1. ☒ The West Virginia Department of Environmental Protection, Office of Solid Waste, has reviewed the information submitted by Short Creek Landfill. Based upon this information, the WVDEP believes that this waste is excluded from regulation as hazardous waste under the Resource Conservation and Recovery Act. Consequently, a minor permit modification is granted for the disposal of this waste at Short Creek Landfill.

2. ☒ Quantity Approved: 32,000 Ton/Year

   ☐ This quantity approved is an increase of the amount allowed by the Minor Permit Modification: granted:

3. ☒ This amount may be received before: May 29, 2027

   ☐ The above date represents an extension of the time allow by the Minor Permit Modification: granted:

4. ☒ Approved for disposal:

   ☒ TPH (GRO + DRO + ORO) > 10,000 mg.kg: This waste must be aerated over an unused lined portion of the landfill until test results are obtained showing that TPH (GRO + DRO + ORO) is less than 10,000 mg/kg, TOVs are less than 100 ppm, and if

DRO is present at more than 100 mg/kg, until total PAH is less than 100 mg/kg, and then disposed of within 30 days of obtaining those test results.

☐ TPH (.....) < 10,000 mg/kg:

a. DRO > 100 mg/kg and/or TOVs > 100 ppm: This waste must be aerated over an unused lined portion of the landfill until test results are obtained showing that, as applicable, total PAH is less than 100 mg/kg and TOVs are less than 100 ppm, and then disposed of within 30 days of obtaining those test results.

b. DRO < 100 mg/kg and TOVs < 100 ppm: This waste must be disposed of within 30 days of receiving the waste or this minor permit modification, whichever is later.

5. ☐ Approved for use as daily cover or disposal:

☐ TPH (.....) > 5,000 mg/kg: This waste must be aerated over an unused lined portion of the landfill until test results are obtained showing that TPH (.....) is less than 5,000 mg/kg, TOVs are less than 100 ppm, and if DRO is present at more than 100 mg/kg, until total PAH is less than 100 mg/kg, and then used as daily cover or disposed of within 30 days of obtaining those test results.

☐ TPH (.....) < 5,000 mg/kg:

a. DRO > 100 mg/kg and/or TOVs > 100 ppm: This waste must be aerated over an unused lined portion of the landfill until test results are obtained showing that, as applicable, total PAH is less than 100 mg/kg and TOVs are less than 100 ppm, and then disposed of within 30 days of obtaining those test results.

b. DRO < 100 mg/kg and TOVs < 100 ppm: This waste must be used as daily cover or disposed of within 30 days of receiving the waste or this minor permit modification, whichever is later.

6. ☐ After a minimum of thirty days of aeration, this waste must be tested for and the analytical results submitted to this office for review before disposal.

7. ☒ Petroleum contaminated materials that are not used as daily cover shall be included in monthly tonnage calculations.

8. ☒ Petroleum contaminated materials (PCM) that are used as daily cover may be excluded from monthly tonnage calculations, provided that all of the following conditions are met:

a. Daily deposition of solid waste is confined to as small an area as practical in accordance with the Solid Waste Management Rule, 33 C.S.R. 1-4.6.a.1.A.

b. Calculations for the amount to be used as daily cover and exempted from the tonnage limits shall be based on an eight foot (8') vertical cell height for solid waste disposed of daily.

c. Under no circumstances, shall the amount of PCM used as daily cover and exempted from monthly tonnage calculations, exceed the rate of 0.14 tons per one (1) ton of solid waste.

d. Example: A facility that receives 200 tons per day of solid waste, including PCM that is suitable for use as daily cover, shall not exceed 28 tons per day for tonnage exemption.

Required formula for calculation:

0.14 x tons of solid waste per day = tons of cover material permitted per day.

9. ☒ The disposal or use as daily cover of this waste must take place during normal working hours, will not be exempt from assessment fees, and must be included in the monthly tonnage report.

10. ☒ Free liquids received by the landfill cannot be disposed of in the landfill. Free liquids and poorly contained liquids must be absorbed on solid material before being placed in the disposal cell. A Paint Filter Liquid Test (Method 9095) as described in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: (EPA Pub. No. SW-846), must be performed on each load of waste after solidification and results maintained on site at all times with the special waste permit for review by West Virginia Department of Environmental Protection (DEP_ personnel. A summary of this data must be submitted to the DEP every six (6) months from the issuance date of this permit, for the life of the permit.

11. ☒ Additional comments and/or conditions: In lieu of aeration, Short Creek Landfill shall excavate a pit in the active working disposal area. The contaminated material shall be placed in the pit and covered immediately upon disposal. Every year by the anniversary date of this Minor Permit Modification, Short Creek Landfill shall submit laboratory results for a sample representative of the waste, recently collected by AMG Resources Corp., and analyzed by EPA-approved methods for:TCLP VOC's, SVOC's, Metals, TPH-GRO, ORO, DRO, Percentage of Solids, PCBs, & PH

12. ☒ The landfill must maintain monthly storage capacity to accommodate the disposal of municipal solid waste as per the facility's Certificate of Necessity. This Permit in no way allows the landfill to guarantee space or accept waste from the waste generator if the guarantee or acceptance of the waste will be likely to create an excess in monthly tonnage.

13. ☒ If you have questions or need additional information, please contact Bassam Makar at (304) 926-0499, extension 43851 or Bassam.Y.Makar@wv.gov

Minor Permit Modification is Granted:

Jeremy W. Bandy

Jeremy W. Bandy
Director

May 30, 2025
Date

Civil & Environmental Consultants, Inc.

June 20, 2025

Mr. Yogesh Patel, P.E.
West Virginia Department of Environmental Protection
Engineer Chief
Division of Water and Waste Management
601 57th Street SE
Charleston, West Virginia 25304

Dear Mr. Patel:

Subject: Waiver Request to Continue Using Auto Shredder Residue as Alternative Daily Cover Material
Republic Services Short Creek Landfill
SWF-1034 / WV0109517
Wheeling, West Virginia
CEC Project 171-934

On behalf of Republic Services Short Creek Landfill (Short Creek), Civil & Environmental Consultants, Inc. (CEC) submits this request for a waiver to continue using Auto Shredder Residue (ASR) generated by AMG Resources Corporation (AMG) as Alternative Daily Cover Material (ADCM) at the landfill.

A recent minor permit modification (SWPU ID: 25-05-49, dated May 29, 2025) for disposal of the AMG ASR did not include approval to use the material as ADCM. Prior to this recent modification, Short Creek has been permitted to use ASR as ADCM and has done so successfully for many years.

Based on the site's experience to date, Republic Services believes the continued use of ASR as ADCM is a reasonable request for the following:

- Short Creek has successfully applied ASR as ADCM over the past approximately 20 years, and its use has become a well-established part of routine daily operations. Short Creek's working face operators have considerable experience delivering, spreading, and securing ASR in a manner that effectively covers waste and minimizes the potential for environmental impact.
- During this time the landfill has not received any complaints with respect to odors related to ASR and has not received a West Virginia Department of Environmental Protection (DEP) violation related to its use as ADCM.
- ASR used in this manner is environmentally beneficial. It reduces the need for Short Creek personnel to excavate, load, transport, and spread soil, which cuts down on emissions from

heavy construction equipment, and has substantially reduced the need for Short Creek to develop soil borrow sources, thus limiting earth disturbance.

- ASR is not contaminated soil; it possesses greater surface area and is absorbent, relative to soil. These characteristics allow ASR to absorb and sequester total petroleum hydrocarbons (TPH) better than soil.
- Surface water monitoring results indicate TPHs absorbed within the ASR remain absorbed and within the lined landfill and are not leached during precipitation events, as evidenced by the fact there has been no impact to surface water quality.
- There's been essentially no change over time in the chemistry of the ASR with respect to TPH or other parameters. Review of chemical analyses performed on the AMG ASR used as ADCM over the past several years shows chemical characteristics similar to ASR samples from recent (i.e., 2025) testing. Again, the ASR has been routinely used during this time period without environmental impact or nuisance complaints.

Republic believes the continued use of ASR as ADCM aligns with our shared goals of improving landfill efficiency, reducing environmental impact, and promoting sustainable waste management practices, and respectfully requests a waiver approval.

If you have any questions or comments, please call Mr. Shawn Meenihan – Republic Environmental Manager at (724) 601-3444 or me at (724) 327-5200.

Very truly yours,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Eric D. Chiado

Eric D. Chiado, P.E.
Vice President

EDC/jg

cc: Bassam Makar

L-171934.Jun20/P

WEST VIRGINIA ENVIRONMENTAL QUALITY BOARD
CHARLESTON, WEST VIRGINIA

REPUBLIC SERVICES/SHORT CREEK LANDFILL,

Appellant,

v. **Appeal No.** 25-07-EQB

DIRECTOR, DIVISION OF WATER AND WASTE MANAGEMENT,
DEPARTMENT OF ENVIRONMENTAL PROTECTION,

Appellee.

CERTIFICATE OF SERVICE

I, Samuel F, Hanna, do hereby certify that I, on this 26th day of June, 2025, served the attached Notice of Appeal to all parties in the foregoing Appeal, by U. S. Mail, postage prepaid, as follows:

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Charleston, WV 25304

WVDEP
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Samuel F. Hanna

Representative Sampling of Automobile Shredder Residue (ASR)
Using the DQO Process

Introduction

Automobile Shredder Residue (ASR) is an extremely heterogeneous waste consisting primarily of non-metallic waste materials that remain after the removal of metal scrap from mechanically shredded automobiles, household and commercial appliances, and other items. In Wisconsin, ASR is often used as Alternate Daily Cover (ADC) on subtitle D landfills.

Analytical data collected by the ASR generators shows that the ASR contains lead, cadmium, chromium, Polychlorinated Biphenyls (PCBs), and Polycyclic Aromatic Hydrocarbons (PAHs) that can be a concern to human health and the environment when these analytes are above a certain level. In addition lead, cadmium, and chromium are Resource Conservation and Recovery Act (RCRA) heavy metals and can cause the ASR to be characteristic hazardous waste when these heavy metals are over the regulatory limits establish under RCRA.

Step 1: State the Problem

Problem

The current methods used for the quarterly sampling of ASR may not be scientifically and legally defensible as the current method does not appear to collect a representative sample and the use of an ongoing rolling average of the last 5 sampling events that occur every several months creates inconsistency issues under RCRA, because there is no end point that concludes the hazardous waste determination required under s. 662.011 Wisconsin Administrative Code (WAC). Failure to properly characterize ASR could result in:

1. Non-hazardous ASR classified as a hazardous waste, which will result in significantly higher cost to the ASR generator for the treatment and disposal of ASR.
2. Hazardous waste ASR being used as ADC at a subtitle D landfill, which will result in landfill accepting for disposal a hazardous waste and potentially exposing landfill workers to hazardous wastes.
3. United States Environmental Protection Agency (U.S. EPA) asserting that the waste determinations made by ASR generators are not valid.
4. U.S. EPA finding Wisconsin’s hazardous waste program deficient for failure to act on the non-representative samples collected by ASR generators that are used for a hazardous waste determination under s. 662.011 WAC.

Conceptual Model of the Hazard

Automobile Shredder operations have several important features in common. Vehicles, appliance, and other objects are fed into a hammer mill, which then shreds these items into fist-sized pieces. Magnets and conveyor belts then separate the ferrous metals from the non-ferrous metal components. Next, using air cyclone or water separation, metallic components are segregated from the less dense fluff, allowing the ASR to be divided into piles of ferrous metals, non-ferrous metal, and fluff.

If the ASR contains RCRA heavy metals above the limits identified in s. NR 661.24 WAC and the ASR is improperly managed on-site and/or the ASR is disposed in a subtitle D landfill, then these heavy metals can leach into ground water and/or runoff in to streams and other surface water bodies, which could pose a hazard to human health and ecological receptors.

The planning team has determined that the ASR generator needs to collect a representative sample of the ASR in order to make a waste determination. This waste determination will be used to make a decision on how the ASR is to be managed at the site and whether the ASR is suitable for ADC. The cost of using ASR as ADC use is far less costly than managing the ASR under RCRA and/or TSCA. This difference well exceeds the cost of data collection and analysis.

ASR generators will have higher cost to implement the new ASR sampling methodology when compared to their current semi-annual or quarterly samplings. However, comparing the new ASR sampling methodology to the ongoing, current sampling, the new ASR sampling methodology will have a significantly lower cost in the end.

ASR Planning Team Members

Valerie Joosten, NR Regional Program Manager and Team Leader
Bob Grefe, Waste Management Engineer
Sue Fisher, Waste Management Engineer
Mike Ellenbecker, Hazardous Waste Program Coordinator

The ASR team will develop an ASR sampling recommendation and present it to the Waste and Materials Management (WMM) team who will make the final decision.

Identified Stake Holders

Wisconsin DNR, Subtitle D landfills using ASR as ADC, Sadoff Iron & Metal Company, B&B, and Alter Metal Recycling.

Resources, Constraints and Time Frame

This project is not expected to have any real cost outlay other than Department staff time to develop the ASR sampling methodology, which will then be implemented and paid for by the ASR generators.

- Expect to have a final plan to the WMM team by October 2015.
- Expect to have a draft of the final plan to the stakeholders by ____________.

Step 2: Identify the Goal of the Study

Primary Question

Does the ASR contain analytes that exceed the regulatory standard, thereby prohibiting its acceptance at a municipal solid waste landfill?

Determining Alternative Actions

1. Take no action (e.g., data is inconclusive, use old method).
2. Manage the ASR under RCRA and/or TSCA.
3. Use the ASR as ADC.
4. Direct disposal of ASR in a subtitle D landfill.

Decision Statement

Management of the ASR will be based on collecting a representative sample of the ASR, which will be used to make a waste determination that is scientifically and legally defensible.

Review past analytical results from ASR generators to determine if temporal variations in the generation of ASR exist that would change the ASR's regulatory status.

Step 3: Identify Information Inputs

Information Needed to Resolve the Decision Statement

Each ASR generator will need to collect at least 140 KG[1] (309 pounds) of ASR using MULTI INCREMENT® sampling methodology[2] (MIS) and sort the collected ASR into categories (e.g., plastic, rubber, textile, polyurethane, polystyrene, wood, metal, wire, glass and concrete, and objects less than 0.4 cm) in order to homogenize the ASR[3]. Each category will be weighed to determine the percent by weight the category contributes to the total amount of ASR collected.

Each category will then be subsampled three (3) times using MIS and subject to the following analytical test methods: Total RCRA Metals, Toxicity Characteristic Leaching Procedure (TCLP) RCRA Metals, PCBs, and PAHs. The final analytical value used for each analyte will be based on the accumulative percentages (by weight) of each of the categories. Instead of testing every quarter, the generator would test only when there is a process change, so the generator will need to have a system in place to identify when a process change occurs. Landfill special waste acceptance plans may require more frequent testing for periodic recharacterization of the material.

Source of Information to make Decision

The ASR analytical data will be used to determine how the ASR is to be managed.

Action Levels and Analytical Methods

Table 1: ASR Action levels and analytical methods

Group	Analyte	Limit for ADC Use[4]	Unit of Measurement	Laboratory Analytical Method	Limit Source
TCLP Metals	Arsenic	5.0	mg/l TCLP	EPA Method 1311	Table 2 in s. NR 661.24(2) WAC
	Barium	100.0	mg/l TCLP	EPA Method 1311	Table 2 in s. NR 661.24(2) WAC
	Cadmium	1.0	mg/l TCLP	EPA Method 1311	Table 2 in s. NR 661.24(2) WAC
	Chromium	5.0	mg/l TCLP	EPA Method 1311	Table 2 in s. NR 661.24(2) WAC
	Lead	5.0	mg/l TCLP	EPA Method 1311	Table 2 in s. NR 661.24(2) WAC
	Mercury	.2	mg/l TCLP	EPA Method 1311	Table 2 in s. NR 661.24(2) WAC
	Selenium	1.0	mg/l TCLP	EPA Method 1311	Table 2 in s. NR 661.24(2) WAC
	Silver	5.0	mg/l TCLP	EPA Method 1311	Table 2 in s. NR 661.24(2) WAC

Sampling Method

ASR generators will use MIS to collect ASR samples. Information on MIS can be found at http://www.envirostat.org/multiincrementdefinition.htm

Step 4: Define the Boundaries of the Study

Target Population

Probability sampling using the systematic sampling procedure will be used, so that every individual in the target population (ASR waste piles or ASR conveyor belt) has equal chance of being collected. This method guarantees that the selection process is completely randomized and without bias. Systematic sampling (grid or time) is suggested because it is easy to implement and there is no reason to believe that there is a hidden periodic trait within the target population.

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[1] Conclusion from J.L. Pineau et al., 2005. Representativeness of an automobile shredder residue sample for a verification analysis, Vandœuvre, France p. 17-18.

[2] MULTI INCREMENT® is a registered trademark of EnviroStat, Inc.

[3] Iron (Fe) has been known to temporarily stabilize (until oxidization occurs) certain heavy metal like lead. By separating out the different components of the ASR, it could result in a higher TCLP value when compared to the ASR components not being separated.

[4] The landfill's special waste acceptance plan or alternative daily cover approval may specify additional limits for acceptance or use as ADC.

ASR Waste Pile

If sampling from an ASR waste pile, the ASR waste pile needs to adequately represent the types of materials that are processed at the ASR generator. In order to ensure that that every individual in the target population has equal chance of being collected, the ASR waste pile should be 'flatten' to a depth of no more than 12 inches. Each sample point or increment will consist of the entire depth of the 'flatten' ASR. When sampling from the 'flatten' ASR waste pile, the ASR generator should collect at least 60 increments using a systematic grid sampling protocol. Another method to ensure that that every individual in the target population has equal chance of being collected is to move the ASR waste pile with a loader. During the move, samples are collected from the loader's bucket. Samples collected from the loader's bucket will need to be evenly collected throughout the ASR waste pile move until the sample mass is reached.   Ideally each increment collected should be approximately equal in volume and mass (estimated to be 5 pounds a scoop) until at least 309 pounds of ASR is collected.

Conveyer Belt

Sampling from the conveyer belt would eliminate double handling of the ASR when compared to sampling from an ASR waste pile. In addition, representative sampling is more easily achievable, because every part of the population from the conveyer belt is much easier to reach than every part of the population from an ASR waste pile. Sampling from the conveyer belt needs to be completed in a manner that adequately represents the types of materials that are processed at the ASR generator. This may require the ASR generator to collect the increments over a long period using a systematic time sampling protocol. For example. An ASR generator may need to collect 60 increments, twice a day, for a month in order to represent the types of materials that are processed at the ASR generator. Ideally each increment should be approximately equal in volume and mass (estimated to be 5 pounds a scoop) until at least 309 pounds of ASR is collected.

Table 2: Comparison of Sampling an ASR Waste Pile to the Conveyer Belt

	Waste Pile	**Conveyer Belt**
Recommended minimum number of increments to collect	60	60
Recommended minimum sample mass needed to collect	309 pounds	309 pounds
Recommended method used to collect the sample	Systematic grid	Systematic time
Effort needed to collection of samples	More: The ASR waste pile(s) will need to be 'taken apart' in order to access the entire population	Less
Time needed to collect samples	One or two days	Many days/months may be needed in order to represent the types of materials that are processed at the ASR generator
Special equipment required	Loader needed to take apart ASR waste piles.	None
Skill/knowledge needed to collected sample	Minimal once process is set up.	Minimal once process is set up.

Spatial and Temporal Boundaries

The ASR waste pile and the conveyor belt serves as a natural spatial boundary to the target population. The ASR waste pile is not subject to a change over the period of time that would result in the samples collected from the ASR waste pile no longer being representative of the ASR waste pile.

To expedite the decision making process the planning team has specified a deadline of 90 days from the end of sample collection to submittal of the final report containing the recommendation, sampling summary, and the supporting analytical data.

Practical Constraints

1. Sampler and laboratory need to follow MIS
2. Laboratory needs to follow the TCLP method exactly. This is especially important when collecting the ASR samples to be analyzed as failure to subsample the ASR correctly will likely skew the TCLP results.
3. Sampling conditions are safe for field staff.
4. Good sampling conditions (e.g., not raining, high winds, high heat/humidity, not snowing, not cold) so that MIS is not compromised.

Scale of Inference for Decision making

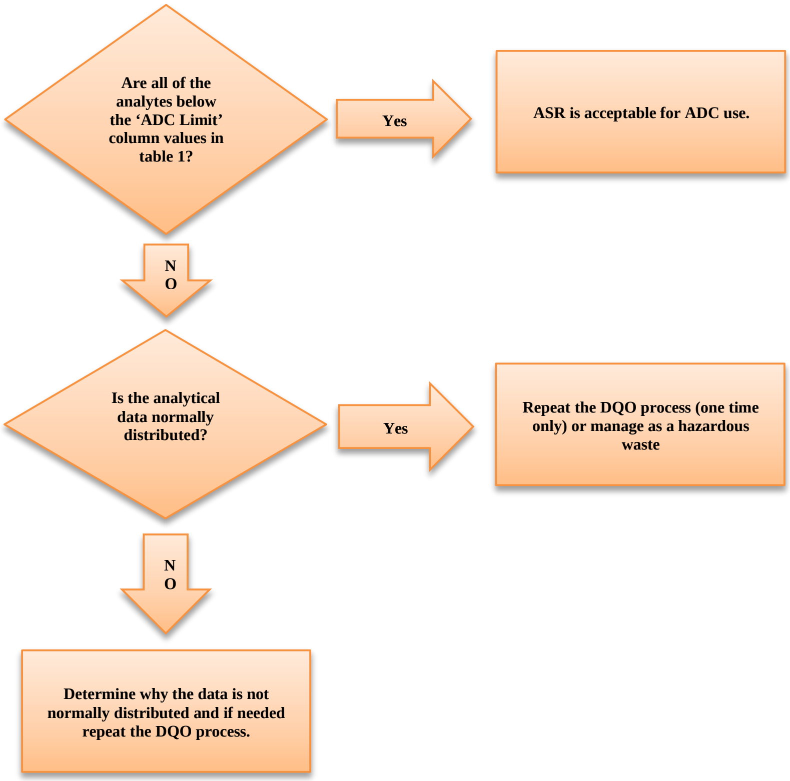
A decision unit corresponds to an ASR waste pile or an ASR conveyor belt.

Step 5: Develop a Decision Rule

Action Level

See table 1 for the action levels used to determine if the ASR is acceptable for use as ADC.

Theoretical Decision Rule



Step 6: Specify Tolerable Limits on Decision Errors

Baseline and Alternative Conditions

The planning team determined that the decision on the management of the ASR must be made with safeguarding public health and environment. Following EPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods SW 846, the collected data from a given ASR generator must demonstrate that the ASR is, in fact, acceptable for ADC use. To meet this requirement, the baseline condition has been established as "ASR is not acceptable for ADC use"[5] (i.e., is at or above the Table 1 action levels), while the alternative condition is “ASR is acceptable for ADC use” (i.e., is below the Table 1 action levels). The statistical hypotheses are then:

- Null hypothesis (H_o): true mean of the analytes are at or above the Table 1 action levels.
- Alternative hypothesis (H_a): true mean of the analytes are below the Table 1 action levels.

Unless there is conclusive information from the collected data to reject the H_o, (the baseline condition) for the H_a, (the alternative condition), we therefore assume that the baseline condition is true.

Impact of Decision Errors

A “false acceptance decision error” corresponds to deciding that the ASR is not acceptable for ADC use (i.e., H_o is not rejected) when in reality the ASR is acceptable for ADC use (i.e., H_o is false). In contrast, a “false rejection decision error” corresponds to deciding that the ASR is acceptable for ADC use (i.e., Ho is rejected in favor of H_a) when in reality the ASR is not acceptable for ADC use (i.e., H_o is true). The planning team identified the following consequences for each decision error:

1. False acceptance decision error:
   The primary consequence of making a false acceptance decision error is the considerable expense to the ASR generator, as the ASR was not used as ADC, when in fact the ASR is acceptable to use as ADC.

2. False rejection decision error:
   The consequences of making a false rejection decision error is the ASR generator would use ASR as ADC, possibly endangering human health and the environment. In this situation, the ASR generator could be held liable for future damages and environmental cleanup costs. Additionally, making a false rejection decision error would compromise the reputation of the ASR generator, jeopardizing its future profitability.

Since the risk to human health outweighs the consequences using ASR as ADC, the planning team has concluded that when the Table 1 action levels of the ASR is near the action level, making a false rejection decision error would lead to more severe consequences than making a false acceptance decision error.

Limits on Decision Errors

The potential negative consequence for making a false rejection decision error is high in this instance (e.g., endangering public health and environment, bad publicity, civil suit by landfill, regulatory penalties), therefor a high level of confidence (90% certainty) in the data is appropriate. Applying a 90% confidence level will reduce the chances of the ASR generator of being noncompliant with the table 1 values.

For example, a 90% confidence level means that the ASR generator is 90% certain (10% uncertain) that any additional sample will also be below the action level. To apply a specific confidence level to the data, the ASR generator needs to determine the confidence limits statistically. Confidence limits are the upper and lower limits that your data need to fall within to meet a specific confidence level. Most action levels will be based on regulatory standards that are not to be exceeded (or equaled), so normally the upper confidence limit is used.

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[5] Using this as the baseline condition is not stating that the ASR is a hazardous waste; however, it is stating that analytical information is needed in order to determine if the ASR is suitable for use as ADC.

Calculating the 90% Upper Confidence Limit (UCL) of the Mean

Assume we received the following set of analytical data for the sample discussed above:
ASR TCLP Results for Lead
Sample A: 4.1 mg/l
Sample B: 4.3 mg/l
Sample C: 3.9 mg/l

Since the data are normally distributed*, the upper bound of the 90% confidence level may be calculated in the following manner:

STEP 1: Calculate the sample mean:
Where, A, B, and C are the individual sample results and n is the number of sample results.
Sample Mean = (A + B + C)/n
Sample Mean = (4.1 + 4.3 + 3.9)/ 3 = **4.1**

STEP 2: Compute the sample standard deviation*:
Standard Deviation = **.20**

STEP 3: Use the Critical Values of Student's t Distribution table to look up the value of t*:
t Value = 1.886

STEP 4: Calculate the 90% Upper Confidence Limit:**
90% UCL = $Sample\ Mean + (T\ Value \times Standard\ Deviation/\sqrt{n})$
90% UCL = $4.1 + (1.886 \times .20/\sqrt{3})$ = **4.3**
The upper bound 90% confidence limit of the analytical results (4.3 ppm) was below the action limit of 5.0 mg/l. The data sufficiently demonstrates that the waste is acceptable for the particular management method you have chosen.

Note(s):
*For simplicity in the example above, we have used sample results that are normally distributed and have not presented the full calculations for determining the standard deviation calculate or given an explanation of how to look up the "t" value using Critical Values of Student's t Distribution table. If your sample results **are not** normally distributed, you may need to apply different statistical techniques. If you do not know how to calculate the standard deviation or use the t- table, please see the references listed at the end of the section for more information.

** *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*, OSWER 9285.6-10, U.S. Environmental Protection Agency, December 2002.

Step 7: Optimize the Design for Obtaining Data

Review outputs from steps 1 - 6

The planning team reviewed this DQO and the past data collected by ASR generators.

Sampling Design

The planning team determined that using MIS was the best sampling methodology to use to collect a representative sample of ASR in order to determine if the ASR is acceptable for use as ADC. The sampling plan is as follows:

1. Each ASR generator is to retain a contractor that is competent in MIS
2. ASR generator develops a site-specific sampling plan using the DQO process.

3. Collect at least 140 kg of ASR using MIS.
4. Sort the collected ASR into the following ten categories:
    a. plastic,
    b. rubber,
    c. textile,
    d. polyurethane,
    e. polystyrene,
    f. wood,
    g. metal,
    h. wire,
    i. glass and concrete,
    j. objects less than 0.4 cm

   Sorting into the above categories is needed in order to better represent the ASR.
5. Weight each category to determine the percent by weight the category contributes to the total amount of ASR collected. The final analytical value used for each analyte will be based on the accumulative percentages (by weight) of each of the categories. For example, 10 mg/l of lead was detected in the ‘metal’ category. Lead was not detected in any of the other categories. The metal category contributes 20% by weight to the total weight of the ASR collected. The final lead value is 20% of 10 mg/l or 2 mg/l.
6. Subsample each category using MIS. Three samples from each category (30 in total) will need to be collected in order to determine the 90% Upper Confidence Limit (UCL) of the Mean.
    a. When a category contains materials that are an obvious characteristic hazardous waste (e.g., lead wheel weights, lead battery clamps, mercury switches) collect another sample of the same category that does not contain these materials and analysis this catergory. The rational for this is that these materials should have been removed from the ASR and that a process change should easily be able to intercept these materials before they enter the ASR waste stream.
7. Wisconsin certified laboratory must use MIS when collecting the subsamples that are to be analyzed for each analyte listed in Table 1.
8. Submit the 30 subsamples to for the following analytical methods:
    a. Total Metal using EPA Method 3050B
    b. TCLP Metals using EPA Method 1311
    c. PCBs using EPA Method 8082B
    d. PAHs using EPA Method 8310
9. Submit a report to the Department documenting and summarizing the sampling and data. The report should contain at a minimum the following information:
    a. A narrative of the ASR operation including amount generated in a month, past and current practices of the management of the ASR, items that make up the ASR.
    b. The sampling plan used to collect the ASR
    c. A narrative of any temporal or spatial variations of the ASR
    d. A narrative on how the decision unit was selected and how the decision unit is a representation of all of the ASR generated by the facility.
    e. Photos of the ASR operation, ASR sampling event, and the sorted ASR categories.
    f. The analytical data from the lab
    g. The weights of subsamples for each of the categories
    h. The subsampling plan used in the laboratory
    i. A table summarizing the laboratory analytical data.
    j. Conclusions

Estimated Cost

Table 3: Estimated cost to implement

Unit Description	Number of Units	Unit Type	Unit Cost*	Total Unit Cost
Total Metals	30	Each	$150	$4,500
TCLP	30	Each	$185	$5,550

PCBs	30	Each	$90	$2,700
PAHs	30	Each	$190	$5,700
Sampling jars, sorting containers, PPE, plastic sheets, etc.	1	Each	$1,000	$1,000
Field sampling	20	Hours	$70	$1,400
Sorting and sub sampling	20	Hours	$70	$1,400
Report	20	Hours	$70	$1,400
				$23,650
10% Contingency				**$26,015**

*Note: There may be additional cost savings based on the volume of samples submitted to the laboratory

Key Assumptions Supporting the Selected Design.

1. The sampling plan assumes that the sample results are normally distributed. This assumption will be evaluated once the measurements are obtained. If this assumption is not valid, then the planning team will recommend that additional samples be taken or use of a different statistical technique.
2. ASR generator has a system in place to determine if changes to ASR composition are taking place

Resources

J.L. Pineau et al., 2005. Representativeness of an automobile shredder residue sample for a verification analysis, Vandœuvre, France

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United States
Environmental Protection
Agency

Office of Prevention, Pesticides
and Toxic Substances
Washington, DC 20460

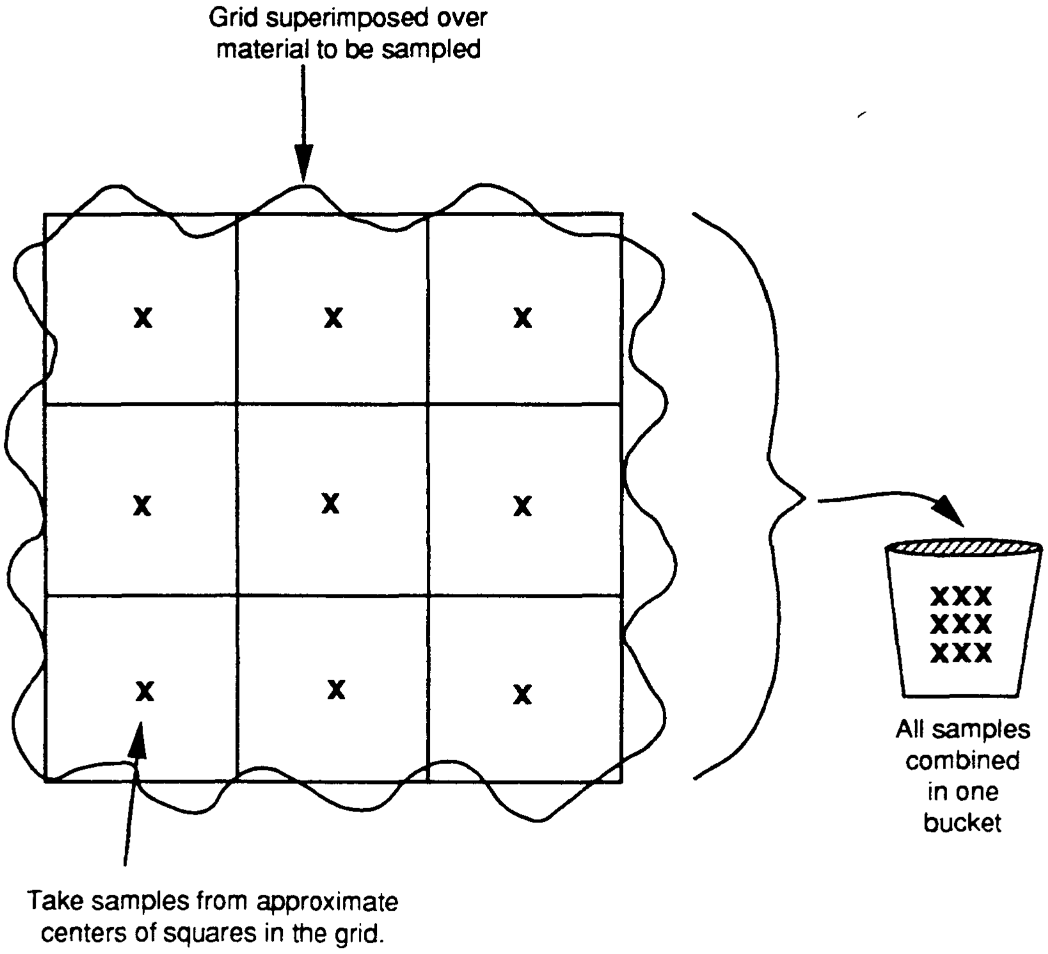
EPA 747-R-93-009
August 1993

Office of Prevention, Pesticides, and Toxic Substances

EPA

SAMPLING GUIDANCE FOR SCRAP METAL SHREDDERS

Field Manual



SAMPLING GUIDANCE FOR SCRAP METAL SHREDDERS

Field Manual

August 1993

United States Environmental Protection Agency
Office of Prevention, Pesticides
and Toxic Substances
Washington, DC 20460

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This document has been reviewed and approved for publication by the Office of Pollution Prevention and Toxics, U.S. Environmental Protection Agency. The use of trade names or commercial products does not constitute Agency endorsement or recommendation for use.

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Acknowledgments

The Office of Pollution Prevention and Toxics wishes to thank everyone involved with this project at Westat and at the Evironmental Protection Agency, as well as others that have contributed to the document.

In particular, we acknowledge the technical help of John Rogers and William Devlin of Westat in preparing this document. Mary Lou Pieranunzi, Angelia Murphy, Maida Montes and Anna Page also helped to prepare and proof-read the manuscript.

We are grateful to the many reviewers in the Office of Pollution Prevention and Toxics and in other branches of the Environmental Protection Agency for reading the document. In particular, we thank Brad Schultz and Dan Reinhart of the Exposure Evaluation Division.

We owe special thanks to Mitchell D. Erickson of Argonne National Laboratory, David N. Speis of Environmental Testing and Certification Corporation, and Herschel Cutler of the Institute of Scrap Recycling Industries for reviewing this document and contributing many useful comments about it. Their review does not constitute approval.

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1. INTRODUCTION

Purpose of this Document. The purpose of this document is to provide basic instructions for collecting and statistically analyzing samples of materials that are produced as a result of shredding automobiles, refrigerators, washing machines, and other metal objects. Shredders constitute an important component of this country's environmental management program, annually recycling 6-9 million cars, 19 million appliances, and 10 million tons of scrap metal. Unfortunately, the by-products of these recycling operations may, in some cases, contain significant concentrations of polychlorinated biphenyl's (PCBs) or other toxic substances, notably lead and cadmium. As a result, communities, environmental agencies, and shredder operators have expressed concern over the possibility of contamination in waste products generated at shredder sites and have indicated a need for guidance in assessing the presence of toxic substances in these materials.

Previous Studies. Several States have done exploratory studies of shredder sites. Analysis of approximately 200 samples of waste materials collected at shredder sites have revealed concentrations of PCBs ranging from 0 to 1,242 parts per million (ppm).

Based on concerns raised by these studies, the U.S. Environmental Protection Agency (USEPA) has gathered samples of various waste materials at seven shredder sites distributed across the United States.[1] In this study, analysis of samples of PCBs revealed concentrations ranging as high as 870 ppm. The same study found concentrations of lead and cadmium ranging as high as 43,000 ppm and 200 ppm, respectively. Information from these prior studies, particularly the one done by the USEPA, has been used in developing the sampling methods discussed in this document.

Shredder Output Streams. Shredders are very large machines that convert autos, truck bodies and other light gauge metal objects into fist size or smaller pieces of scrap metal.[2] A typical shredder operation is depicted schematically in Figure 1. The actual "shredding"

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[1] *PCB, Lead, and Cadmium Levels in Shredder Waste Materials: A Pilot Study.* USEPA, Office of Toxic Substances. EPA 560/5-90-008B. 1991.

[2] The technical background for this section is based on material taken from *PCB, Lead, and Cadmium Levels in Shredder Waste Materials: A Pilot Study*, ibid.; on Chapters 1 and 2 of *Analytical Chemistry of PCBs*, by Mitchell D. Erickson, Butterworth Publishers, 1986; and on conversations with shredder operators and environmental consultants specializing in scrap metal recycling.

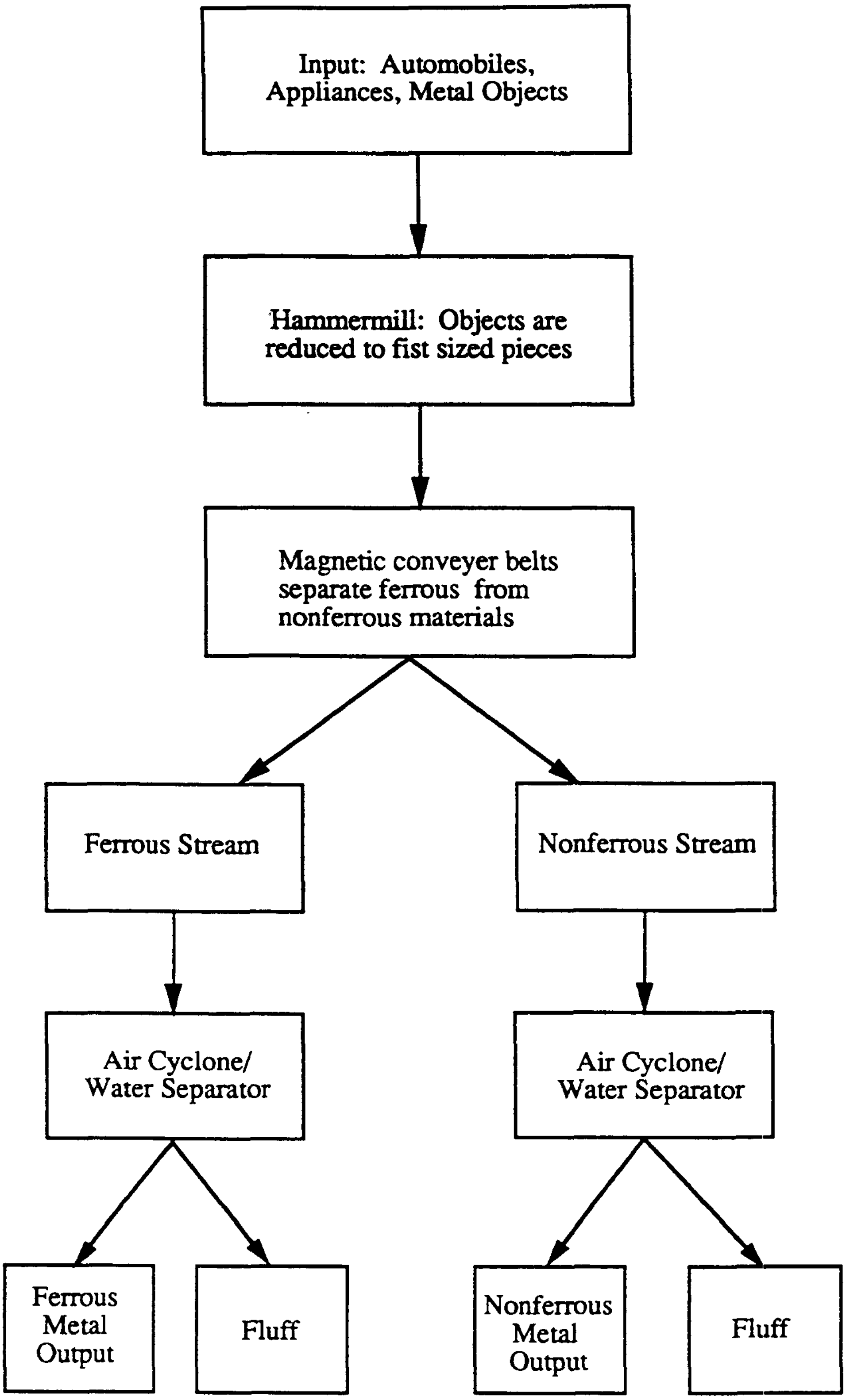

Figure 1. Schematic illustration of shredder process

is accomplished by a large hammer mill, after which the resulting output is sorted into three main output streams:

- Ferrous metals,
- Nonferrous metals, and
- Fluff.

Fluff is extremely heterogeneous. While it consists largely of plastic and foam, it may also contain pieces of metal, rubber, fabric, wire, and other materials. In general, it has a fibrous, "fluffy" appearance, at least when viewed from a distance. The initial separation into ferrous and nonferrous materials is carried out using magnetic devices. After this step, metal and fluff are separated using either air cyclone or water separation processes. In addition, nonferrous metals are often subjected to some hand-sorting as well. Both ferrous and nonferrous metals are recycled, while fluff is typically deposited in landfills.

It should be noted that this is a description of a "typical" shredder, but there are many types of shredders and the instructions in this document may have to be adapted for special circumstances at a given location.

How PCBs Enter Output Streams. PCBs enter output streams when materials containing PCB-bearing fluids are shredded. PCB-bearing fluids have been used in the construction of capacitors, transformers, electric motors, air conditioners, and hydraulic devices. PCBs have also been used as additives in pesticides, paints, sealants, and plastics.

The materials processed at shredder sites may be roughly categorized as follows:

- Motor vehicles, including passenger cars, light trucks, vans and small school buses: In such vehicles, PCBs may be found in paint, hydraulic fluids, oil capacitors, plastic materials, and in oily dust accumulated from roads.

- Appliances, including refrigerators, washers, dryers, dishwashers, freezers, ranges, air-conditioners, microwaves, and hot water heaters: These materials are generally called "white goods." In white goods, PCBs may be found in capacitors and electric motors.

- Other materials, such as scrap metals, or industrial or office equipment: PCBs might be found in oil-filled capacitors, plastics, paints, and adhesives.

When objects containing PCB-bearing fluids are shredded, the fluids are dispersed and may be absorbed by the fluff, or the fluids may coat metal and plastic objects. Similarly, when plastics or painted objects are shredded, PCBs in particulate form may enter the fluff output stream. In any case, the concentration of PCBs in (or on) materials produced at shredder sites may pose an unreasonable risk to health or the environment.

PCBs have been regulated by the Toxic Substances Control Act (TSCA) since 1976. According to these regulations, materials that contain PCBs in a concentration of 50 ppm or more must be disposed of in a chemical waste landfill, boiler or incinerator approved under TSCA. EPA has determined that fluff is regulated under TSCA, 40 C.F.R, Part 761. The U.S. Shredding Industry produces approximately three million tons of fluff a year. If widespread contamination were found and the materials were deposited in TSCA landfills, the demand for these landfills could exceed their capacity due to the volume of fluff.

Where to Look for PCBs and Other Toxic Substances. Very little is known about the volume and distribution of PCBs at shredder sites. It is generally suspected that PCBs are much more likely to enter output streams when processing white goods than motor vehicles because of the higher prevalence of electric motors in the former. Because of this, many operators refuse to process white goods, while others accept them only if the motors have been removed. Those operators that do process white goods typically "mix" them with motor vehicles, usually at a rate of about 10% or less white goods (by weight).

When PCBs are present at a given site, it is generally expected that they would be found in fluff because of its absorbent nature. While metal output may be coated with PCB-bearing fluids, it seems unlikely that the coating would contain enough PCBs to constitute a health hazard. PCBs may be present in the soil at shredder sites, particularly in locations where fluff accumulates or is moved for storage. However, it must be stressed that very little is known about levels of PCBs at shredder sites and the possible contamination of materials produced by shredders.

Even less is known about other toxic substances that may be present at shredder sites. Lead and cadmium may enter output streams from paint and metal plating on component parts in motor vehicles. Unlike PCBs, lead and cadmium are not typically suspended in fluids, but they might adhere to particles of fluff as materials are shredded.

Sampling Objectives. There are several possible objectives in sampling for PCBs. At the time of this writing, no one knows very much about the presence of PCBs at shredder sites. Large concentrations of PCBs have been identified in some samples that have been collected; some of these findings have been questioned, based on data collection procedures and/or analytical methods. Thus, agencies may wish to collect data at shredder sites in order to study the situation in their locality. In such studies, the objective is simply to gather data and make a preliminary assessment of possible contamination, as measured by the overall concentration of PCBs, without any preconceived ideas about whether such contamination exists.

Another objective is to monitor the output of one or more shredder sites. In this situation, the monitoring agency – which may be the shredder operator or an outside agency – develops a program of regular sampling and analysis of materials to assure that shredder output meets specified standards.

In the event that a shredder site or output from a site is established as being contaminated with PCBs – if large piles of stored fluff or the soil around the site are known to contain high concentrations of PCBs, for example – then it may become necessary for the site to undergo some form of clean-up or change in operating procedures. Thus, a third objective of sampling might be to collect data to verify that a site is free of PCBs.

The sampling procedures described in this document are intended to produce representative samples of fluff that will give reasonably accurate estimates of the overall concentration of PCBs in the material being sampled. The sampling methods are suitable for any of the objectives described above. The document primarily addresses analytical methods for exploratory studies; an appendix discusses analytical methods for monitoring and clean-up verification.

Contents of This Document. The document consists of three main parts. In Chapter 2, we will discuss procedures for selecting samples of fluff and other media at shredder sites. Next, in Chapter 3, we will discuss subsampling and other issues in laboratory testing. Finally, in Chapter 4, we will discuss statistical procedures for deriving conclusions after the data have been analyzed at the laboratory. The methods discussed in Chapter 4 are intended for exploratory studies undertaken to assess the extent of PCB contamination, if any, at one or more shredder sites. Analytical methods for regulatory procedures are discussed in an appendix.

This document is intended for users of all backgrounds and no special statistical knowledge is required. The statistical background and technical justification for the material presented here is given in a companion volume.[1]

Cautions about Using This Document. This document consists of directions for collecting and analyzing samples of materials at shredder sites. The sampling plans, estimated sample size requirements, and the accuracy of statistical tests that are discussed in this document are based on data from samples collected at seven different shredder sites located throughout the United States. Although it is not likely, the data that you encounter at your shredder (or the site you are investigating) may differ substantially from the data used to develop the guidelines in this document. If this occurs, the sample sizes shown in tables in this document may yield results that are somewhat more or less precise than you would expect based on the parameters discussed in Section 4 and in the appendix.

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[1] *Sampling Guidance for Scrap Metal Shredders: Technical Background.* USEPA, Office of Pollution Prevention and Toxics. EPA/560/5-91-002.

2. SAMPLING PROCEDURES

2.1 Basic Sampling Guidelines

Overview. The purpose of the field sampling procedures described in this section is to estimate the overall concentration of PCBs, rather than to identify "hot spots" with high concentrations. Thus the sampling methods described here are intended to produce representative samples of fluff, since this material is generally considered to be the most likely to contain PCBs, if they are present at all.

Fluff is often stored in piles on the shredder site before being shipped to a landfill for disposal. We will differentiate between *stored fluff*, which is stored in piles at the shredder site, and *fresh fluff*, which is produced at the site while sampling is being done. In particular, we will describe different sampling procedures for stored and fresh fluff. The former may consist of very large piles which are difficult to access, while the latter is being continuously produced and is generally easier to sample.

In collecting samples, care should be taken to minimize the disruption of the normal operations of the shredder. This is important not only from the standpoint of maintaining good relations with the shredder operator, but also because the samples collected should, to the greatest extent possible, reflect the normal output of the shredder. If shredding procedures are altered in order to collect samples, the data collected may not reflect the usual PCB content (if any) of the shredder output streams.

How Large Should Samples Be? The materials present in fluff are very heterogeneous, and samples must be relatively large in volume to get a good cross-section of the types of materials present. In most cases, we suggest taking individual samples of about one gallon in size. Many of the sampling procedures we recommend require combining several samples of which each is one-half to one gallon in size. In any case, we recommend that the total volume of fluff collected at a site be at least five gallons.[1]

Duration of the Sampling Period. When sampling from the stream of fresh fluff as it is being produced, the duration of the sampling period is an important consideration. Samples

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[1] This recommendation is based on techniques for sampling heterogeneous materials presented in a seminar titled "Sampling Methodologies for Monitoring the Environment" by Pierre Gy and Francis Pitard Sampling Consultants.

may be collected only once during a visit, once each half-hour for several hours, or once each half-hour for an entire day. The longer the duration of the sampling period, the greater the likelihood of obtaining a representative sample of shredder output, since it is more likely that the materials shredded will be representative over a longer period. It is difficult to give fixed guidelines on how long to collect samples, but, in general, we suggest collecting samples of fresh shredder output each half-hour for a period of at least eight hours, or one working day. In any case, the general operating procedures followed at the shredder should be considered in deciding how long to make the sampling period and how frequently to collect samples. For example, if an operator runs white goods in the morning and automobiles in the afternoon, samples should be taken of each.

When different types of materials are recycled, the PCB content of the samples may vary considerably. Thus, regardless of the duration of the sampling period and the number of samples collected, the results of one day's sampling cannot be extrapolated to any other day unless the materials that are recycled on the two days are similar. Because of the variability in the materials shredded, high or low concentrations of PCBs may be found at one visit but not on a subsequent visit. Because of this fact, it is important that the samples collected at a site are as representative as possible of the usual activities of the shredding operation.

Collecting Representative Samples. The basic technique that we recommend for collecting samples requires two steps. First, a square, two-dimensional grid is superimposed over the material that is to be sampled, as shown in Figure 2. Stretching strings across the material is an efficient way of constructing the grid; the cells should be approximately equal in area. Next, samples should be taken from each cell in the grid and combined. This type of sampling is called *grid sampling*. It may be applied in sampling either fresh or stored fluff. The purpose of grid sampling is to obtain a sample that is spread throughout the material that is being sampled. Larger grids (e.g., four squares on each side) may be used, but a three-by-three grid is generally sufficient for this purpose.

When sampling material that is spread out in a grid, it is important to dig down into the material *to the bottom*. Finer particles will settle down and samples that are simply grabbed off the top will not be representative.

In order to collect more than one grid sample, use *replicated grid sampling*. Using this procedure, multiple samples are taken from each cell and combined in separate buckets, as illustrated in Figure 3. Each bucket is analyzed as an independent sample of material.

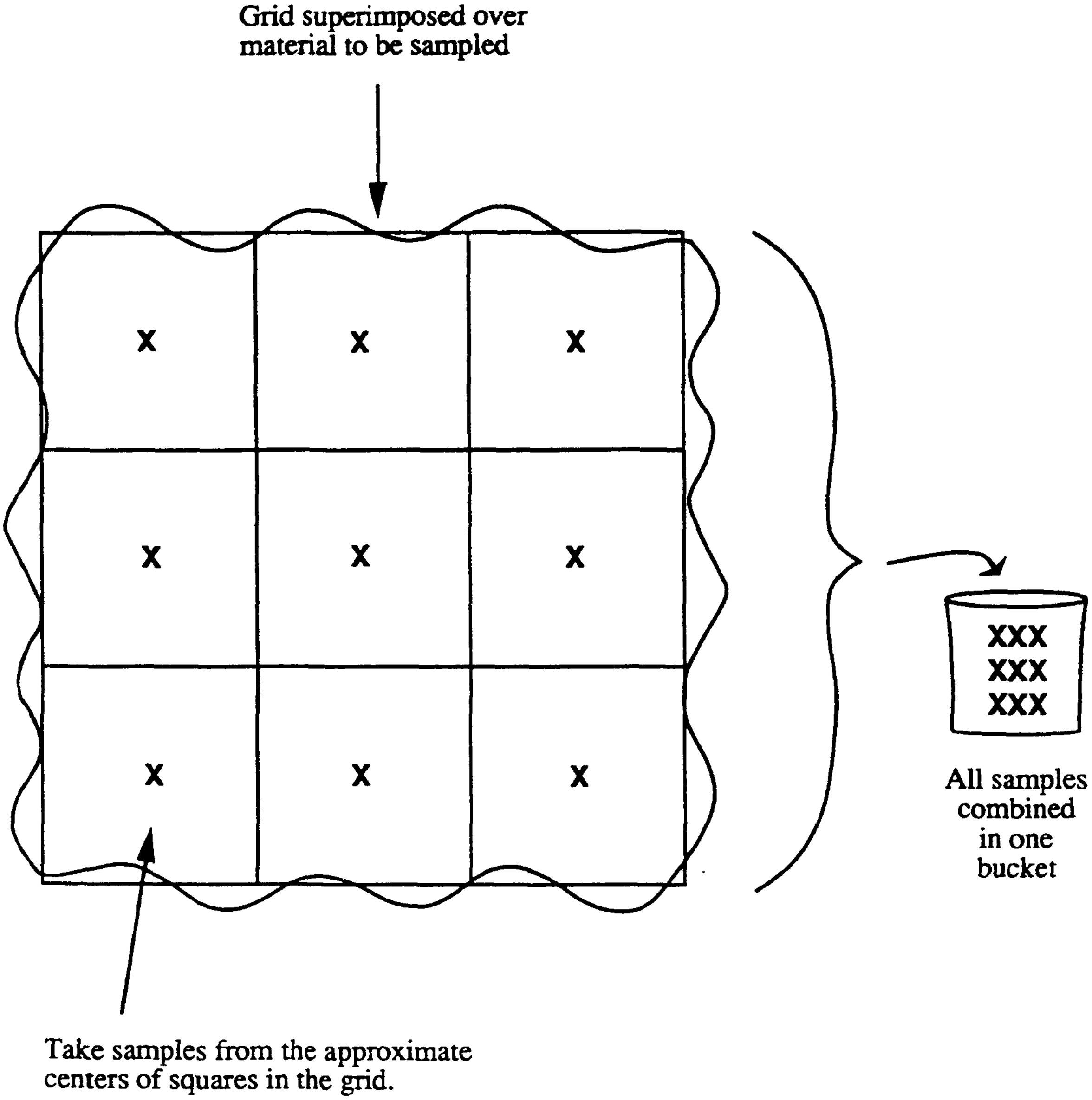


Figure 2. Illustration of grid sampling

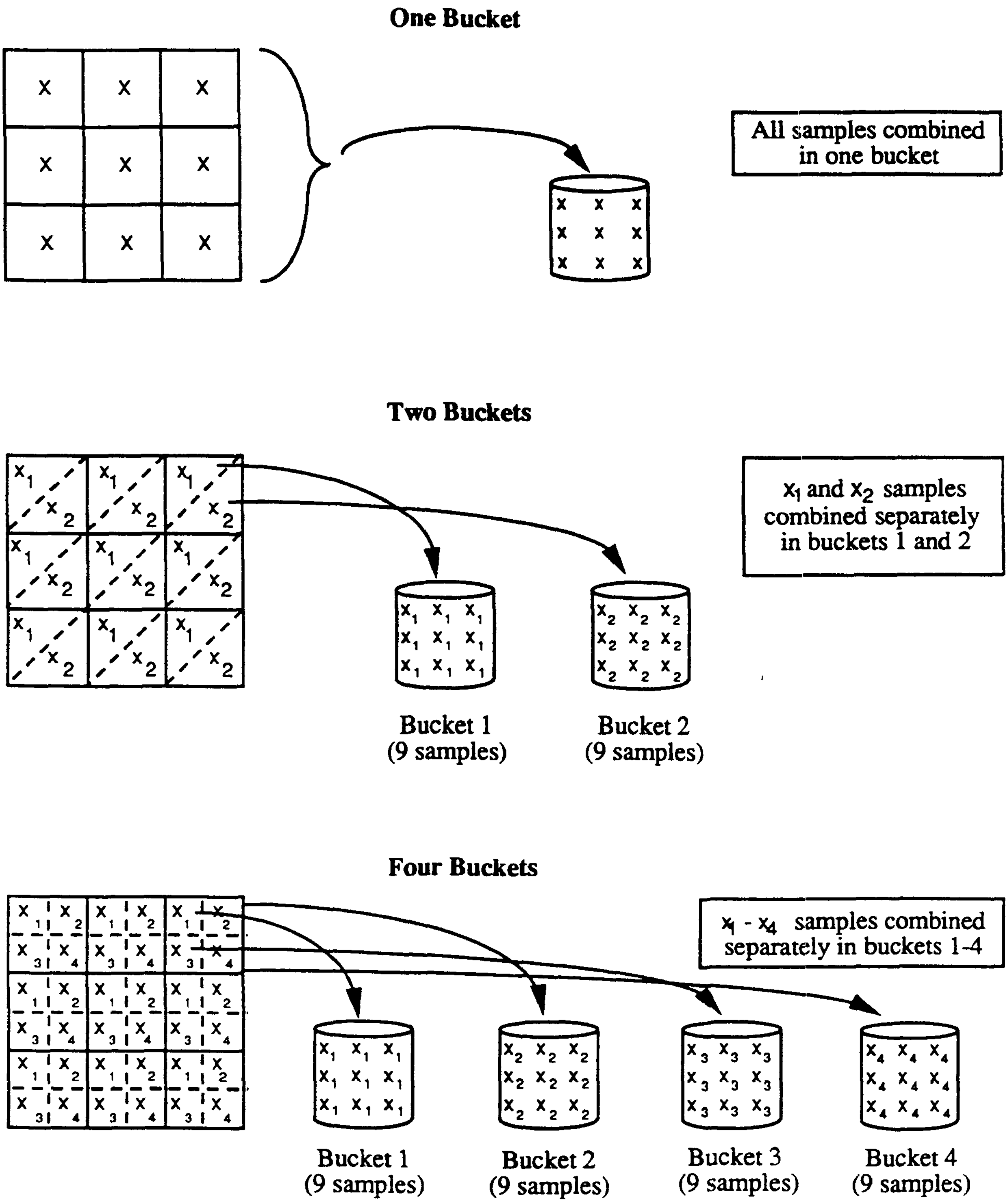


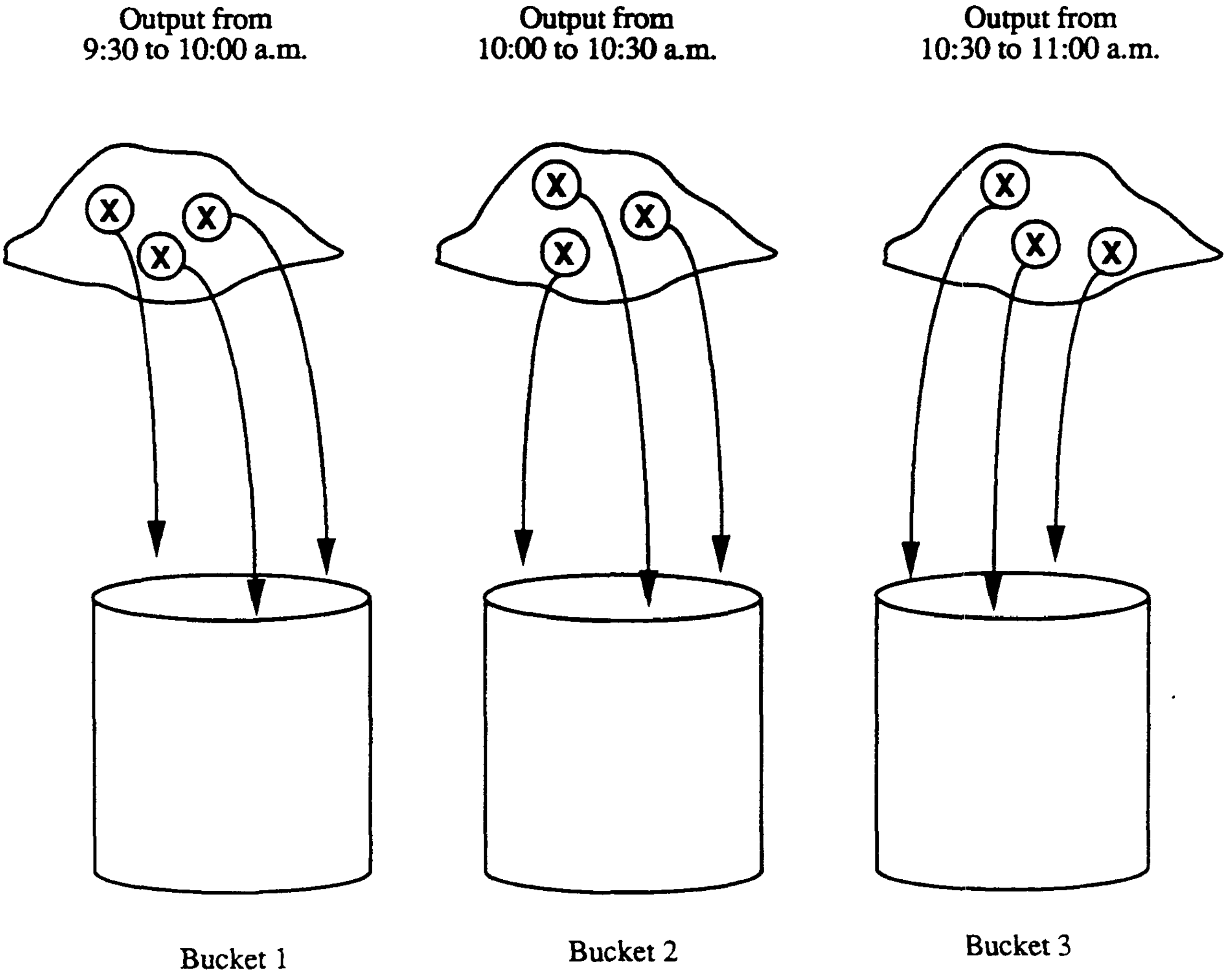
Figure 3. Replicated grid sampling

In some cases, grid sampling is not a practical option. For example, when sampling from large piles of fluff, it will be necessary to collect samples from various points in the pile without formally creating a grid. Detailed descriptions of how to sample stored fluff will be discussed below.

Sampling Over Time. When samples are collected from freshly produced fluff, samples must be collected at different times; for example, sampling might be done each half-hour over a 4- or 8-hour period. Figure 4 illustrates the basic technique for sampling over time. Here a separate grid sample is taken at each point in time, with each time period represented by a different bucket. Each bucket may consist of 1 gallon or more, but only one bucket per time period should be collected. If three samples are required, then samples should be collected at three different time periods (e.g., every 2 hours for a 6-hour period). If more samples are required, then either more time periods must be sampled (e.g., every hour for a 6-hour period) or samples must be collected for a longer duration (e.g., every 2 hours for a 12-hour period).

How Many Samples Should Be Collected? The number of samples that need to be collected depends on the accuracy required. As we will see in more detail later, about 10-20 samples should be sufficient for most purposes. For example, in sampling over time, 16 samples could be taken at half-hour intervals over the course of an 8-hour work day. These samples can be combined, using the technique of *compositing* which will be discussed later in Section 3.2, to reduce laboratory costs. Of course, fewer samples can be taken but at the risk of greater error. In Section 4, we will discuss the trade-offs between sample sizes and the reliability of conclusions.

What Equipment Should be Used? Because of the size and heterogeneity of materials that are produced at shredder sites, conventional core-sampling tools are usually of little use. Front-end loaders and backhoes may be useful for transporting and arranging materials, particularly if large amounts of fluff are involved. Similarly, trowels, rakes and shovels may be useful for smaller amounts of fluff. Because of the difficulty in manipulating fluff, it may be necessary to pick it up by hand and place "grab samples" manually in gallon containers. If available, a rotating gravity tumbler drum (RGTD) may be useful for mixing samples.



Samples Composited into Three Buckets

Figure 4: Sampling over time

Cleaning Equipment and Handling Samples. Whatever equipment is used, it must be clean in order to avoid contaminating the samples that are collected. Furthermore, equipment should be cleaned regularly, preferably after each sample is taken. To clean shovels, hoes, buckets, containers, and other equipment, soak them in dilute (20%) nitric acid and then rinse them three times, first with deionized water, then acetone, and finally hexane. Alternatively, steam cleaning can be used; if the steam condensate is free of PCBs, it can be disposed of easily. By comparison, disposal of solvents is always expensive.

If equipment is not cleaned, samples can become cross-contaminated. Cross-contamination occurs when PCBs from a sample that *is* contaminated are transmitted to a second sample which was *not previously* contaminated. This problem can occur when materials are not handled carefully and one sample leaks into another, or when equipment is not cleaned and a residue of PCBs builds up and is transmitted to multiple samples.

Besides keeping equipment clean, it is important to handle samples carefully. All samples should be clearly labelled, indicating the time, date and location. Samples should be stored in clean, sturdy containers. If samples are handled manually, gloves should be changed after collecting each sample.

Clearly, the cleaning of equipment can be cumbersome; moreover, it will be impractical in most circumstances to clean large equipment, such as backhoes. However, small equipment and containers should be cleaned as often as possible. While the risk may be small, it is in the best interests of both the shredder and environmental agencies that samples be as free as possible from cross-contamination. Cross-contamination can lead to erroneous conclusions about the level of toxic substances in the media. For example, stored fluff may be contaminated by fresh output, leading to the erroneous belief that the stored material may not be deposited in a sanitary landfill. Cross-contamination is especially serious when it occurs with samples from different sites, since questions of liability may be involved.

2.2 Sampling Fluff

General Guidelines. As described earlier, fluff is generated as a waste product which is separated from recyclable metals after the shredding operation. First, ferrous and nonferrous materials are separated using magnetic devices, and then fluff is separated from the metals either by using cyclone blowers or by washing with water, most commonly the former.

Fluff may either pile up below the cyclone separator or it may be removed to storage piles using conveyor belts.

There are generally three sources of fluff at a shredder site. First, fresh fluff is continuously being produced during the shredder operation. Second, there may be piles of stored fluff, although most shredder operators regularly ship fluff to avoid wasting storage space. Third, some fluff, which we will call *spillover*, is likely to have piled up around conveyor belts and other equipment. Although the basic sampling procedures are similar, we will give directions for sampling each form of fluff separately.

Fresh Fluff: Front-End Loader Assisted. We will describe two methods for sampling fresh fluff, the first of which involves the use of a front-end loader. This method is preferred for reasons of safety, sampling consistency, and minimal facility interruption.

Briefly, the front-end loader method involves (1) collecting the fluff in the front-end loader bucket as it is produced, (2) spreading the collected fluff out on the ground, and (3) taking samples from the fluff after it has been spread out on the ground. In order to use this method, you will need a front-end loader, which should have a safety cab and should be used only by an experienced operator. You will also need a clean space of ground on which to spread out the fluff. In some cases, it may be necessary to arrange with the operator to start and stop the shredder at appropriate intervals.

First, the front-end loader bucket should be positioned under the mouth of the cyclone (or the end of the conveyor belt, depending on which is used) during shredding to collect the fluff. The shredder should run until the bucket is full, typically about 3 minutes, or the equivalent of about two automobiles. (Note: If large objects are being shredded, it is preferable to process the entire object, rather than part of it.) After the shredder has stopped, move the front-end loader to an open, clean area for spreading the fluff. This area should be about 10 feet square, or large enough that the contents of the front-end loader can be spread evenly to a depth of about 1 foot.

Second, have the front-end loader operator spread the collected fluff on the ground in a square area to an even depth of about 1 foot, using the back of the bucket. Divide the square into nine roughly equal subsections, as shown in Figure 2. Take one-half gallon of material from the approximate center of each subsection, using a shovel and digging down into the material; combine the samples in the 5-gallon bucket. Smaller samples may be collected on a tarpaulin placed under the cyclone or conveyor, moved to a clear area and then spread with a rake. For small samples, four roughly equal subsections may be used, with a half-gallon being selected from the center of each one.

At some sites, the fluff stream is fed continuously into rolloff boxes which can contain up to 20 cubic yards of material. In order to collect samples of fluff at these sites, the boxes must be pulled away from the output stream, which can then be collected using a front-end loader as described above.

Fresh Fluff Sampling Without a Front-End Loader. Arrange for the operator to shut down the line after shredding material for about 3 minutes. Take five one-gallon samples as follows. First, take four one-gallon samples by systematically sampling at four equidistant points around the perimeter of the pile, approximately 1 foot above the ground. Dig about 18 inches into the pile horizontally, or, depending on the size of the pile, far enough to obtain layers of fluff deposited at different times. Take the fifth sample from the center of the pile, digging down about a foot into the pile.

Stored Fluff. It is much more difficult to obtain representative samples from stored piles of fluff, but such samples are potentially more useful because they may be more representative of the normal output of the shredder. (We will assume that the stored pile to be sampled is large; small piles can be raked into a square shape, divided into nine roughly equal subsections, and sampled as described above for fresh fluff.) In collecting samples from stored piles of fluff, the objective is to obtain samples of the *oldest* fluff, the *deepest* fluff, and two samples of *surface* fluff. If a large pile of new fluff has been stored next to a smaller pile of old fluff, then the deepest fluff may not be the oldest. However, if the oldest fluff is also the deepest, take a sample half-way between the bottom and the surface in place of the deepest fluff. The procedures described below, which are illustrated in Figure 5, will provide a total of 20 one-gallon samples. To prevent cross-contamination between samples, collect one five-gallon bucket at a time.

First, take five one-gallon samples of surface fluff from the edge of the pile, at equal distances around the pile, one foot off the ground. Dig straight into the surface, including the actual surface material in the sample.

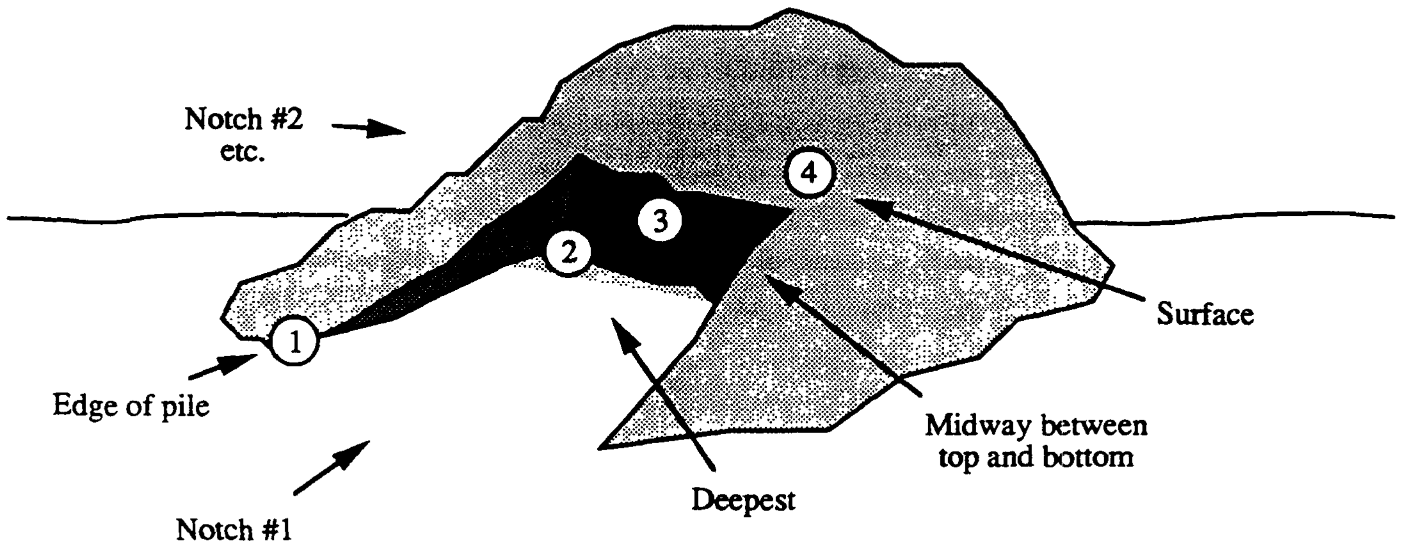


Figure 5. How to sample stored fluff

1. Take five one-gallon samples of fluff at equal distances around the edge of the pile.
2. Cut five notches at equal distances around the pile and take a one-gallon sample from the deepest fluff in each notch.
3. Take five one-gallon samples of the oldest fluff.
4. Take five one-gallon samples of fluff from the surface of the pile.

Second, use heavy moving equipment (such as a front-end loader) to cut five notches in the pile for the other samples, as shown in Figure 4. These notches should be located at equal distances along the perimeter of the pile, if possible. From each notch, take a one-gallon sample from the fluff that is deepest down in the pile. Some care may be required to get a sample of the deepest fluff in the notch, since fluff from the surface may fall down into the notch. One approach would be to have the operator remove upper layers of the pile before cutting the notch; it might also help to take the sample from the center of the notch, rather than the sides where material is more likely to fall into the notch. In making notches and collecting samples, remember that safety is a paramount consideration. Do not cut notches deeper than five feet in height. Proceed with caution at all times.

Third, collect five one-gallon samples of the oldest fluff. You will have to ask the shredder operator which fluff is the oldest. It may be a particular area of the fluff pile, or it may be the deepest layer. If it is not known which fluff is the oldest, then take a one-gallon sample from a point mid-way between the bottom of the pile and the surface in each of the notches.

Finally, collect five one-gallon samples of fluff from the surface of the pile at points near the center of the pile. The notches may provide easy access to points near the center of the pile.

As noted above, this procedure will result in 20 samples. After reviewing Section 4, which discusses analyzing the samples, you may decide that more samples are needed. The number of samples may be increased by taking more samples at each of the steps described above. For example, if *six* samples are taken from the perimeter, *six* notches are cut, etc., *six* samples of the deepest fluff are taken, and so forth, there will be 24 samples.

Spillover. During normal shredding operations, fluff will pile up along conveyor belts and cyclone separators. We will refer to this fluff as spillover. Spillover tends to consist of smaller particles, sometimes called "fines". Because these “fines” are suspected of being more susceptible to PCB contamination, you may want to take some samples of this material.

Inspect the area along the conveyor belt for spillover. Take five one-gallon samples of any spillover material along the conveyor belt at approximately equal distances. Mix these five one-gallon samples into one five-gallon bucket. If desired, repeat this procedure to fill additional buckets. In some cases, the pattern of spillover may not be regular enough to use this strategy. If necessary, identify the areas where spillover exists and take a one-gallon sample (or more) from each location to achieve one five-gallon sample (or more) that is representative of the spillover material.

2.3 Quality Assurance

The Necessity for Quality Assurance. There are many sources of error in evaluating contamination by PCBs or other substances. First, since we are selecting samples of material to analyze, there is *sampling error*, which is due to the fact that not all of the material is being analyzed and thus there is variability in the results from one sample to another. (Please note that sampling "error" is a statistical term which reflects the natural variation that exists from one sample to another. This term does *not* imply any "error" on the part of those collecting the samples!) Second, there is *analytical error*, which results from the difficulty of accurately identifying and quantifying the substances present in a given sample of material. Third, there is the possibility of errors through *cross-contamination*, which results from PCBs (or other substances) being introduced into a sample during the collection process. For example, PCBs might be present in the buckets used for data collection and then transferred to the fluff during the process of collecting samples.

Below we describe two quality control procedures. The first, the use of field blanks, will help to detect the presence of cross-contamination. The second, the analysis of duplicate samples, will help to quantify analytical error.

More extensive treatment of quality control issues can be found in the following publications:

OTS Guidance Document for the Preparation of Quality Assurance Project Plans. USEPA, Office of Toxic Substances.

Test Methods for Evaluation Solid Waste. USEPA, Office of Solid Waste and Emergency Response. SW-846, Third Edition. 1986

Analytical Chemistry of PCBs, Mitchell D. Erickson. Butterworth Publishers, Stoneham, Massachusetts. 1986.

Field Blanks. Field blanks are materials that are known *not* to contain PCBs, but which are handled using the procedures specified for collecting fluff, soil or other materials which are suspected of being contaminated. When the field blanks are analyzed, they should not contain any PCBs. Empty containers, such as buckets, should be taken to the site, opened for the duration of the time that sampling is done, and then closed and taken to the laboratory, where wipe samples can be taken and analyzed. This procedure will indicate whether containers were contaminated either before data collection or through improper handling. The use of field blanks helps protect the operator by indicating when samples are being collected improperly and possibly giving incorrect findings.

Duplicate Analyses. As a general practice, at least 10% of the samples selected should be analyzed in duplicate, meaning that the same sample (or parts of it) should be analyzed twice. In particular, if one sample has an extremely high concentration of PCBs relative to other samples, replicates should be analyzed for verification; Section 3 will discuss how replicates are formed. Preliminary studies suggest that laboratory or analytical error for the procedures described in this manual are, on average, about 30% of the estimated PCB level, ranging from 5% to 80%. If the results for replicates vary by more than this, it may be due to inadequate laboratory procedures.

3. PREPARATION FOR ANALYSIS

3.1 Preparing Fluff Samples for Laboratory Analysis

Overview. After samples are collected in the field, they must be prepared for laboratory analysis. Because of the extreme heterogeneity in some of these materials, one part of the sample can give an estimate which is not representative of the whole. In this section we will discuss procedures for splitting the collected samples into several replicates so that each replicate is representative of the original sample, containing the same components in approximately the same proportions. One or more of these replicates can then be analyzed to test for PCB contamination. The reason for creating such replicates is, first, to reduce the amount of material that is actually subjected to laboratory analysis, and, second, to create backup replicates for retesting if this becomes necessary. Altogether, at least five gallons of material should be prepared for analysis, with about 400-500 grams of this material actually undergoing analysis. In Section 3.2, we will discuss compositing, a technique for combining samples to reduce laboratory costs.

Step 1: Weigh the Fluff Sample. Determine the weight of the entire fluff sample. Since 400-500 grams of fluff are required for each replicate, weighing will indicate what fraction of each bucket of material will comprise a replicate. Generally, a five-gallon bucket of material will produce about eight replicates. However, if the weight of your fluff sample is substantially smaller than 3,200 grams or larger than 4,000 grams, then divide the weight of the sample by 450 to determine the number of replicates.

Step 2: Sort Out Large Pieces of Material. Pour the contents of the bucket onto a 9.5 mm screen above a laboratory tray or table with a nonabsorbent surface. Pieces that do not pass through the screen should be cut into pieces or milled until they are small enough to pass through the screen and then mixed into the sample. Larger pieces of material (metal, atypical wire, hard plastics) that cannot be cut with shears should be segregated. Smaller pieces of wire or other solid material that are distributed uniformly throughout the sample should remain with the sample.

Step 3: Divide Material into Replicates. Uniformly distribute the fluff which remains over the tray or table. This material will vary in composition, and dense granular materials (e.g., dirt, pulverized metal, plastics, glass, ceramics, etc.) will tend to settle below lighter material, such as shredded fabric and foam rubber. Care must be taken to ensure that these components of the fluff are uniformly distributed throughout the tray.

Using the information on the total weight of each sample, divide the fluff on the table into approximately equal parts, with the number of parts being equal to the number of replicates to be obtained. In most cases, you will divide the material on the table into eight roughly equal parts to form eight replicates.

Step 4: Cut Large Pieces and Distribute Among Replicates. In Step 2, large pieces that could not be easily cut were removed and set aside. Now cut these pieces with either tin snips or a hack saw, assuming that the materials can be cut using one of these tools, and distribute the pieces of the material equally among the replicates. If both cutting methods fail, the material should be analyzed separately, and any detected PCB levels should be prorated based on the number of replicates, the weight of the replicate, and the weight of the material. For example, suppose that eight replicates are produced, each weighing about 450 grams, and a large piece of material, weighing about 50 grams, cannot be cut. If the piece of material is analyzed and shown to have a PCB level of 30 ppm, then the revised PCB level for any replicate that is analyzed should be calculated as

$$\text{Revised PCB Level} = \frac{\frac{(30)(50)}{8} + (\text{Replicate PCBs})(450)}{\frac{(50)}{8} + (450)}\ .$$

Step 5: Place Replicates in Containers. Place each replicate in a container. Seal, label and number the container so that both the replicate number and original bucket number are included (e.g., Replicate #2 of 4 from Bucket #12).

3.2 Compositing

Because of the expense of analyzing samples at the laboratory, equal sized parts of two or more different samples are sometimes mixed together and sent to the laboratory for analysis as if the mixture were only one sample. Samples can also be composited after the preparatory steps described in Section 3.1; this method is prefereable to compositing in the field, although it may be less cost effective. We will refer to the mixed sample as a *composite* sample (or simply a *composite*) and to the parts that were mixed together as *subsamples.* This procedure is illustrated in Figure 6. Because the subsamples have been mixed, the concentration of PCBs or other toxic substances in the composite sample should be roughly equal to the average of the concentrations

1. Mix each sample thoroughly

2. Divide samples into three or four subsamples

3. Take one subsample from each sample and composite them together. Subsamples should be about the same size

4. Mix the composite sample thoroughly before analyzing

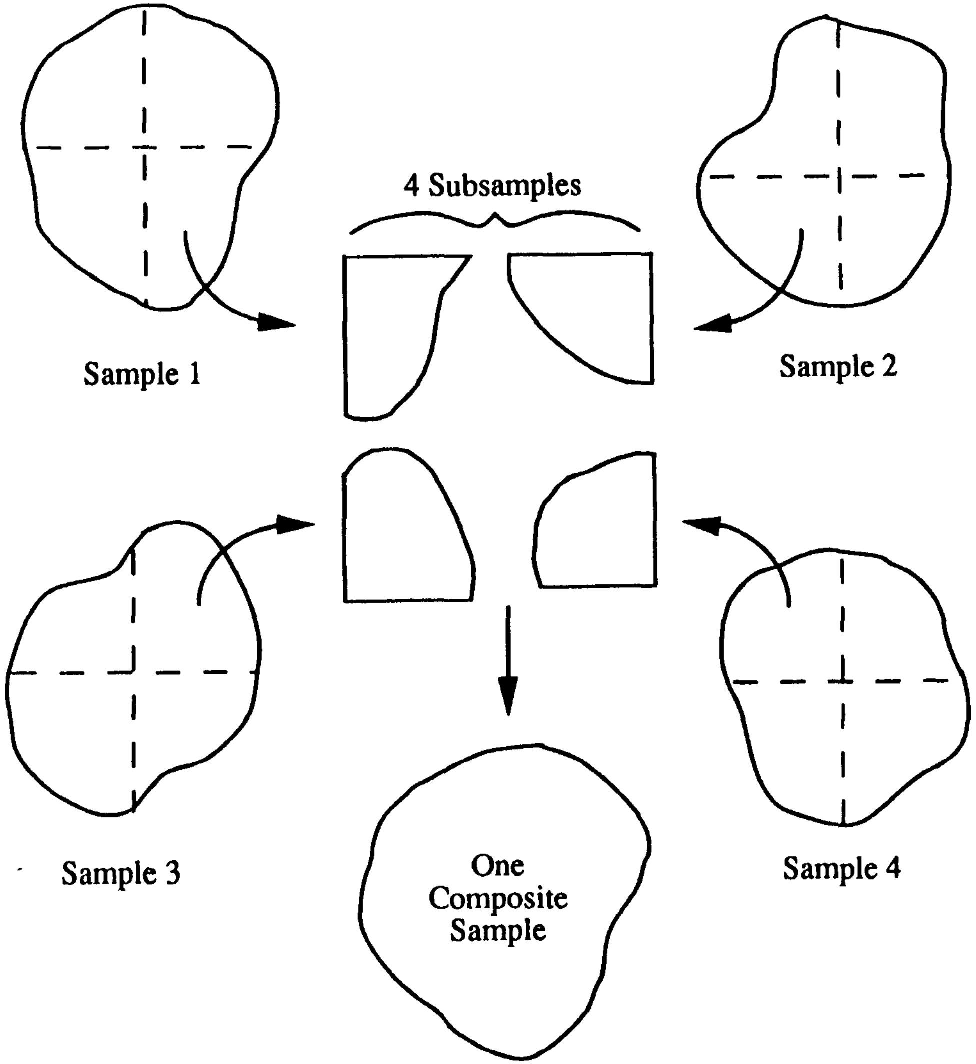


Figure 6. Guidelines for compositing samples

that would have been obtained by analyzing the subsamples individually, even though the concentrations in the subsamples may vary substantially due to the heterogeneous nature of fluff. Assuming that laboratory errors are not large compared with sampling error – which is almost always the case when analyzing samples of fluff – compositing effectively reduces the cost of laboratory analysis while maintaining about the same level of accuracy as if the samples had been analyzed individually.

When forming composite samples, several general rules should be followed. First, mix each sample thoroughly *before* compositing. Second, divide each sample into three or four parts, or subsamples. All the subsamples must be of roughly equal size. One simple method for dividing the sample is to spread the sample out on a clean area and split it into two, then four, equal parts. Another method is to take scoops of the material and put the first scoop in the first subsample, the second scoop in the second subsample, the third in the third subsample, and so on, repeating the process until the material is exhausted. Finally, take one subsample from each of the samples and combine them to make up the composite sample. Mix the composite sample thoroughly.

If the samples are from different sites or different parts of a single shredder (e.g., stored and fresh fluff), then use only one subsample – not the entire sample – for compositing. If large concentrations of toxic substances are found, it may be desirable to analyze part of each sample separately.

Throughout the next section we will discuss the effects of compositing on various analytical procedures. While compositing is normally considered to involve *two* or more subsamples, it is preferable for simplicity in presenting tables to speak of composite samples which consist of *one* or more subsamples. For example, if four samples of fresh fluff are taken over a period of 4 hours (as described in Section 2.2), these samples might be analyzed as one composite of four subsamples, two composites of two subsamples each, or as four "composites" of one subsample each.

4. EVALUATING SAMPLE RESULTS

4.1 Possible Sources of Error

In Section 3.2 we noted that there are several possible sources of error in assessing contamination by PCBs or other toxic substances. Specifically, we discussed errors due to sampling, laboratory analysis, or cross-contamination when the samples are collected. Cross-contamination creates bias and can be avoided only by careful handling of materials. However, the first two types of errors can be taken into account by using the statistical methods described in this section. For example, if the laboratory analysis of five samples of fluff at a given site shows an average PCB concentration of 60 ppm, does this conclusively indicate that the entire output of fluff from that site actually contains more that 50 ppm? Is it possible that the actual concentration is 45 ppm and the difference (i.e., 60 ppm instead of 45 ppm) is due to sampling error and/or laboratory error? In this section we discuss a statistical procedure, called a confidence interval, for answering such questions.

Because of the errors associated with the selection and analysis of samples, we cannot be sure that the numerical value (e.g., an average PCB concentration of 60 ppm) resulting from a series of laboratory tests is *exactly* accurate. Instead we must use statistical analysis to obtain an interval (e.g., 50 to 70 ppm) which we are relatively sure is accurate. This interval is called a *confidence interval* and our degree of certainty is called the *level of confidence.* For example, based on the results of our statistical calculations, we may be 95% confident that the actual average concentration is somewhere between 50 and 70 ppm. In Section 4.2 we discuss the calculations necessary for making statements like this one.

4.2 Confidence Intervals

Overview. The objective of an exploratory study is to estimate the concentrations of PCBs or other toxic substances present in the output streams, soil, or other material at a given shredder site. Because of the sampling error and laboratory error, it is not possible to determine exactly the concentration of toxic substances. However, by using the methods in this section, you will be able to make statements such as, "As a result of our study, we are 95% certain that the concentration of PCBs in this pile of stored fluff is between 40 and 100 ppm." In this statement, the interval "between 40 and 100 ppm" is called a *confidence interval.* Because of sampling and measurement errors, we are never sure of the exact concentration of a given substance in the material we are studying. By calculating confidence intervals, we obtain a range that is *likely* to contain the actual concentration. In this manual, all confidence intervals are calculated to have a 95% chance of being correct – i.e., of including the actual PCB concentration – and are thus called *95% confidence intervals.*

Preliminary Calculations. The first step is to make two basic calculations, the average and standard deviation of the samples. These calculations are illustrated in Worksheet 1. In the example given in Worksheet 1, 6 samples are analyzed and found to have measured PCB concentrations of 5, 15, 65, 11, 33, and 27 ppm, respectively. For these data, the average and standard deviation are 26 and 21.72 ppm.

Confidence Intervals for Concentrations. To find estimates of the actual concentration of PCBs or other substances, follow the calculations shown in Worksheet 2. For the example data shown in Worksheets 1 and 2, the lower and upper limits are 3.21 and 48.79 ppm, respectively, so that we are 95% certain that the estimated PCB level is between 3.21 ppm and 48.79 ppm.

Interpretation of Estimated Concentrations. What conclusions can be made based on the estimates that you have made? There are several ways to answer this first question, but the overriding concern should be whether estimated levels of PCBs and/or other toxic substances are considered to be too high. Suppose, for example, we regard 50 ppm to be an acceptable level of PCBs in shredder output. There are three possible cases:

- **Case 1:** The *upper limit* of the interval falls *below* 50 ppm. In this case, we are 95% certain that the level of PCBs is acceptable.
- **Case 2:** The *lower limit* of the interval falls *above* 50 ppm. In this case, we are 95% certain that the level of PCBs is *not* acceptable.
- **Case 3:** The *interval contains 50 ppm.* In this case we are unsure as to whether the level of PCBs is acceptable. If the interval is not too wide (e.g., 45 to 51 ppm) then we might be willing to assume that the level of PCBs is acceptable; otherwise, the study is inconclusive.

With regard to Case 3, it should be noted that most of the time it can be avoided by specifying a large enough sample size when planning the study; this problem will be discussed shortly. Furthermore, whenever it is necessary to make an absolute judgment about the safety of shredder

WORKSHEET 1: Calculation of Average and Standard Deviation

Example Data. Assume that 6 composite samples are analyzed and are estimated to have these PCB levels:

PCBs (ppm)	Squared PCBs
5.0	25.0
15.0	225.0
65.0	4,225.0
11.0	121.0
33.0	1,089.0
27.0	729.0

Step 1: Find the sum (Σ):

$$\Sigma x = 5 + 15 + \ldots + 27 = 156.0.$$

Step 2: Find the sum of the squares:

$$\Sigma x^2 = 25 + 225 + \ldots + 729 = 6{,}414.0.$$

Step 3: Find the average:

$$\text{Average} = \frac{\Sigma x}{\text{Sample Size}} = \frac{156.0}{6} = 26.0.$$

Step 4: Find the Standard Deviation:

$$\text{Variance} = \frac{\Sigma x^2 - \frac{(\Sigma x)^2}{\text{Sample Size}}}{\text{Sample Size} - 1}$$

$$= \frac{414.0 - \frac{(156.0)^2}{6}}{5}$$

$$= 471.9.$$

$$\text{Standard Deviation} = \sqrt{\text{Variance}} = 21.72.$$

WORKSHEET 2: Calculation of Confidence Intervals

Example Data. As in Worksheet 1, the example data consists of laboratory measurements from 6 composite samples, showing the following PCB levels:

PCBs (ppm)	Squared PCBs
5.0	25.0
15.0	225.0
65.0	4,225.0
11.0	121.0
33.0	1,089.0
27.0	729.0

Step 1: Find the average and standard deviation. Follow the directions in Worksheet 1. For the data shown above:

Average of Samples = 26.0

Standard Deviation = 21.72

Step 2: Estimation of Confidence Intervals. In Table 1, find the *t*-value for a sample size of 6, which is 2.57. Now make the following calculations:

$$\text{Average of Samples} - t\text{-value}\frac{\text{Standard Deviation}}{\sqrt{\text{Sample Size}}} = 26.0 - 2.57\frac{21.72}{\sqrt{6}} = 3.21$$

and

$$\text{Average of Samples} + t\text{-value}\frac{\text{Standard Deviation}}{\sqrt{\text{Sample Size}}} = 26.0 + 2.57\frac{21.72}{\sqrt{6}} = 48.79.$$

Step 3: Interpretation of Confidence Intervals. We are 95% certain that the actual PCB level is between 3.21 and 48.79.

output, then the hypothesis testing procedures described in the appendix should be used instead of the exploratory procedures discussed here.

In each of the preceding scenarios, we have used the expression "95% certain." As we discussed earlier, there will always be some uncertainty as to the actual concentration of PCBs because of sampling and laboratory error. When we say that we are 95% certain that the level of PCBs is within a given range, we simply mean that there is a 5% chance that we are wrong. Put another way, this means that if we checked PCB levels at 20 sites (or at the same site at 20 different times) using the procedures described here, we could expect, on average, that our estimate for one of the sites would be wrong.

4.3 Sample Sizes

Sample Sizes and Relative Error for PCB Levels. Because of sampling and laboratory measurement error, we can never be certain of the exact concentration of PCBs. However, by increasing the number of samples analyzed, we can reduce the degree of error in our estimates. How many samples need to be taken? There is no universal answer to this question, but based on data from preliminary studies, we can make rough estimates of the level of error that can be expected from samples sizes ranging from 1 to 25.[1]

When we select a sample and average the measured PCBs, there is always some difference between our *sample average* and the *true concentration* of PCBs in the sampled material. This difference represents error that is due to both sampling and laboratory analysis. The *relative error* is the absolute difference between the *sample* and *true* concentrations divided by the *true* value:

$$\text{Relative Error} = \left| \frac{\text{Sample Average} - \text{True Concentration}}{\text{True Concentration}} \right| .$$

Since the sample average is subject to random fluctuations, the relative error will vary also, and we will never know the relative error for any given sample. However, as the sample size increases,

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[1] The estimates for standard errors, sample sizes and precision presented here are based on preliminary data from an EPA-supported study of 85 samples collected at seven shredder sites throughout the country and on a dataset of 200 samples collected and analyzed by various state and local agencies.

Table 1: t-values for confidence intervals

Number of composite samples	t-values
2	12.71
3	4.30
4	3.18
5	2.77
6	2.57
7	2.45
8	2.36
9	2.31
10	2.26
11	2.23
12	2.20
13	2.18
14	2.16
15	2.15
16	2.13
17	2.12
18	2.11
19	2.10
20	2.09
21	2.09
22	2.08
23	2.07
24	2.07
25	2.06
30	2.05
50	2.01
75	1.99
100	1.98
>100	1.96

*The values shown in the table are taken from Student's t distribution. This distribution is often used as a measure of uncertainty due to sampling and other sources of error the relative errors decrease and, although the relative error may change from one sample to another, we can give a value, the *maximum relative error*, that it will generally not exceed.

Table 2 shows the maximum relative error for estimating PCB levels with sample sizes of 1 to 25. Unfortunately, even to get 50% maximum relative error may require a large number of samples. For example, if 10% white goods are processed (with 90% automobiles or other materials), approximately 25 samples are required to obtain 50% maximum relative error when no compositing is used. Notice that when compositing is used, the number of samples that must be analyzed to achieve a desired maximum relative error is reduced. For example, 64% maximum relative error can be expected when 16 samples are analyzed without compositing. If 18 samples are composited into 9 groups of 2 samples each, however, then 68% maximum relative error can be obtained by analyzing the 9 composited samples. There is a slight increase in maximum relative error (since 68% is greater than 64%), but the laboratory costs are reduced almost by half (i.e., 9 samples analyzed instead of 16). Finally, notice that to obtain maximum relative error of less than 25% requires very large sample sizes, even when compositing is used.

In discussing sampling over time in Section 2, we recommended taking samples every half-hour for at least 8 hours, which would result in 16 samples. From Table 2, we see that the resulting maximum relative error would be about 64%, if no compositing is used. This will be adequate when the level of PCBs found is low (e.g., 10 to 20 ppm), but may be unacceptable if a high level of PCBs is found. If the 16 samples are composited into 8 composite samples of 2 subsamples each, the maximum relative error would be about 70% (i.e., slightly higher than that shown for 9 composites of 2 subsamples each). If the 16 samples are composited into 4 composites of 4 subsamples each, the maximum relative error increases to 106%. Again, this is probably acceptable when the level of PCBs is low, but will not be acceptable when the PCB level is, say, 20 or 30 ppm. The sampling procedures described in Section 2 for stored fluff will produce 20 samples; the maximum relative error for 20 samples would be similar to those for 16 samples, although slightly lower.

The key factor in deciding how many samples to take is the maximum relative error desired. In deciding the maximum relative error, the concentration of PCBs must also be taken into account. Suppose, for example, that the actual PCB concentration is 10 ppm and that we estimate the level of PCBs as being between 0 and 20 ppm. Then the maximum relative error is 100%, but since the estimated PCB concentration is well below the 50 ppm standard, this level of error is acceptable. However, if the actual PCB concentration is 50 ppm and we estimate that the level of PCBs is between 0 and 100 ppm, the maximum relative error is again 100%, but it is

Table 2: Relative error for estimating PCB levels with sample sizes of 2 to 25

Total samples collected	**Number of composites analyzed**	**Subsamples in each composite**	**Maximum relative error***
2	2		1084%
4	4		192%
9	9	1	93%
16	16		64%
25	25		50%
4	2		793%
8	4		140%
18	9	2	68%
32	16		47%
50	25		36%
8	2		597%
16	4		106%
36	9	4	51%
64	16		35%
100	25		27%
16	2		468%
32	4		83%
72	9	8	40%
128	16		28%
200	25		21%

*A relative error of 50% means that with 95% certainty, the estimated average concentration will be within 50% of the actual average concentration. A relative concentration of more than 100% (e.g., 150%) has the same interpretation (e.g., the estimated concentration will be between 0% and 1.5 times the actual concentration).

clearly not acceptable. In exploratory studies, high relative errors can generally be tolerated, since more data can be collected to investigate the situation more closely if high levels of PCBs are suspected.

Sample Sizes and Relative Error for Lead and Cadmium. In general, the samples sizes required for estimating PCB levels should be more than adequate for estimating levels of lead and cadmium. Analysis of preliminary data indicates that both sampling and measurement errors are smaller for these substances than for PCBs. Comparable data for other toxic substances is not available.

4.4 Analytical Methods for Other Objectives

Exploratory studies are only one possible objective of sampling for PCBs at shredder sites. Another objective would be monitoring shredder output to make sure that PCB levels do no exceed a given level. In practice, monitoring programs are often put in place by shredder operators to verify to landfill operators that fluff from the site meets TSCA landfill regulations. A third objective would be "clean-up" verification, which might be required if a site – or the fluff produced at a site – were found to be extensively contaminated with PCBs. In both cases, the statistical method of *hypothesis testing* would be used in place of confidence intervals. These topics are discussed in an appendix.

4.5 Additional Reading

For more details on statistical procedures for use in environmental sciences, see

Statistical Methods for Environmental Pollution Monitoring, Richard O. Gilbert. Van Nostrand Reinhold Company Inc. 1987.

APPENDIX

ANALYTICAL METHODS FOR REGULATORY PROCEDURES

A.1. Introduction

A.1.1 Objectives of Regulatory Procedures

As discussed in the Section 1, there are several possible objectives in sampling for PCB's. Analytical methods for exploratory studies were discussed in Section 4 of the *Sampling Guidance.* The two objectives of regulatory functions are monitoring and clean-up verification. This appendix discusses statistical methods for these applications.

When monitoring the output of a shredder site, the monitoring agency – which may be the shredder operator or an outside agency – develops a program of regular sampling and analysis of materials to assure that shredder output meets specified standards. In this situation, the output is *assumed not to be contaminated* until the samples collected for the monitoring program demonstrate otherwise.

In the event that a shredder site or output from a site is established as being contaminated with PCB's – if large piles of stored fluff or the soil around the site are known to contain high concentrations of PCB's, for example – then it may become necessary for the site to undergo some form of clean-up or change in operating procedures. In this case, the site (or output from it) is *assumed to be contaminated* until the samples collected during the clean-up verification demonstrate otherwise.

The statistical methods for these two applications appear to be very similar. In each case, the average PCB concentration is found and compared with a known value to make conclusions about the PCB level. Although the procedures differ slightly in the methods of calculation, the important difference is in the decision-making process indicated by the italics shown above. While the procedures discussed in Sections A.2 and A.3 may appear redundant, purpose of the analysis and the conclusions that would be reached are different.

A.1.2 Sampling Issues

A number of sampling issues arise in planning monitoring and clean-up verification programs. These issues are mainly related to the frequency and duration of visits to the shredder site to collect samples. This is more of an issue for monitoring programs, where regular visits are more likely to be required.

Should samples be collected once a week? Once a month? Four times a year? In deciding how often to collect samples, it must be remembered that the material output from a shredder is the direct product of the input to the shredder. The primary objective in sampling is to obtain a representative sample of the material that is output during the normal operation of the shredder. It is possible for the shredder operator to run only "clean" materials – for example, materials that have had all electric motors, air conditioning units, etc., removed – while the samples are being collected. If this is done, the samples may not reflect the materials that are normally output at the shredder.

Ultimately, the question of "how often" is really less important than whether the samples collected are representative of the normal output of the shredder. Obviously, samples taken four times a year may not be representative of the output being produced during the rest of the year. However, sampling even once a week may not be sufficient if the samples selected are not representative.

When monitoring programs are in place, sampling usually takes place at regular intervals, ranging anywhere from four times a year to once a week. Within this context, samples may be collected once a visit, once each half-hour for several hours, or once each half-hour for an entire day. As part of either a monitoring or a clean-up program, we suggest collecting samples of fresh shredder output each half-hour for a period of 8 hours, or one work day. As noted in the *Sampling Guidance*, the longer the duration of the sampling period, the greater the likelihood of obtaining a representative sample of shredder output. Sampling for an entire working day is likely to provide good representation of the shredder's normal operations, at least for that day, and also will provide a minimum number of samples for statistical analysis.

A.1.3 Hypothesis Testing

As we have noted, there are several possible sources of error in assessing contamination by PCB's or other toxic substances. For exploratory studies, we used confidence intervals as a statistical procedure for analyzing data in the presence of error. For monitoring and clean-up programs, hypothesis tests are the primary analytical tool.

In hypothesis testing, an assumption is made – for example, that the normal fluff output of a given shredder site has a PCB concentration that is 50 ppm or less – and then evaluated in relation to the results of a laboratory test. For example, suppose that laboratory tests indicate that the average concentration in samples collected is 60 ppm. We know that because of sampling and measurement errors, the *actual* concentration is not *exactly* 60 ppm. In an hypothesis test, we do a set of calculations which provide a numerical cut-off against which our sample value is compared. This cut-off depends on the number of samples analyzed and some other considerations. For example, suppose that the cut-off is 75 ppm. Comparing the sample estimate of 60 to the cut-off value of 75, we would conclude that the laboratory results are within the range of sampling and laboratory error and that we do not have sufficient evidence to conclude that the output of the shredder is more than 50.

A.2. Monitoring

A.2.1 Considerations in Monitoring Programs

As we discussed earlier, the objective of a monitoring program is to make sure that the output of a shredding operation meets some specified standard. Frequently this standard is taken to be 50 ppm, since this is the requirement for TSCA landfills, but other standards might be considered as well. In this manual, we will use three possible standards – 25, 50 and 100 ppm – as illustrations. Monitoring programs may also vary with respect to the frequency and duration of sampling. Samples of output materials may be taken weekly, monthly, or quarterly, with samples collecting over several hours or an entire day. In most cases, the sample sizes discussed for monitoring are intended for a single visit.

There are two major difficulties in monitoring shredder sites. First, because of the time delay in having samples analyzed, the actual shredder output that is sampled will probably be in a landfill by the time the analysis is done to determine whether it is contaminated or not. Second, the amount of PCB's can be loosely controlled by processing different materials, since, for example, automobiles appear to be less likely to produce PCB contaminated output than white goods. Thus, shredder operators being monitored by outside agencies could deliberately process materials with low PCB levels during the monitoring period. If the materials processed during the monitoring period are not representative of the normal output of the shredder, then the results of the monitoring program will not be valid.

Clearly, monitoring programs, which depend on statistical principles and random inspections, cannot detect all violations. The best strategy for keeping contaminated output out of landfills is to develop monitoring programs that are *likely* to detect *most* violations, so that appropriate enforcement actions can be taken. One of the key steps in developing an effective monitoring program is to collect representative samples. We suggest three steps. First, regulatory agencies can make unannounced visits to the shredder site at randomly chosen times to help assure obtaining representative samples. Similarly, shredder operators can collect samples at irregular intervals to help assure representative sampling. Second, the longer the duration of the data collection period, the more likely that shredder input will be representative; we recommend that the monitoring period last 8 hours or for the normal duration of operating hours. Finally, samples of stored fluff and spillover should be collected, in addition to fresh fluff, since these materials are likely to reflect the output during normal operation even when fresh fluff may not.

A.2.2 Hypothesis Testing for Monitoring Programs

When monitoring the output of a shredder site, it is first assumed that the output streams are *not* contaminated. Samples are collected and chemically analyzed at intervals to monitor the shredder output, and, based on a statistical analysis of these samples, the monitoring agency determines whether this assumption – i.e., that the shredder output is in compliance with safety standards – is reasonable. The process used to make this determination is called a *hypothesis test*. The basic steps are simple: the average and standard deviation are calculated, a cut-off value is determined and the average is compared to the cut-off value. If the average is larger than the cut-off value, then the output is declared in violation, otherwise it is assumed to be in compliance. In the following sections we will discuss how to determine the cut-off value and the sample sizes necessary for making hypothesis tests.

As we discussed earlier, the presence of sampling error and analytical error make it difficult to determine whether shredder output is in compliance with regulations. The fact that chemically analyzed samples are above the safety standard is not sufficient evidence that the entire output from which the samples were taken is in violation. A more careful evaluation must be done to account for sampling and analytical error. The procedure that must be followed is illustrated in an example in Worksheet A-1.

The first step is to find the average and standard deviation using the procedures given in Worksheet 1 in Section 4. Next, the cut-off value must be determined. This value can be found by following the calculations in Worksheet A-1. Finally, to evaluate whether or not shredder output violates the relevant standard, simply compare the average of the analyzed samples to the cut-off value and follow these rules:

- If the average is *larger* than the cut-off, conclude that the output violates the standard
- If the average is *smaller* than the cut-off, assume that the output is in compliance with the standard.

A.2.3 Effects of Sampling and Analytical Error

Like all decisions that are based on statistical methods, hypothesis testing procedures are subject to error. For example, in a pile of fluff that is relatively free of PCB's, we may pick a sample simply by chance that has an unusually dense concentration of PCB's, leading us to conclude that the entire pile of fluff is contaminated. In this case we would *incorrectly conclude that the output was in violation.* On the other hand, in a pile of fluff that is heavily contaminated, we might happen to pick a sample that has a relatively low level of PCB's, leading us to *incorrectly conclude that the output is in compliance.* These two errors have many names in the statistical literature, but they are most commonly called "Type 1" and "Type 2" errors, respectively.

Worksheet A–1: Hypothesis Testing for Monitoring PCB Levels

Example Data. Assume that 4 composite samples are analyzed and have these PCB levels:

PCB's (ppm)	Squared PCB's
70.0	4,900.0
121.0	14,641.0
48.0	2,304.0
51.0	2,601.0

Step 1: Find the average and standard deviation. Use the directions in Worksheet 1. For the example data given above:

Average of Samples = 72.50

Standard Deviation = 33.77

Step 2: Determine the Cut-Off Value. Make the following calculations:

- **Short-Cut Method.** In Table A-1, select the appropriate safety standard and then find the cut-off which corresponds to the standard deviation and sample size that are closest to the yours. For the example data, the standard deviation and sample size are 33.77 (which is close to 35) and 4. Assuming the safety standard is 50, the cut-off is 91.1.

- **Exact Method.** This method is slightly more complicated. First, in Table A-2, find the *t*-value for a sample size of 4, which is 2.35. Now make the following calculation:

  $$\text{Cut-Off Value} = \text{Standard} + t\text{-value}\frac{\text{Standard Deviation}}{\sqrt{\text{Sample Size}}}\ .$$

  If the standard is 50 ppm, then

  $$\text{Cut-Off Value} = 50 + 2.35\frac{33.77}{\sqrt{4}} = 89.7.$$

Step 3: Interpretation. Since the average, 72.5, is smaller than the cut-off, 91.1 (using Method 1, or 89.7, using Method 2) we do not have sufficient evidence to conclude that the output exceeds the 50 ppm safety standard.

Table A-1: Cut-off values for monitoring*

Safety Standard	Standard Deviation	Number of Composite Samples Analyzed				
		2	4	9	16	25
25	20	114.2	48.5	37.4	33.8	31.8
	35	181.2	66.1	46.7	40.3	37.0
	50	248.1	83.8	56.0	46.9	42.1
	75	359.6	113.1	71.5	57.8	50.7
	100	471.2	142.5	87.0	68.8	59.2
	150	694.3	201.3	118.0	90.6	76.3
	250	1,140.5	318.8	180.0	134.4	110.5
50	20	139.2	73.5	62.4	58.8	56.8
	35	206.2	91.1	71.7	65.3	62.0
	50	273.1	108.8	81.0	71.9	67.1
	75	384.6	138.1	96.5	82.8	75.7
	100	496.2	167.5	112.0	93.8	84.2
	150	719.3	226.3	143.0	115.6	101.3
	250	1,165.5	343.8	205.0	159.4	135.5
100	20	189.2	123.5	112.4	108.8	106.8
	35	256.2	141.1	121.7	115.3	112.0
	50	323.1	158.8	131.0	121.9	117.1
	75	434.6	188.1	146.5	132.8	125.7
	100	546.2	217.5	162.0	143.8	134.2
	150	769.3	276.3	193.0	165.6	151.3
	250	1,215.5	393.8	255.0	209.4	185.5

*If the average of the analyzed samples is larger than the cut-off value in the table, then conclude that the shredder output violates the given standard. Otherwise, assume that the output meets the standard. The chance of incorrectly finding a violation is 5%.

Table A-2: t-values for hypothesis tests*

Number of composite samples	t-values
2	6.31
3	2.90
4	2.35
5	2.13
6	2.02
7	1.94
8	1.89
9	1.86
10	1.83
11	1.81
12	1.80
13	1.78
14	1.77
15	1.76
16	1.75
17	1.75
18	1.74
19	1.73
20	1.73
21	1.73
22	1.72
23	1.72
24	1.71
25	1.71
30	1.70
50	1.68
75	1.67
100	1.66
>100	1.65

*The values shown in the table are taken from Student's t distribution. This distribution is often used as a measure of uncertainty due to sampling and other sources of error.

Using the procedure described in Worksheet A–1, you will have a 5% chance of making a Type 1 error – that is, of concluding that output is in violation when in fact it is not. The chance of this type of error is 5% regardless of the sample size. The chance of a Type 2 error – the chance of missing violations when they actually exist – does depend on the sample size. Because characteristics of fluff vary from place to place, it is difficult to determine the exact probability of making a Type 2 error, but based on preliminary studies we have made some approximate calculations that are shown in Tables A–3 through A–5. These tables give the chance of correctly identifying violations (i.e., *not* making a Type 2 error) for a range of sample sizes and hypothetical PCB levels for safety standards of 25, 50, and 100 ppm.

For example, in Worksheet A-1, the hypothesis test based on four samples concluded that the output met the 50 ppm safety standard. In Table A-4 (which covers the 50 ppm standard) we see that with 4 composite samples, assuming each consists of 1 subsample, the chance of detecting a violation of even 125 ppm is only 11%. Thus, we should not feel too confident that the material is actually in compliance with the standard. As might be expected, the larger the sample size the greater the chance of detecting violations. This is true if the sample size is increased by analyzing more composite samples or by compositing more subsamples together. Thus, when 9 composites of one subsample each are analyzed, the chance of detecting a violation of 125 ppm is 44%, meaning that 44% of the time a violation of 125 would be detected using procedures like this, while 56% of the time a PCB level of 125 would remain undetected. Notice that the situation improves substantially if 9 composites are used with 4 subsamples each, in which case the chance of detecting a violation of 125 ppm increases to 88%.

A.3. Clean-up Verification

A.3.1 Considerations in Clean-up Verification

In exploratory studies, there is little if any prior knowledge about contamination by PCB's or other substances at a site. In monitoring programs, it is assumed that shredder output streams are in compliance with PCB standards unless the data indicate otherwise. However, when a statistical evaluation is undertaken to verify a site

Table A-3: Chance of finding violations in monitoring with a 25 ppm standard

Total samples collected	Number of composites analyzed	Subsamples in each composite	Chance of detecting violation*				
			Actual PCB concentration				
			30	35	40	50	60
2	2	1	0.00	0.00	0.00	0.00	0.00
4	4		0.02	0.04	0.05	0.08	0.11
9	9		0.08	0.15	0.22	0.33	0.42
16	16		0.13	0.25	0.37	0.56	0.68
25	25		0.18	0.36	0.53	0.75	0.86
4	2	2	0.00	0.00	0.00	0.00	0.00
8	4		0.03	0.05	0.08	0.14	0.20
18	9		0.11	0.22	0.34	0.53	0.65
32	16		0.19	0.39	0.57	0.79	0.89
50	25		0.26	0.55	0.76	0.93	0.98
8	2	4	0.00	0.00	0.00	0.00	0.00
16	4		0.04	0.08	0.14	0.25	0.35
36	9		0.15	0.34	0.51	0.75	0.86
64	16		0.26	0.57	0.78	0.95	0.99
100	25		0.38	0.76	0.93	0.99	1.00
16	2	8	0.00	0.00	0.00	0.00	0.00
32	4		0.05	0.12	0.22	0.40	0.54
72	9		0.21	0.48	0.69	0.90	0.96
128	16		0.36	0.74	0.92	0.99	1.00
200	25		0.51	0.90	0.99	1.00	1.00

*Power calculations assume a 5% chance of incorrectly finding a violation.

Table A-4: Chance of finding violations in monitoring with a 50 ppm standard

Total samples collected	Number of composites analyzed	Subsamples in each composite	Chance of detecting violation*				
			Actual PCB concentration				
			60	70	85	100	125
2	2	1	0.00	0.00	0.00	0.00	0.00
4	4		0.02	0.04	0.06	0.08	0.11
9	9		0.08	0.15	0.25	0.33	0.44
16	16		0.13	0.25	0.43	0.56	0.70
25	25		0.18	0.36	0.60	0.75	0.87
4	2	2	0.00	0.00	0.00	0.00	0.00
8	4		0.03	0.05	0.10	0.14	0.21
18	9		0.11	0.22	0.39	0.53	0.68
32	16		0.19	0.39	0.64	0.79	0.91
50	25		0.26	0.55	0.83	0.93	0.98
8	2	4	0.00	0.00	0.00	0.00	0.00
16	4		0.04	0.08	0.17	0.25	0.37
36	9		0.15	0.34	0.59	0.75	0.88
64	16		0.26	0.57	0.85	0.95	0.99
100	25		0.38	0.76	0.96	0.99	1.00
16	2	8	0.00	0.00	0.00	0.00	0.00
32	4		0.05	0.12	0.27	0.40	0.56
72	9		0.21	0.48	0.77	0.90	0.97
128	16		0.36	0.74	0.96	0.99	1.00
200	25		0.51	0.90	1.00	1.00	1.00

*Power calculations assume a 5% chance of incorrectly finding a violation.

Table A-5: Chance of finding violations in monitoring with a 100 ppm standard

Total samples collected	Number of composites analyzed	Subsamples in each composite	Chance of detecting violation*				
			Actual PCB concentration				
			125	150	175	200	250
2	2	1	0.00	0.00	0.00	0.00	0.00
4	4		0.02	0.04	0.06	0.08	0.11
9	9		0.10	0.18	0.26	0.33	0.44
16	16		0.16	0.31	0.45	0.56	0.70
25	25		0.22	0.45	0.63	0.75	0.87
4	2	2	0.00	0.00	0.00	0.00	0.00
8	4		0.03	0.07	0.11	0.14	0.21
18	9		0.14	0.28	0.42	0.53	0.68
32	16		0.24	0.49	0.68	0.79	0.91
50	25		0.34	0.67	0.85	0.93	0.98
8	2	4	0.00	0.00	0.00	0.00	0.00
16	4		0.05	0.11	0.18	0.25	0.37
36	9		0.20	0.43	0.62	0.75	0.88
64	16		0.34	0.69	0.87	0.95	0.99
100	25		0.49	0.86	0.97	0.99	1.00
16	2	8	0.00	0.00	0.00	0.00	0.00
32	4		0.06	0.17	0.29	0.40	0.56
72	9		0.27	0.59	0.80	0.90	0.97
128	16		0.47	0.85	0.97	0.99	1.00
200	25		0.65	0.96	1.00	1.00	1.00

*Power calculations assume a 5% chance of incorrectly finding a violation.

clean-up, it must be assumed that the site (or the output stored on a site) is contaminated until the data demonstrate that an effective clean-up has been carried out. Except for this important distinction, the procedures for clean-up verification are nearly identical to those described in Section A.2.

A.3.2 Hypothesis Testing for Clean-up Verification

The procedure for determining cut-off values in clean-up evaluation is illustrated in an example in Worksheet A–2. As before, the first step is to find the average and standard deviation using the procedures given in Worksheet 1. Next, the cut-off value is determined, either by following the calculations in Worksheet A–2 or from Table A–6. Finally, to evaluate whether or not the output attains the safety standard, simply compare the average of the analyzed samples to the cut-off value as follows:

- If the average is *smaller* than the cut-off, conclude that the site has attained the safety standard; and
- If the average is *larger* than the cut-off, assume that the site is still in violation and requires further clean-up.

A.3.3 Effects of Sampling and Analytical Error

Because of sampling and analytical error, these procedures are subject to Type 1 and Type 2 errors, just like the methods described in Section 2. Here the possible errors are (1) concluding that the site has attained the safety standard when the actual concentration of PCB's still exceeds it, and (2) concluding that additional clean-up is required when in fact the site has attained the safety standard.

For the methods described above, the chance of incorrectly concluding that the site has attained the safety standard is at most 5%. (It is exactly 5% when the actual level of PCB's meets the standard and it decreases sharply as the level of PCB's increases.) Tables A–7 through A–9 show the chance of requiring additional clean-up for standards of 25, 50, and 100 ppm when the concentration of PCB's at the site actually meet the standard. This probability becomes larger when either the level of PCB's approaches the standard, or when the sample size is small. It should be noted that because clean-up will

Worksheet A–2: Hypothesis Testing for Verifying Clean-Up of PCB's

Example Data. Assume that 4 composite soil samples from the cleaned site are analyzed and have the following PCB levels:

PCB's (ppm)	Squared PCB's
11.0	121.0
5.0	25.0
52.0	2,704.0
10.0	100.0

Step 1: Find the average and standard deviation. Use the directions in Worksheet 1. For the example data given above:

Average of Samples = 19.50

Standard Deviation = 21.83

Step 2: Determine the Cut-Off Value. Make the following calculations:

- **Short-Cut Method.** In Table A-6, select the appropriate standard and find the cut-off which corresponds to the standard deviation and sample size which are closest to yours. Assume the standard is 50 ppm. For the example data, the standard deviation and sample size are 21.83 (which is close to 20) and 4, indicating a cut-off of 26.5.
- **Exact Method.** This method is slightly more complicated. First, in Table A-2, find the *t*-value for a sample size of 4, which is 2.35. Now make the following calculation:

$$\text{Cut-Off Value} = \text{Standard} - t\text{-value}\frac{\text{Standard Deviation}}{\sqrt{\text{Sample Size}}} .$$

For the example data,

$$\text{Cut-Off Value} = 50 - 2.35\frac{21.83}{\sqrt{4}} = 24.3.$$

Step 3: Interpretation. Since the average, 19.5, is smaller than the cut-off, 26.5 (using Method 1, or 24.3, using Method 2), we can conclude that the site meets the 50 ppm standard.

Table A-6: Cut-off values for clean-up verification

Standard	Standard deviation	Number of composite samples analyzed				
		2	4	9	16	25
25	10	–	13.3	18.8	20.6	21.6
	15	–	7.4	15.7	18.4	19.9
	20	–	1.5	12.6	16.3	18.2
	25	–	–	9.5	14.1	16.5
	35	–	–	3.3	9.7	13.0
	50	–	–	–	3.1	7.9
	65	–	–	–	–	2.8
50	10	5.4	38.3	43.8	45.6	46.6
	20	–	26.5	37.6	41.3	43.2
	30	–	14.8	31.4	36.9	39.7
	50	–	–	19.0	28.1	32.9
	60	–	–	12.8	23.8	29.5
	75	–	–	3.5	17.2	24.4
	125	–	–	–	–	7.3
100	15	33.1	82.4	90.7	93.4	94.9
	25	–	70.6	84.5	89.1	91.5
	50	–	41.3	69.0	78.1	82.9
	75	–	11.9	53.5	67.2	74.4
	100	–	–	38.0	56.3	65.8
	150	–	–	7.0	34.4	48.7
	250	–	–	–	–	14.5

*A dash (–) indicates that the standard deviation is too large to establish that the site is clean.

Table A-7: Chance of requiring additional clean-up with a 25 ppm standard

Total samples collected	Number of composites analyzed	Subsamples in each composite	Chance of requiring more clean-up*				
			Actual PCB concentration				
			1	5	10	15	20
2	2	1	–	0.82	1.00	1.00	1.00
4	4		–	–	0.31	0.86	0.97
9	9		–	–	0.01	0.48	0.87
16	16		–	–	–	0.22	0.79
25	25		–	–	–	0.07	0.70
4	2	2	–	0.16	1.00	1.00	1.00
8	4		–	–	0.07	0.74	0.96
18	9		–	–	–	0.24	0.81
32	16		–	–	–	0.05	0.68
50	25		–	–	–	–	0.54
8	2	4	–	–	1.00	1.00	1.00
16	4		–	–	–	0.54	0.93
36	9		–	–	–	0.07	0.72
64	16		–	–	–	–	0.53
100	25		–	–	–	–	0.35
16	2	8	–	–	0.97	1.00	1.00
32	4		–	–	–	0.33	0.90
72	9		–	–	–	0.01	0.61
128	16		–	–	–	–	0.37
200	25		–	–	–	–	0.18

*These calculations assume a 95% (or greater) chance of requiring additional clean-up when the concentration of PCB's is 25 ppm or greater. A dash (–) indicates that the chance is less than .005.

Table A-8: Chance of requiring additional clean-up with a 50 ppm standard

Total samples collected	Number of composites analyzed	Subsamples in each composite	Chance of requiring more clean-up*				
			Actual PCB concentration				
			10	15	20	30	40
2	2	1	0.82	1.00	1.00	1.00	1.00
4	4		–	0.02	0.31	0.86	0.97
9	9		–	–	0.01	0.48	0.87
16	16		–	–	–	0.22	0.79
25	25		–	–	–	0.07	0.70
4	2	2	–	0.16	1.00	1.00	1.00
8	4		–	–	0.07	0.74	0.96
18	9		–	–	–	0.24	0.81
32	16		–	–	–	0.05	0.68
50	25		–	–	–	–	0.54
8	2	4	–	0.77	1.00	1.00	1.00
16	4		–	–	–	0.54	0.93
36	9		–	–	–	0.07	0.72
64	16		–	–	–	–	0.53
100	25		–	–	–	–	0.35
16	2	8	–	0.27	0.97	1.00	1.00
32	4		–	–	–	0.33	0.90
72	9		–	–	–	0.01	0.61
128	16		–	–	–	–	0.37
200	25		–	–	–	–	0.18

*These calculations assume a 95% (or greater) chance of requiring additional clean-up when the concentration of PCB's is 50 ppm or greater. A dash (–) indicates that the chance is less than .005.

Table A-9: Chance of requiring additional clean-up with a 100 ppm standard

Total samples collected *m*	Number of composites analyzed *m/c*	Subsamples in each composite *c*	Chance of requiring more clean-up*				
			Actual PCB concentration				
			20	30	40	60	80
2	2	1	0.82	1.00	1.00	1.00	1.00
4	4		–	0.02	0.31	0.86	0.97
9	9		–	–	0.01	0.48	0.87
16	16		–	–	–	0.22	0.79
25	25		–	–	–	0.07	0.70
4	2	2	0.16	0.98	1.00	1.00	1.00
8	4		–	–	0.07	0.74	0.96
18	9		–	–	–	0.24	0.81
32	16		–	–	–	0.05	0.68
50	25		–	–	–	–	0.54
8	2	4	–	0.77	1.00	1.00	1.00
16	4		–	–	–	0.54	0.93
36	9		–	–	–	0.07	0.72
64	16		–	–	–	–	0.53
100	25		–	–	–	–	0.35
16	2	8	–	0.27	0.97	1.00	1.00
32	4		–	–	–	0.33	0.90
72	9		–	–	–	0.01	0.61
128	16		–	–	–	–	0.37
200	25		–	–	–	–	0.18

*These calculations assume a 95% (or greater) chance of requiring additional clean-up when the concentration of PCB's is 100 ppm or greater. A dash (–) indicates that the chance is less than .005.

remove PCB's from the contaminated area, the homogeneity of samples taken after clean-up may be greater; that is, the standard deviations *after* clean-up may be smaller than the standard deviations before clean-up. In this case, the chance of requiring additional clean-up would be decreased from the values shown in Tables A-7 through A-9.

Notice that the probability of being required to do additional clean-up is related to both the PCB level remaining after clean-up – and thus to the intensity of the clean-up effort – and to the amount of data collected for verification. For example, suppose that the standard is 50 ppm. If the clean-up effort is less rigorous, resulting in residual PCB levels of about 30 ppm, say, then it will require more data to verify the clean-up than if the clean-up had been more intensive and the residual PCB level were only 20 ppm. This point has implications for allocating funds between the clean-up and verification efforts.

Clean-Up Verification for Lead and Cadmium. Because of smaller sampling and measurement errors, it is easier to detect whether lead and/or cadmium have been cleaned up with the amount of data required for detecting clean-up of PCB's.

A.3.4 What to Do When Clean-Up Is *Not* Verified

When the sample results indicate that the site has not been cleaned up thoroughly, it is very important to realize that it is *not sufficient* to simply clean and re-inspect the parts of the site that are in the sample. The reason for this is that the samples collected are representative of the entire site; if the collected samples have not been thoroughly cleaned up, then it must be assumed that the rest of the site has not been satisfactorily cleaned up, either.

Therefore, where clean-up does not pass verification, the *entire site* must be cleaned again! Then, after the site has been cleaned, all the verification steps must be repeated using a second, *independent* collection of samples.

50272-101

REPORT DOCUMENTATION PAGE

1. REPORT NO. EPA 747-R-93-009

2.

3. Recipient's Accession No.

4. Title and Subtitle
Sampling Guidance for Scrap Metal Shredders
Field Manual

5. Report Date August 1993

6.

7. Author(s)
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8. Performing Organization Rept. No.

9. Performing Organization Name and Address
Westat, Inc.
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Rockville, MD 20850

10. Project/Task/Work Unit No.

11. Contract (C) or Grant (G) No.
68-02-4293

12. Sponsoring Organization Name and Address
U.S. Environmental Protection Agency
Office of Prevention, Pesticides and Toxic Substances
Washington, D.C. 20460

13. Type of Report & Period Covered Technical Report

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The purpose of this document is to provide basic instructions for collecting and statistically analyzing samples of materials that are produced as a result of shredding automobiles and other metal objects, since the by-products of these recycling operations may contain concentrations of polychlorinated biphenyl's (PCBs). Shredders are large machines that convert light metal objects into fist size or smaller pieces of scrap metal. PCBs enter the shredder output when materials containing PCB-bearing fluids are shredded. Large concentrations of PCBs have been identified in some samples that have been collected at some recycling sites. Thus agencies may wish to collect data at shredder sites in order to study the situation in their locality. The sampling procedures described in this document are intended to produce representative samples of fluff that will give reasonably accurate estimates of the overall concentration of PCBs in the material being sampled. The document discusses sample selection, laboratory testing, and statistical procedures for analyzing the data.

17. Document Analysis a. Descriptors
Environmental contaminants, scrap metal recycling

b. Identifiers/Open-Ended Terms
PCB, sampling, statistical analysis

c. COSATI Field/Group

18. Availability Statement

19. Security Class (This Report) Unclassified

20. Security Class (This Page) Unclassified

21. No. of Pages 58

22. Price

(See ANSI-Z39.18) See Instructions on Reverse

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

All Shredder Residue (ASR) Issue Paper

Stakeholder Consultation Findings

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July
2011

Disclaimer

This document replaces the draft document titled “All Shredder Residue (ASR) Issue Paper: Opportunities for Collaboration. This document is the amended, final version of that draft document.

If you need this document in a format for the visually impaired, call the Hazardous Waste and Toxics Reduction Program at 360-407-6700. Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

Problem Statement and Purpose

All Shredder Residue (ASR) is the non-metallic remains from shredding automobiles and white goods for the purpose of separating them into marketable ferrous and non-ferrous metal. It is a high-volume waste stream. Across Washington, shredders generate over 500 tons of ASR daily. ASR contains bits of rubber, foam, plastic, and cloth contaminated with lead, cadmium, mercury, chrome, polychlorinated biphenyls (PCBs) and poly-brominated diphenyl ethers (PBDEs) phthalates, and other toxic constituents of concern.

Metal shredders generating ASR are responsible for the proper disposal of shredder residue. This includes sampling the material to determine if it is a hazardous waste. This requires a representative sample. Obtaining a representative sample of ASR is difficult due to:

- The variety of sizes and weights of the material in the ASR.
- The variety of feedstock that goes into the shredder.
- The volume of sample analyzed.

There is evidence indicating the current sampling method is insufficient[1]. A sample that is not representative cannot provide the information the Washington State Department of Ecology (Ecology) needs to make good regulatory decisions like using it as alternative daily cover or disposing at a hazardous waste facility. In this context, Ecology acknowledges that evaluating different sampling methodologies to determine if ASR is or is not a hazardous waste is not constructive at this time. It is equally important to acknowledge that because the current sampling approaches are not adequate, we need to work together in the absence of sufficient protocols to find a mutually agreeable solution to minimize toxic constituents in ASR.

To continue to spend industry and state resources on inadequate sampling is not in anyone's best interest. Ecology believes it is better to identify strategies for and overcome barriers to producing cleaner ASR and shredder sites. This approach also reduces the environmental risk to the metal shredders by providing a cleaner feedstock prior to shredding. Ultimately, this approach acknowledges the inherent difficulties of sampling ASR and examines actions that would lessen or eliminate the environmental concerns posed by ASR. Environmental concerns include:

- Contamination of stormwater by run off.
- Air deposition of contaminants.
- Fugitive emissions.
- Tracking contaminants off-site.

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[1] See Sample Representativeness in ASR, *ASTM D 5956 Sampling Guide for Sampling Strategies for Heterogeneous Wastes* and *Representativeness in an automobile shredder residue sample for a verification analysis*

Ecology intends to work collaboratively with all stakeholders to achieve cleaner ASR and shred facilities.

Overview of the Metal Recycling Market

Metal recyclers provide a valuable service and are important to local and international commerce. Metal is a valuable commodity, bought and sold locally and abroad. Additionally, vehicle and appliance recycling play a valuable part in waste reduction and recycling. Without the auto dismantling and shredding industries, our communities would be knee deep in car and appliance hulks. These industries have also responded to environmental challenges by improving their practices, operations, and facilities.

The metal recycling industry comprises various industry sectors including:

- Vehicle dismantlers who disassemble vehicles for parts and then recycle the vehicle hulks.
- Shredders who accept vehicle hulks and other metals for metal shredding.
- Intermediate Recyclers/Scrap Metal Processors who recycle metal, but are not solely vehicle dismantlers or shredders.
- Hulk haulers who primarily take vehicle hulks to shredders and intermediate recyclers.

It is also worth mentioning that the industry is changing. Recent changes include:

- A reduction in the number of auto dismantlers across the state.
- Consolidation in the dismantler industry.
- A move toward larger and more environmentally protective dismantlers.
- Vertical integration whereby shredders are purchasing dismantling facilities.

Market and Regulatory Context

When Ecology shifted its focus from sampling ASR to identifying how to remove or minimize the toxic components in the shredder feedstock, significant market details became apparent and will require the attention of Ecology and its stakeholders.

Feedstock Source and Inter-State Commerce Issues

Shredder feedstock includes vehicles, appliances, construction debris, ships, and industrial equipment. Feedstock sources can come from in and out of state. Shredders estimate that 80 percent of the feedstock into the shredder comes from vehicles and appliances. While Ecology may be able to affect change inside the state boundaries, Ecology will face challenges in how to affect out- of-state sources coming into the shredders from across the country and imported into the country.

For vehicles, AROW estimates that 60 percent of end-of-life vehicles come from out of state. Ecology has limited ability to influence out-of-state feedstock sources. Short of national legislation, acceptance requirements placed on in-state shredders, or regulations governing the proper dismantling of vehicles, appliances, and industrial equipment, improvements made only in Washington will have a limited affect on the quality of ASR.

Across the board, industry expressed concern that changes in one state could shift markets to out-of-state areas resulting in a loss of market share and jobs in Washington. To date the economics of this claim have not been tested in Washington, or in other jurisdictions with recently promulgated rules or programs, such as New Hampshire and New York and the province of British Columbia. A key question for those locations is, "Did the more stringent requirements result in market shifts or loss of jobs within those regions?"

Pressures and Constraints in the Metal Recycling Industry

The path to ASR represents a complex chain of commerce, from vehicle design to vehicle end-of-life, including numerous life-cycle phases such as:

- design and manufacturing
- use
- maintenance and repair
- dismantling
- recycling
- shredding
- smelting

For example, various sub-contractors supply different parts at the direction of the Original Equipment Manufacturers (OEMs). The OEMs may not know all of the hazardous constituents contained in each part supplied by the sub-contractor. This creates challenges for dismantlers and shredders who don't have an effective means for identifying toxic components. These components potentially contribute to the contaminants found in ASR.

The metal recycling industry is an interdependent system, where each sector depends on the other to meet supply and make a profit. For example, the steel industry needs the shredded metal supplied by metal shredders for use in their steel mills. The metal shredders need the vehicle dismantlers and intermediate recyclers to supply metal feedstock to the shredders. The dismantlers need the shredders to recycle the metal from the vehicle hulks they deliver.

Long-term solutions will require upstream design changes best undertaken by the automotive OEM sector. However, the most effective short-term, immediate actions will generally come from behavior change and Best Management Practices in the auto-recycling sector.

Downstream suppliers have little control over their upstream supply chain. For example, auto dismantlers and auto shredders alike have little control over the toxicity and non-recyclability of many car parts. The OEMs have the most influence on the toxic components in vehicles and in their recyclability. Similarly, shredders also have little control over the quality of vehicle hulks coming to them from auto recyclers.

Each stakeholder group noted that all groups must take responsibility for their respective part of the chain of commerce. For example, shredders need to work with dismantlers to ensure they understand and meet metal acceptance criteria; and Ecology needs to raise the compliance bar at low-performing dismantling facilities. See attachment: Lifecycle of Vehicles and Appliances.

Most stakeholders expressed a need to take responsibility for what they are able to influence. Some went so far as to express an interest in engaging in dialogue with other stakeholders (upstream and downstream) in an effort to explore the complex system changes needed to improve economic and environmental performance for all parties.

Key Environmental Concerns

Setting aside the debate of whether or not ASR is hazardous waste, it still contains toxic constituents that if not managed appropriately may impact the environment and health of those living adjacent to shredding facilities. The following discussion outlines some of the pathways through which these materials may enter the environment.

Air Deposition and Air Emissions

Metal shredding, especially at mega-shredders creates fine particulates that can become airborne and deposit on the ground, roofs, and other structures. In the report commissioned by California's Department of Toxic Substance Control (DTSC), "Deposition of Coarse Particles in Wilimington, California," Cahill purports that the size and concentration of fugitive iron particles are capable of causing health impacts to lungs. Industry contested this report, citing a poor sample design and not controlling for other contributing sources.

In response, DTSC commissioned a second study, one which better controlled for other sources. Simultaneously and independent of the DTSC report, the facility installed additional pollution control devices. The second study showed a tremendous reduction in particulates that the author attributed to the newly installed pollution control devices. This illustrates that good pollution control devices may reduce potential risks due to air deposition.

In response to growing concern in this region about the risk of air deposition, the Environmental Protection Agency (EPA) conducted a limited study at Seattle Iron and Metals. At the time of this writing, the data is not available from EPA. While this study and the California study aren't definitive, they illustrate a concern about the environmental risks. Several stakeholders expressed a need for site specific air deposition studies.

Air emissions refer to the particulates and emissions coming from a particular source without respect to the particles depositing onto the land or water. An engineer from the Southern California Air Quality District conducted petroleum hydrocarbon emissions testing at two metal shredding facilities and found they each emitted 500 pounds of volatile organic compounds a day. If such a facility were located in a non-attainment area, this number could trigger additional requirements. While this may seem like a lot, from the Air Quality Pollution Control perspective, the number isn't surprising, because three or four gas stations emit the equivalent to this number. What this does illustrate however, is that as population and industrial activities increase in the future, shredders may become more of a priority for local air pollution control districts.

Stormwater Run-Off

In 2009 and 2010, the City of Seattle Public Utilities investigated city-owned stormwater structures within the vicinity of one of the shredders and the rooftops of one facility. Data from this investigation showed elevated levels of copper, zinc, lead, mercury, polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PBCs). The City of Tacoma and the environmental community expressed concerns about stormwater run-off but do not have extensive site-specific data as Seattle Public Utilities.

Contaminant Track-out

Contaminant track out refers to off-site contamination from shredder sites to adjacent roadways from vehicles and equipment entering and then exiting shredder sites. Seattle Public Utilities and City of Tacoma, Environmental Services both expressed concerns regarding the ability to meet their Municipal Stormwater permit limits in the absence of stronger regulatory controls such as removal of key components (mercury switches, PCB capacitors etc…) and additional best management practices such as:

- Installing wheel wash stations.
- Installing roof drain filter socks where appropriate.
- Vacuuming sweeping on and off-site.
- Covering ASR piles.
- Wetting ASR piles.
- Limiting the size of ASR piles.
- Limiting the amount of time ASR accumulates on site.

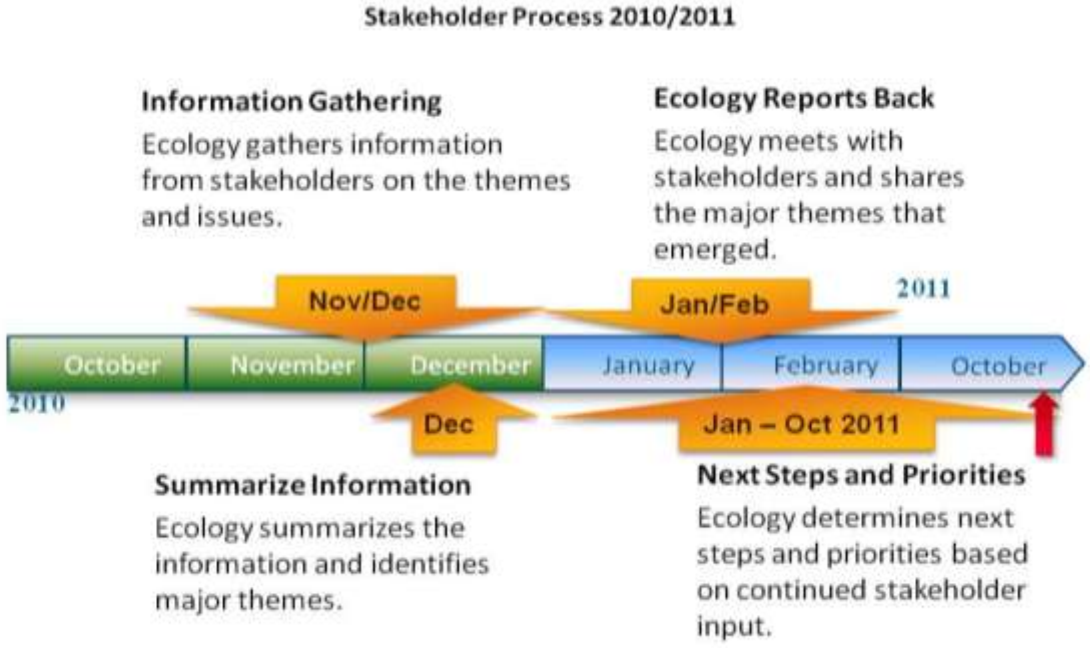
The Role of Product Stewardship

Product Stewardship or Extended Producer Responsibility is a policy and economic approach in which the product manufacturer has a key role in the design and end-of-life management of the product it produces. While this system has been in place in the European Union, Canada, and Japan for decades, it has only recently gained support in the United States.

Stakeholders contacted by Ecology generally supported reducing the use of toxic substances by the Original Equipment Manufacturers (OEMs) who design and manufacture vehicles and appliances. Stakeholders commented that OEMs need to play a role in reducing the toxic components used, and in sharing the burden of recycling and waste disposal. Washington has already seen successful, legislated Product Stewardship initiatives covering Electronics Take Back and Compact Fluorescent Lamps Collection.

Ecology's Hazardous Waste and Toxics Reduction Program (HWTR) recognizes the role Product Stewardship plays in minimizing the use of toxics, designing products with recyclability in mind, and in the product's end of life. We support these efforts by engaging the Environmental Protection Agency and the Northwest Product Stewardship Council. For the short term and this project, Ecology is not pursuing a Product Stewardship Initiative for vehicles or appliances.

Ecology's Stakeholder Process



Stakeholder Process 2010/2011

Information Gathering
Ecology gathers information from stakeholders on the themes and issues.

Ecology Reports Back
Ecology meets with stakeholders and shares the major themes that emerged.

Summarize Information
Ecology summarizes the information and identifies major themes.

Next Steps and Priorities
Ecology determines next steps and priorities based on continued stakeholder input.

In November 2010, Ecology invited comment from:

- Metal shredding facilities that generate ASR.
- Vehicle dismantlers that supply the shredding facilities.
- Steel manufactures that buy metal from the shredders.
- Local regulatory agencies.
- Environmental and community groups with concerns about the environmental effects of ASR.

A complete list of participants is available in the Attachments.

What Were the Goals of this Process?

The goals of this process include:

- Understanding the barriers to producing cleaner shred.
- Developing an issue paper with stakeholders.
- Creating and establishing positive communication among all stakeholders.

The statements below reflect views of the participants. Some of these issues lay out necessary components of successful solutions, some describe key challenges, and yet others simply clarify some of the detailed, complicated nuances of this topic. We grouped comments into categories, but acknowledge not all fit neatly into one category.

- Level Playing Field/Economic Realties
- Regulatory
- Environmental
- Incentives

Level Playing Field/Economic Realities

- There are slim margins within the metal recycling industry.
- Stiff competition exists among metal recyclers.
- There are hundreds of metal recyclers in Washington State that do not shred or dismantle. These intermediate recyclers receive less regulatory scrutiny than shredders or vehicle recyclers.
- Hulk haulers and crushers do not receive a lot of regulatory scrutiny.
- The bulk of metal supply comes from Oregon, Idaho, Alaska, Canada, and Washington. To prevent cross-border flight, changes must be made throughout the Northwest region.

- Customers will go down the street if acceptance protocols at shredders are too stringent.
- There are contributors to the shred waste stream other than the auto recycling industry, such as white goods and appliances. Policy or rule changes cannot overlook these contributions**.**

Regulatory

- Intermediate and small dismantling facilities have an inconsistent track record in removing materials of concern and properly preparing car hulks.
- There is a need for clear requirements for removing known toxic components (Mercury (Hg) switches, lead wheel weights, and fluids), and enforcement of those requirements.
- Ecology must clearly define success and compliance. Industry needs to know what materials are of concern, at what level, and as determined by what tests. Without such clarification, it will be hard to demonstrate improvement or success against a certain baseline.
- If laws prohibit shredders from handling certain materials, (parts, etc.) then rules must be established for the proper processing of those materials; otherwise, there is a risk of illegal dumping.
- If there is a requirement to remove something, the material of concern must have a disposal route.
- If there is no market value for an item, then it is difficult to remove the item without added expense.

Environmental

- Washington shredders generate over 400 tons of ASR daily; landfills use nearly all of this as alternative daily cover.
- Appliances contribute to the toxic loading but there has been less attention on appliances and appliance de-manufacturing.
- Shredding facilities have a limited understanding of the complexity of sampling issues.
- There is concern that metal shredders are a source of air deposition of toxic metals.
- There is concern of off-site contamination through track out from shredding facilities.

Incentives

- Most stakeholders believed incentives would facilitate removal of additional items.
- Two stakeholders commented that the mercury switch program had little or no effect on the incoming feedstock.
- Stakeholders supported the mercury switch removal program.
- Stakeholders commented that the three-dollar rebate did not account for all of the labor costs of removal.

Potential Next Steps

The following section moves beyond the issues and themes identified above, and begins to lay out actions stakeholders suggested for moving toward the goals of minimizing toxicity of shred and shredder sites. We broke out the potential solutions into three broad categories:

1. Policy & Legislative
2. Research
3. On-site Operations

Some identified approaches will likely require long-term upstream actions, such as taking toxics out of vehicles through design. Other actions will require downstream or on-site-specific actions, such as removing toxic components. Stakeholders offered the following suggestions and concepts to meet the goal of cleaner shred and cleaner shred sites:

Policy or Legislative Changes

(These could be done in concert with work being undertaken by the Environmental Protection Agency (EPA) Automobile Product Stewardship Road Map process.)

- Evaluate opportunities for a more comprehensive and effective end-of-life vehicle regulatory system.
- Identify U.S. regulations that address automobiles, and evaluate differences between states.
- Undertake a Gap Analysis comparing the U.S. Regulatory Landscape with the European and Japanese End of Life Vehicle (ELV) legislation. Identify trends in vehicle design, materials, and new technologies. Evaluate how such trends could interface with Washington regulations and programs (including safety vs. environment issues).
- Identify opportunities for tax incentives, particularly around transportation, as well as incentives through changes in the insurance industry with respect to end of life vehicles.

- Expand the use of incentives: e.g., bounties, buy-back, core charges, deposits, tax/fee structures, small business loans.
- Leverage and use the International Dismantling Information System (IDIS) in a manner identified by vehicle recyclers.
- Develop a vehicle recycler certification and enforcement system that establishes industry best management practices and assures compliance through government oversight and industry requirements. (For example, shredders could be required to accept only metal from certified vehicle recyclers.)

Research

- Conduct investigative sampling to determine the most appropriate sample size and/or to establish a baseline allowing measurement of reductions in toxics over time.
- Identify additional data needs and gaps with regard to air deposition, storm water run-off, toxic loading, and landfill cover. Prioritize the research needs. Develop approaches to gather prioritized data.
- Careful documentation of the amount of targeted materials removed per vehicle to establish metrics (e.g., gallons of specific fluids, pounds of CFC's, number of Hg switches, air bag detonators, etc.).

On-site Operations

- Expand the practice of vacuum sweeping on- and off-site at shredding facilities.
- Expand the practice and extent of covering shred piles.
- Install filters on downspouts.
- Establish more protective acceptance policies and verification programs at both dismantler and shredders sites. (Note, this has illegal dumping implications.)
- Increase downstream separation process to remove more metals.
- Identify the top ten items Ecology wants removed.
- Expand use of enviro-racks to remove additional parts and materials of concern from vehicle hulks.
- Develop a pilot project to target a specific issue whose resolution could facilitate both cleaner shred and market development of additional recyclable materials (e.g., increased recycling and local processing of bumper skins, or window glass).
- Leverage and use the International Dismantling Information System (IDIS) in a manner identified by vehicle recyclers.

Where Do We Go From Here?

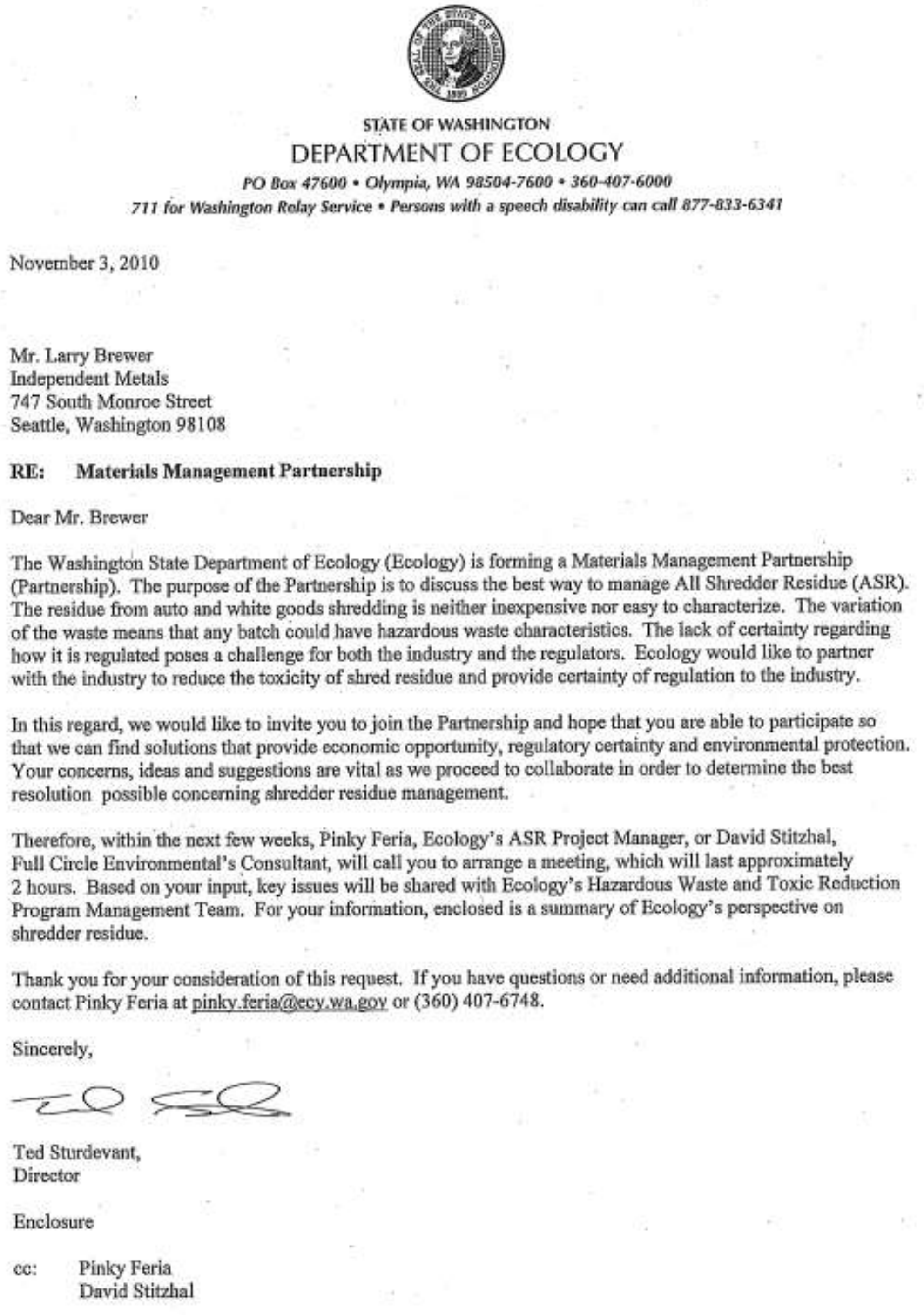
Having completed this Issue Paper, Ecology will use what we learned, in concert with continued Stakeholder Discussions, to develop specific, targeted actions to achieve cleaner ASR and shredder sites. Such actions will be agreed to by key stakeholders, and a detailed implementation plan will be developed to define next steps.

Attachments

- Participant list
- Invitation letters (4) and brief sheet
- Lifecycle of Vehicles and Appliances

Attachments

All Shredder Residue Particpants			
Last Name	**First**	**Title**	**Company**
Smith	Gary	Executive Director	Automotive Recyclers of Washington (AROW)
Rose	Leslie Ann	Senior Policy Analyst	Citizens for a Healthy Bay
Oberlander	Jim	Stormwater, Source Control Supervisor	City of Tacoma, Environmental Services
Rasmussen	James	Coordinator	Duwamish River Cleanup Coalition
Burrell	Kevin	Executive Director	Environmental Coalition of South Seattle
Brewer	Larry	Operations Manager	Independent Metals
Hileman	Frank	Environmental Liaison	AROW, LKQ
Person	Matt	Government Affairs Representative	AROW, LKQ
Balogh	Kathy	Environmental Specialist	MetroMetals/Pacific Coast Shredding
Vail	Mike	Vice President	MetroMetals/Pacific Coast Shredding
Adams	Jeremy	Environmental Engineer	NUCOR
Kale	Bart	Environmental Health & Safety	NUCOR
Trim	Heather	Urban Bays & Toxics Program Manager	People for Puget Sound
Kinn	Katelyn	Pollution Prevention & Legal Affairs Coordinator	Puget Sound Keeper Alliance
Thompson	Bruce	Environmental Liaison AROW, owner/operator	AROW, Pull-a-Part
Coope	Jason	National Director R&D	Schnitzer Steel
Enquist	Eric	General Manager	Schnitzer Steel
Grimm	Brian	NW Facility Manager	Schnitzer Steel
Marcelynas	Andy	Plant Manager	Schnitzer Steel
Parker	Matt	Regional Director	Schnitzer Steel
Sloan	Scott	NW Regional Environmental Manager	Schnitzer Steel
Goodell	Jack	AROW, Treasurer	Schulls Towing & Parts
Armstrong	Ed	Maintenance Manager	Seattle Iron & Metals
Franklin	John	Stormwater & Environmental Manager	Seattle Iron & Metals
Priest	Brett	Operations Manager	Seattle Iron & Metals
Sidell	Alan	President	Seattle Iron & Metals
Sidell	Marc	Vice President	Seattle Iron & Metals
Schmoyer	Beth	Supervisor, Stormwater	Seattle Public Utilities
Comstock	Andy	Environmental Health Specialist	Tacoma-Pierce County Health Department
Sherman	John	Environmental Health Liaison	Tacoma-Pierce County Health Department
Plotkin	Norm	Consultant	Plotkin and Zin, Consultant to LKQ



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

November 3, 2010

Mr. Larry Brewer
Independent Metals
747 South Monroe Street
Seattle, Washington 98108

RE: Materials Management Partnership

Dear Mr. Brewer

The Washington State Department of Ecology (Ecology) is forming a Materials Management Partnership (Partnership). The purpose of the Partnership is to discuss the best way to manage All Shredder Residue (ASR). The residue from auto and white goods shredding is neither inexpensive nor easy to characterize. The variation of the waste means that any batch could have hazardous waste characteristics. The lack of certainty regarding how it is regulated poses a challenge for both the industry and the regulators. Ecology would like to partner with the industry to reduce the toxicity of shred residue and provide certainty of regulation to the industry.

In this regard, we would like to invite you to join the Partnership and hope that you are able to participate so that we can find solutions that provide economic opportunity, regulatory certainty and environmental protection. Your concerns, ideas and suggestions are vital as we proceed to collaborate in order to determine the best resolution possible concerning shredder residue management.

Therefore, within the next few weeks, Pinky Feria, Ecology's ASR Project Manager, or David Stitzhal, Full Circle Environmental's Consultant, will call you to arrange a meeting, which will last approximately 2 hours. Based on your input, key issues will be shared with Ecology's Hazardous Waste and Toxic Reduction Program Management Team. For your information, enclosed is a summary of Ecology's perspective on shredder residue.

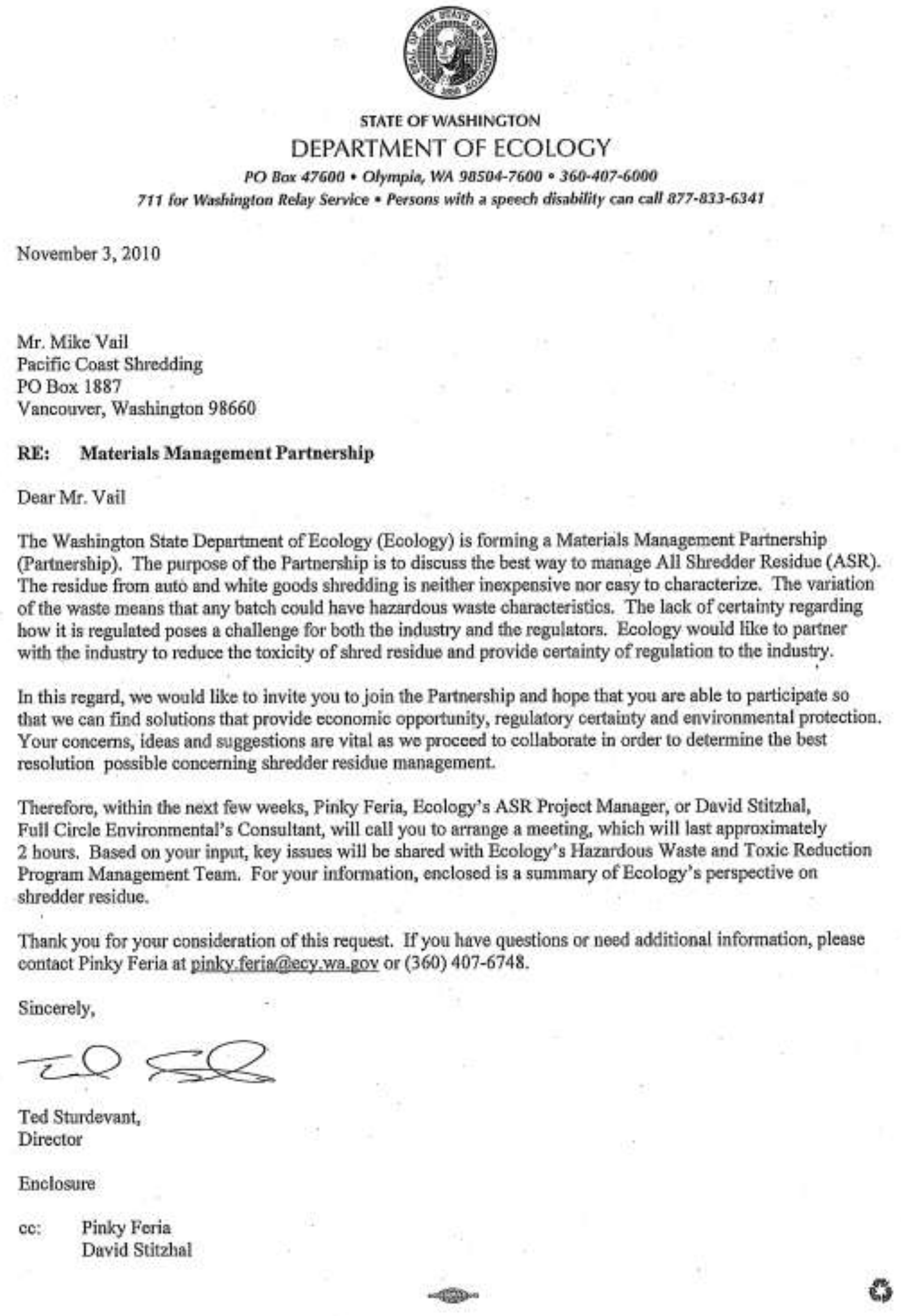
Thank you for your consideration of this request. If you have questions or need additional information, please contact Pinky Feria at pinky.feria@ecy.wa.gov or (360) 407-6748.

Sincerely,

Ted Sturdevant,
Director

Enclosure

cc: Pinky Feria
David Stitzhal



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November 3, 2010

Mr. Mike Vail
Pacific Coast Shredding
PO Box 1887
Vancouver, Washington 98660

RE: Materials Management Partnership

Dear Mr. Vail

The Washington State Department of Ecology (Ecology) is forming a Materials Management Partnership (Partnership). The purpose of the Partnership is to discuss the best way to manage All Shredder Residue (ASR). The residue from auto and white goods shredding is neither inexpensive nor easy to characterize. The variation of the waste means that any batch could have hazardous waste characteristics. The lack of certainty regarding how it is regulated poses a challenge for both the industry and the regulators. Ecology would like to partner with the industry to reduce the toxicity of shred residue and provide certainty of regulation to the industry.

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Sincerely,

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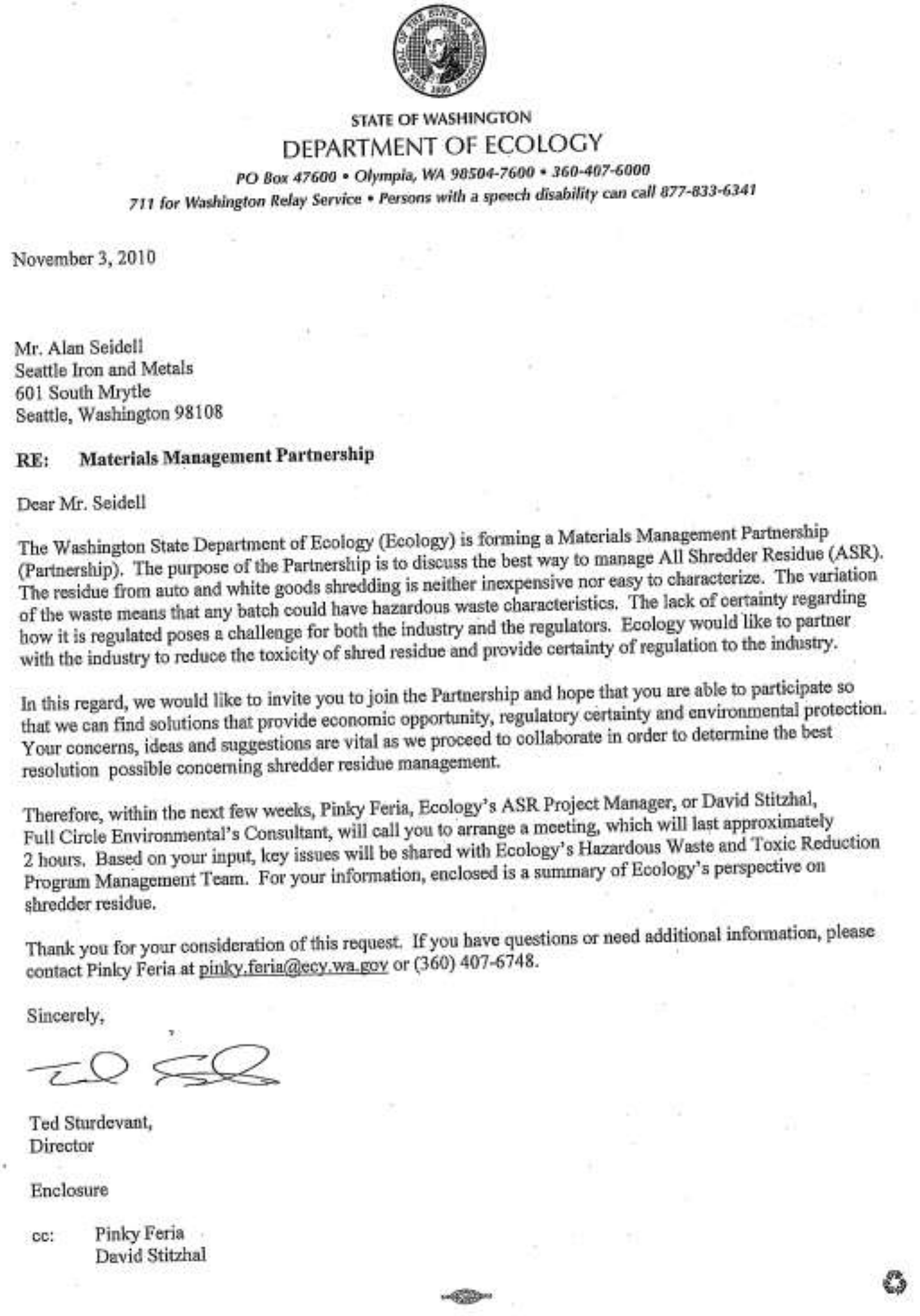

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November 3, 2010

Mr. Alan Seidell
Seattle Iron and Metals
601 South Mrytle
Seattle, Washington 98108

RE: Materials Management Partnership

Dear Mr. Seidell

The Washington State Department of Ecology (Ecology) is forming a Materials Management Partnership (Partnership). The purpose of the Partnership is to discuss the best way to manage All Shredder Residue (ASR). The residue from auto and white goods shredding is neither inexpensive nor easy to characterize. The variation of the waste means that any batch could have hazardous waste characteristics. The lack of certainty regarding how it is regulated poses a challenge for both the industry and the regulators. Ecology would like to partner with the industry to reduce the toxicity of shred residue and provide certainty of regulation to the industry.

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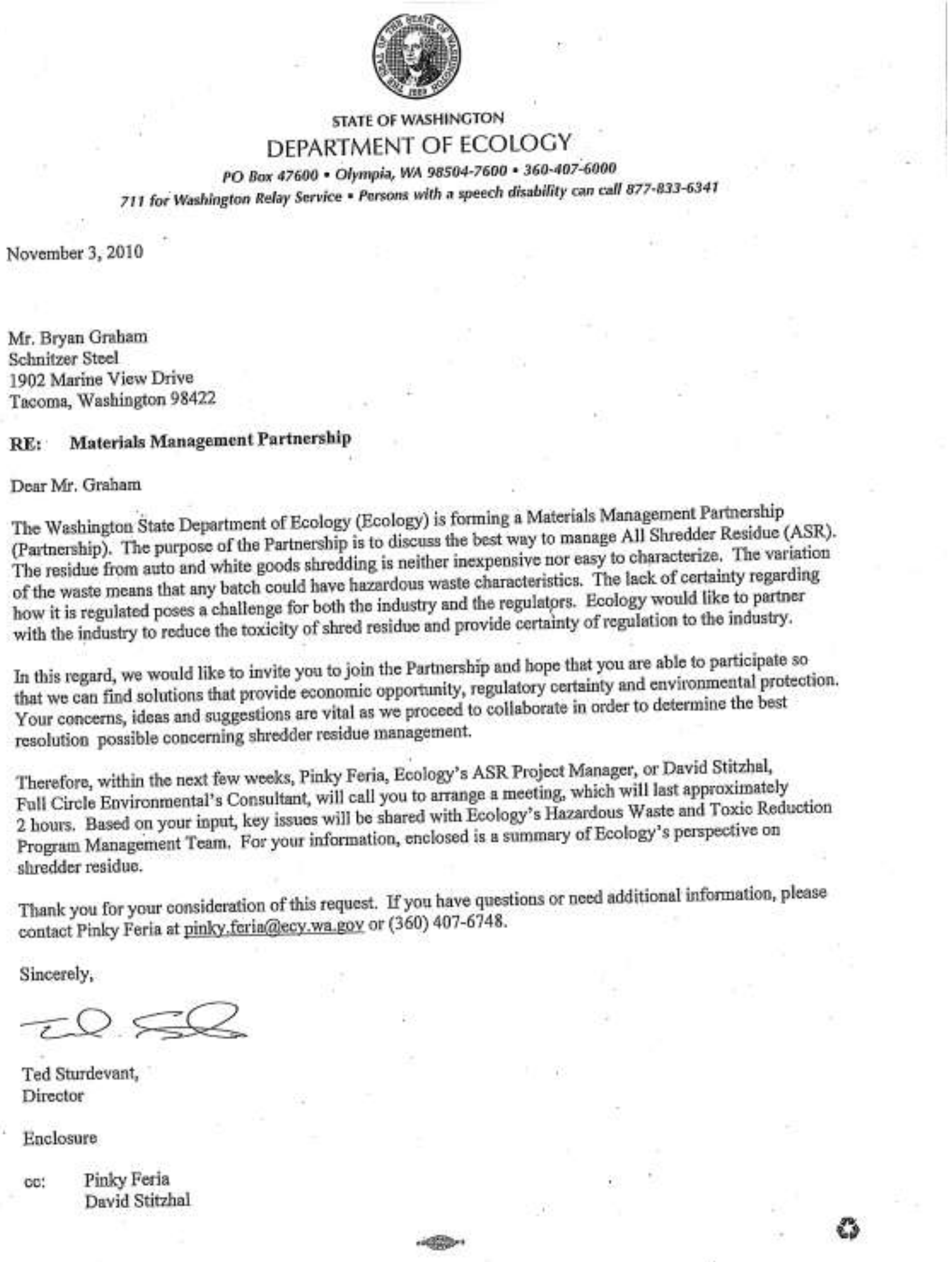
Sincerely,

Ted Sturdevant,
Director

Enclosure

cc: Pinky Feria
David Stitzhal



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November 3, 2010

Mr. Bryan Graham
Schnitzer Steel
1902 Marine View Drive
Tacoma, Washington 98422

RE: Materials Management Partnership

Dear Mr. Graham

The Washington State Department of Ecology (Ecology) is forming a Materials Management Partnership (Partnership). The purpose of the Partnership is to discuss the best way to manage All Shredder Residue (ASR). The residue from auto and white goods shredding is neither inexpensive nor easy to characterize. The variation of the waste means that any batch could have hazardous waste characteristics. The lack of certainty regarding how it is regulated poses a challenge for both the industry and the regulators. Ecology would like to partner with the industry to reduce the toxicity of shred residue and provide certainty of regulation to the industry.

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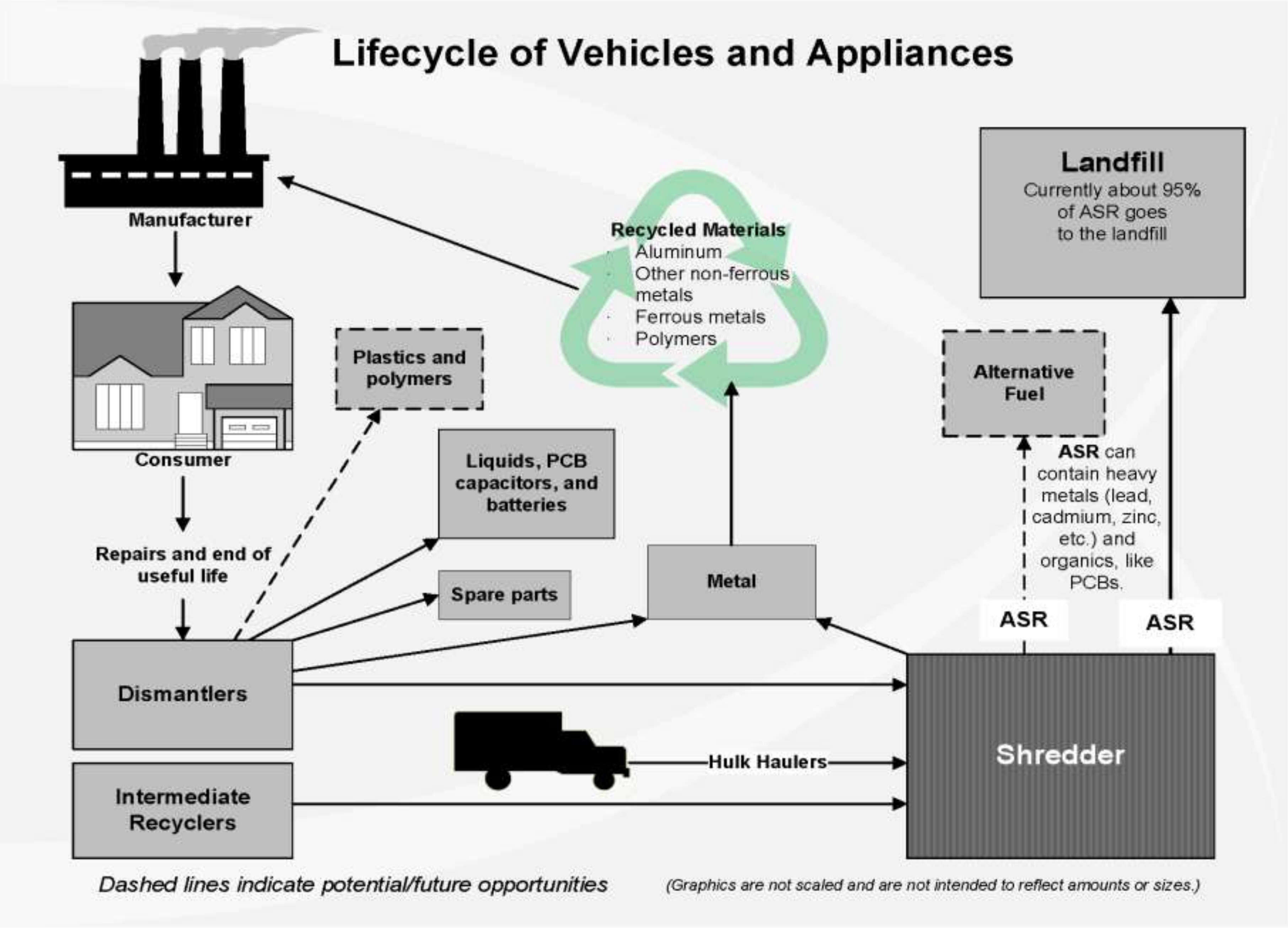
Sincerely,

Ted Sturdevant,
Director

Enclosure

cc: Pinky Feria
David Stitzhal



Dashed lines indicate potential/future opportunities

(Graphics are not scaled and are not intended to reflect amounts or sizes.)

Lockhart, John V <john.v.lockhart@wv.gov>

Auto shredder non ferrous separation

9 messages

Lockhart, John V <john.v.lockhart@wv.gov> Wed, May 1, 2024 at 11:05 AM
To: Michael P Hofe <michael.p.hofe@wv.gov>

[Quoted text hidden]

Sizemore, Joe M <joe.m.sizemore@wv.gov> Thu, Apr 25, 2024 at 2:02 PM
To: "Lockhart, John V" <john.v.lockhart@wv.gov>
Cc: "Morris, Gregory C" <gregory.c.morris@wv.gov>, Bassam Y Makar <bassam.y.makar@wv.gov>, Brad M Wright <brad.m.wright@wv.gov>, Tonya A Mather <Tonya.A.Mather@wv.gov>, "Killian, John D" <john.d.killian@wv.gov>, "Smith, Matthew T" <matthew.t.smith@wv.gov>, "Lawson, Travis T" <travis.t.lawson@wv.gov>

I flipped through some of those documents really quickly. The sampling procedure looks complicated, but I reckon that is the hang up with this material. It's very difficult to get a representative sample. Joe.

[Quoted text hidden]

Makar, Bassam Y <bassam.y.makar@wv.gov> Thu, Apr 25, 2024 at 2:01 PM
To: "Lockhart, John V" <john.v.lockhart@wv.gov>
Cc: "Morris, Gregory C" <gregory.c.morris@wv.gov>, "Sizemore, Joe M" <joe.m.sizemore@wv.gov>, Brad M Wright <brad.m.wright@wv.gov>, Tonya A Mather <Tonya.A.Mather@wv.gov>, "Killian, John D" <john.d.killian@wv.gov>, "Smith, Matthew T" <matthew.t.smith@wv.gov>, "Lawson, Travis T" <travis.t.lawson@wv.gov>

The permit that was issued for Copper Ridge was number 21-03-12 for the generator West Virginia Recycling expired on March 5, 2023.

Thank you,

Bassam Makar

WV DEP-Division of Water & Waste Mgt.

601 57th St. SE

Charleston, WV 25304-2345

Phone: (304) 926-0499 EXT 43851

Fax: (304) 926-0496

Cell: 304-550-9077

[Quoted text hidden]

Lockhart, John V <john.v.lockhart@wv.gov> Thu, Apr 25, 2024 at 1:41 PM
To: "Morris, Gregory C" <gregory.c.morris@wv.gov>
Cc: "Sizemore, Joe M" <joe.m.sizemore@wv.gov>, Bassam Y Makar <bassam.y.makar@wv.gov>, Brad M Wright <brad.m.wright@wv.gov>, Tonya A Mather <Tonya.A.Mather@wv.gov>, "Killian, John D" <john.d.killian@wv.gov>, "Smith, Matthew T" <matthew.t.smith@wv.gov>, "Lawson, Travis T" <travis.t.lawson@wv.gov>

....and CR's approval expired in 2023..so future approval needs to go through Bassam and Special Waste for future disposal...

John

[Quoted text hidden]

Morris, Gregory C <gregory.c.morris@wv.gov> Thu, Apr 25, 2024 at 1:29 PM
To: "Sizemore, Joe M" <joe.m.sizemore@wv.gov>
Cc: "Lockhart, John V" <john.v.lockhart@wv.gov>, Bassam Y Makar <bassam.y.makar@wv.gov>, Brad M Wright <brad.m.wright@wv.gov>, Tonya A Mather <Tonya.A.Mather@wv.gov>, "Killian, John D" <john.d.killian@wv.gov>, "Smith, Matthew T" <matthew.t.smith@wv.gov>, "Lawson, Travis T" <travis.t.lawson@wv.gov>

WW SE is happy to engage with HW folks on this one. Our landfill of concern is Copper Ridge in Welch. They are bringing in **a lot** of fluff. Given the amount of material, I think it's worth investigating.

On Thu, Apr 25, 2024 at 10:36 AM Sizemore, Joe M <joe.m.sizemore@wv.gov> wrote:
[Quoted text hidden]

Makar, Bassam Y <bassam.y.makar@wv.gov> Thu, Apr 25, 2024 at 10:44 AM
To: "Sizemore, Joe M" <joe.m.sizemore@wv.gov>
Cc: "Lockhart, John V" <john.v.lockhart@wv.gov>, Gregory C Morris <gregory.c.morris@wv.gov>, Brad M Wright <brad.m.wright@wv.gov>, Tonya A Mather <Tonya.A.Mather@wv.gov>, "Killian, John D" <john.d.killian@wv.gov>, "Smith, Matthew T" <matthew.t.smith@wv.gov>, "Lawson, Travis T" <travis.t.lawson@wv.gov>

I have just collected their lab results, the fresh one that would cover TCLP Metals, PCBs, and PH and processed their needs for extra tonnage.

Thank you,

Bassam Makar

WV DEP-Division of Water & Waste Mgt.

601 57th St. SE

Charleston, WV 25304-2345

Phone: (304) 926-0499 EXT 43851

Fax: (304) 926-0496

Cell: 304-550-9077

[Quoted text hidden]

Sizemore, Joe M <joe.m.sizemore@wv.gov> Thu, Apr 25, 2024 at 10:35 AM
To: "Lockhart, John V" <john.v.lockhart@wv.gov>
Cc: Bassam Y Makar <bassam.y.makar@wv.gov>, Gregory C Morris <gregory.c.morris@wv.gov>, Brad M Wright <brad.m.wright@wv.gov>, Tonya A Mather <Tonya.A.Mather@wv.gov>, "Killian, John D" <john.d.killian@wv.gov>, "Smith, Matthew T" <matthew.t.smith@wv.gov>, "Lawson, Travis T" <travis.t.lawson@wv.gov>

I copied Brad, Greg and some HW staff here. Greg contacted me the other day about this. Shredder fluff was a topic on a recent call I was on and made me aware of the potential issues associated with this waste stream. The upshot is, it is an extremely tough waste stream to characterize properly (for a couple of different reasons) and it can contain PCBs, lead and cadmium among other toxic compounds.

Here is a folder with some information. I have contacts in other states that will collaborate on this if we feel we need to reach out for additional information.

The HW crew can help if you all would like to have some kind of sampling event. I've also copied Tonya Mather. I think she may have had some shredder fluff concerns here recently. I may be imagining that...

Thanks. Joe.

[Quoted text hidden]

Lockhart, John V <john.v.lockhart@wv.gov> Thu, Apr 25, 2024 at 8:31 AM
To: Joe M Sizemore <joe.m.sizemore@wv.gov>
Cc: Bassam Y Makar <bassam.y.makar@wv.gov>

Joe,

Anything extra we should ask for on the sampling protocol?

John
[Quoted text hidden]

Makar, Bassam Y <bassam.y.makar@wv.gov> Thu, Apr 25, 2024 at 8:20 AM
To: John V Lockhart <john.v.lockhart@wv.gov>

John,

For your information, Short Creek requested for AMG Resources the generator to increase annual tonnage approved for 23-04-06 of 24,000 ton/Year of Auto shredder non ferrous separation to be 32,000 tons. They are supposed to submit by the anniversary of April 5, 2024 the lab results. I suspended their request till they submit the fresh lab required.

Thank you,

Bassam Makar

WV DEP-Division of Water & Waste Mgt.

601 57th St. SE

Charleston, WV 25304-2345

Phone: (304) 926-0499 EXT 43851

Fax: (304) 926-0496

Cell: 304-550-9077

west virginia department of environmental protection

Division of Water and Waste Management
601 57th Street SE
Charleston, WV 25304
Phone: (304) 926-0465
Fax: (304) 926-0456

Harold D. Ward, Cabinet Secretary
dep.wv.gov

Minor Permit Modification for Disposal of Petroleum-Contaminated Material

SWPU ID: 25-05-49

Landfill: Short Creek

Generator: AMG Resources Corp.

Request Received: May 29, 2025

Request Dated: May 29, 2025

Waste: Auto Shredder & Nonferrous Separation

Generated at: Benwood, WV

Comments and/or Conditions

The following checked (X) comments and/or conditions apply:

1. ☒ The West Virginia Department of Environmental Protection, Office of Solid Waste, has reviewed the information submitted by Short Creek Landfill. Based upon this information, the WVDEP believes that this waste is excluded from regulation as hazardous waste under the Resource Conservation and Recovery Act. Consequently, a minor permit modification is granted for the disposal of this waste at Short Creek Landfill.

2. ☒ Quantity Approved: 32,000 Ton/Year

   ☐ This quantity approved is an increase of the amount allowed by the Minor Permit Modification: granted:

3. ☒ This amount may be received before: May 29, 2027

   ☐ The above date represents an extension of the time allow by the Minor Permit Modification: granted:

4. ☒ Approved for disposal:

   ☒ TPH (GRO + DRO + ORO) > 10,000 mg.kg: This waste must be aerated over an unused lined portion of the landfill until test results are obtained showing that TPH (GRO + DRO + ORO) is less than 10,000 mg/kg, TOVs are less than 100 ppm, and if

DRO is present at more than 100 mg/kg, until total PAH is less than 100 mg/kg, and then disposed of within 30 days of obtaining those test results.

☐ TPH (.....) < 10,000 mg/kg:

a. DRO > 100 mg/kg and/or TOVs > 100 ppm: This waste must be aerated over an unused lined portion of the landfill until test results are obtained showing that, as applicable, total PAH is less than 100 mg/kg and TOVs are less than 100 ppm, and then disposed of within 30 days of obtaining those test results.

b. DRO < 100 mg/kg and TOVs < 100 ppm: This waste must be disposed of within 30 days of receiving the waste or this minor permit modification, whichever is later.

5. ☐ Approved for use as daily cover or disposal:

☐ TPH (.....) > 5,000 mg/kg: This waste must be aerated over an unused lined portion of the landfill until test results are obtained showing that TPH (.....) is less than 5,000 mg/kg, TOVs are less than 100 ppm, and if DRO is present at more than 100 mg/kg, until total PAH is less than 100 mg/kg, and then used as daily cover or disposed of within 30 days of obtaining those test results.

☐ TPH (.....) < 5,000 mg/kg:

a. DRO > 100 mg/kg and/or TOVs > 100 ppm: This waste must be aerated over an unused lined portion of the landfill until test results are obtained showing that, as applicable, total PAH is less than 100 mg/kg and TOVs are less than 100 ppm, and then disposed of within 30 days of obtaining those test results.

b. DRO < 100 mg/kg and TOVs < 100 ppm: This waste must be used as daily cover or disposed of within 30 days of receiving the waste or this minor permit modification, whichever is later.

6. ☐ After a minimum of thirty days of aeration, this waste must be tested for and the analytical results submitted to this office for review before disposal.

7. ☒ Petroleum contaminated materials that <u>are not used</u> as daily cover <u>shall be included</u> in monthly tonnage calculations.

8. ☒ Petroleum contaminated materials (PCM) that are used as daily cover may be excluded from monthly tonnage calculations, provided that all of the following conditions are met:

a. Daily deposition of solid waste is confined to as small an area as practical in accordance with the Solid Waste Management Rule, 33 C.S.R. 1-4.6.a.1.A.

b. Calculations for the amount to be used as daily cover and exempted from the tonnage limits shall be based on an eight foot (8') vertical cell height for solid waste disposed of daily.

c. Under no circumstances, shall the amount of PCM used as daily cover and exempted from monthly tonnage calculations, exceed the rate of 0.14 tons per one (1) ton of solid waste.

d. Example: A facility that receives 200 tons per day of solid waste, including PCM that is suitable for use as daily cover, shall not exceed 28 tons per day for tonnage exemption.

Required formula for calculation:

0.14 x tons of solid waste per day = tons of cover material permitted per day.

9. ☒ The disposal or use as daily cover of this waste must take place during normal working hours, will not be exempt from assessment fees, and must be included in the monthly tonnage report.

10. ☒ Free liquids received by the landfill cannot be disposed of in the landfill. Free liquids and poorly contained liquids must be absorbed on solid material before being placed in the disposal cell. A Paint Filter Liquid Test (Method 9095) as described in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: (EPA Pub. No. SW-846), must be performed on <u>each load</u> of waste after solidification and results maintained on site at all times with the special waste permit for review by West Virginia Department of Environmental Protection (DEP_ personnel. A summary of this data must be submitted to the DEP every six (6) months from the issuance date of this permit, for the life of the permit.

11. ☒ Additional comments and/or conditions: In lieu of aeration, Short Creek Landfill shall excavate a pit in the active working disposal area. The contaminated material shall be placed in the pit and covered immediately upon disposal. Every year by the anniversary date of this Minor Permit Modification, Short Creek Landfill shall submit laboratory results for a sample representative of the waste, recently collected by AMG Resources Corp., and analyzed by EPA-approved methods for:TCLP VOC's, SVOC's, Metals, TPH-GRO, ORO, DRO, Percentage of Solids, PCBs, & PH

12. ☒ The landfill must maintain monthly storage capacity to accommodate the disposal of municipal solid waste as per the facility's Certificate of Necessity. This Permit in no way allows the landfill to guarantee space or accept waste from the waste generator if the guarantee or acceptance of the waste will be likely to create an excess in monthly tonnage.

13. ☒ If you have questions or need additional information, please contact Bassam Makar at (304) 926-0499, extension 43851 or Bassam.Y.Makar@wv.gov

<u>Minor Permit Modification is Granted:</u>

______________________________ <u>May 30, 2025</u>

Jeremy W. Bandy Date

Director

Special Waste
Information Submission or
Request to Revise Minor Permit Modification

To expedite handling, please use this form when submitting information required by a minor permit modification or requesting that a minor permit modification be revised.

Instructions:
Complete the necessary information below.
Include a copy of the entire permit modification.
Include other documents, if necessary.
Assemble documents with this page on top.
Submit to the Solid Waste Permitting Unit.

SWPU ID Number (25-03-15) LF SWF 1034 Short Creek

Required periodic analyses are enclosed herewith.
Required certification of nonhazardous status is enclosed herewith
Increase amount to
Extend time to accept waste to
Other: AMG ASR submittal current approval expires 5/31/25

~~Date: April 2018~~ Signed: Barb Harsanye, Mfg & Env Services
5/29/25 Short Creek Landfill

West Virginia DEP Waste Characterization Form

[For DEP use. SWPU ID: ______________]

Generator: Complete Parts A through G. Do not leave any blanks. Enter **N/A** for every item that is "not applicable." Submit with supporting documents to the landfill that will accept the waste. Please do not include a cover letter except to explain something not covered by the Waste Characterization Form. IDs are for the Generator's convenience and are optional. E-mail addresses are preferred but optional.

A. Responsible Parties

Landfill's ID: ______________

Generator: AMG RESOURCES CORP.
Generator's ID: ______________
Contact Person: GREG OSWALD
Telephone: 330-447-7902
Address: 66 35TH ST.
City, State, Zip: WHEELING WV 26003
E-mail: goswald@amgresources.com

Transporter: SAME AS ABOVE:
Transporter's ID: ______________
Contact Person: ______________
Telephone: ______________
Address: ______________
City, State, Zip: ______________
E-mail: ______________

Contractor: ______________
Contractor's ID: ______________
Contact Person: ______________
Telephone: ______________
Address: ______________
City, State, Zip: ______________
E-mail: ______________

Laboratory: PACE NATIONAL
Laboratory ID: 233
Contact Person: HEATHER WAGNER
Telephone: 615-773-9686
Address: 12065 LEBANON RD.
City, State, Zip: NASHVILLE TN 37122
E-mail: heather.wagner@pacelabs.com.

B. Waste Description

Type of special waste according to 33 CSR § 1-4.13 (Circle all that apply; if none apply, make no response):

- Petroleum-contaminated soil
- Bulky Goods
- Asbestos Wastes
- Infectious Waste
- Liquids
- Sewage Sludge
- Tires
- [✓ Automobile Shredder Fluff]
- Drums
- Municipal Incinerator Ash

Anticipated total weight as delivered to landfill (tons): 64,000 Over what length of time? 24 MONTHS

Detailed description of the process that generated this waste:

AUTO SHEDDER AND NONFERROUS SEPERATION.

C. Hazardous Potential

All questions in Section C apply to all wastes. Answer "Yes" or "No." Leave no blanks and do not enter N/A.

According to 40 C.F.R. is this: A characteristic hazardous waste: NO A listed hazardous waste: NO

An exempt or excluded HW: NO Prohibited by Land Disposal Restrictions of 40 C.F.R. § 268: NO

Does this waste contain: PCBs: YES SEE ENCLOSED REPORT Dioxins: NO Radioactive material: NO *

* If "NO", waste material must be less than 10μR/hr above background(drill cuttings and associated waste and completion and production waste only)

D. General Characteristics

List the constituents of this waste present at more than about 1% by weight. Use generic names, not trade names. Weight percents may be by generator knowledge, lab tests, or MSDS.

Constituent	Wt. %	Constituent	Wt. %	Constituent	Wt. %
FOAM/FABRIC/PLASTIC	65%	GLASS	5%		
WOOD/PAPER	5%	METALLICS	5%		
DIRT/SOIL	20%				

List the constituents present at less than about 1% by weight: N/A

Consistency at 70°F and 1 atmosphere (circle): [✓ solid] paste slush slurry liquid gas

Percent solids by weight: 100% Determined visually? YES Or by test (specify): ______

Color (shade & hue): MEDIUM, BROWN Odor (intensity & type): SLIGHTLY MUSTY

E. Petroleum Contaminated Soil:

Maximum mg/kg: GRO N/A DRO N/A ORO N/A BTEX N/A Benzene N/A

F. Miscellaneous: Have you attached a photograph, sketch, or map of the site at the time of sampling with sample locations marked? NO, MAP IS ON FILE.

Place where the waste was generated (city, intersection, mile marker, etc.): BENWOOD, WV

Additional comments: ______

G. Documents Enclosed (check all that apply)

MSDS ______ Chain of Custody X Lab Certification of Results X Lab Report ______ Photo X

Analytical Summary: X Report ______ Map ______ Other (specify) ______

H. Generator Certification

I am legally authorized to represent the Generator. All information presented in this characterization is the result of (1) my knowledge of this waste or (2) laboratory analysis of a representative sample or samples by an EPA method or methods.

I hereby certify that the information supplied on this form and attached to it is complete and accurate, that no negligent or willful omissions of waste characteristics have been made, and that all known or suspected hazards have been disclosed.

Generator's authorized representative: Employer: AMG RESOURCES CORP. Title: R.O.M

Signature: Printed name: GREG OSWALD Date: 05/29/2025

I: Application for Minor Permit Modification. To be completed by the landfill.

Short Creek Landfill hereby applies for a minor permit modification to dispose of the special waste characterized by this Waste Characterization Form and attached documents.

Tons Once: ______ Disposed of by (date): ______ **or Tons per Year** for two years: 32,000

Check to request use as daily cover: ______ Notes: ______

Notes: ______

Signature: Barb Hardanye

Title: Mfg & Env Services

Date: 5/29/25

west virginia department of environmental protection

Division of Water and Waste Management
601 57th Street SE
Charleston, WV 25304
Phone: (304) 926-0465
Fax: (304) 926-0456

Harold D. Ward, Cabinet Secretary
dep.wv.gov

Minor Permit Modification for Disposal of Special Waste

SWPU ID: 25-03-15

Landfill: Short Creek

Generator: AMG Resources Corp

Request Received: March 7, 2025

Request Dated: March 7, 2025

Waste: Auto shredder non ferrous separation

Generated at: Benwood, WV

Comments and/or Conditions

The following checked (X) comments and/or conditions apply:

1. ☒ The West Virginia Department of Environmental Protection, Office of Solid Waste, has reviewed the information submitted by Short Creek Landfill. Based upon this information, the WVDEP believes that this waste is excluded from regulation as hazardous waste under the Resource Conservation and Recovery Act. Consequently, a minor permit modification is granted for the disposal of this waste at Short Creek Landfill.

2. ☒ Quantity Approved: 32,000 Tons

   ☒ This quantity approved is an increase of the amount allowed by the Minor Permit Modification: 24-04-32 granted: April 5, 2023

3. ☒ This amount may be received before: May 31, 2025

   ☐ The above date represents an extension of the time allowed by the Minor Permit Modification: granted:

4. ☐ Every year, by the anniversary date of the Minor Permit Modification, shall submit a recent certification from that this waste is non-hazardous.

5. ☐ Every year, by the anniversary date of this Minor Permit Modification, shall submit laboratory results for a sample representative of the waste, recently collected by , and analyzed by EPA-approved methods for: .

6. ☒ The disposal of this waste must take place during normal working hours and will not be exempted from assessment fees, and must be included in the monthly tonnage calculations.

7. ☒ Free liquids received by the landfill cannot be disposed of in the landfill. Free liquids and poorly contained liquids must be absorbed on solid material before being placed in the disposal cell. A Paint Filter Liquid Test (Method 9095) as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (EPA Pub. No. SW-846), must be performed on <u>each load</u> of waste after solidification and results maintained on site at all times with the special waste permit for review by West Virginia Department of Environmental Protection (DEP) personnel. A summary of this data must be submitted to the DEP every six (6) months from the issuance date of this permit, for the life of the permit.

8. ☒ Additional comments and/or conditions: This Minor Permit Modification is issued on temporary basis to allow the generator to comply with the DEP protocol of samples to be collected from normal production output 3 days a week for a period of 4 weeks, for a total of 12 samples. Each daily sample shall consist of a composite generated from grab samples collected every half-hour over the course of the operating day. In the event that 3 operating days are not available in a week, a substitute daily sample may be collected from stockpile waste. All samples shall be representative of the waste and include all materials types (e.g. plastic, foam, metal, rubber, fabric, wire, etc.) typical of the waste. All samples shall be analyzed for TCLP Metals, TCLP VOCs, TCLP SVOCs, PCBs, TPH-GRO/DRO/ORO .

9. ☒ The landfill must maintain monthly storage capacity to accommodate the disposal of municipal solid waste as per the facility's Certificate of Necessity. This permit in no way allows the landfill to guarantee space or accept waste from the waste generator if the guarantee or acceptance of the waste will be likely to create an excess in monthly tonnage.

10. ☒ If you have questions or need additional information, please contact Bassam Makar at (304) 926-0499, extension 43851 or Bassam.Y.Makar@wv.gov

Minor Permit Modification is granted

Jeremy W. Bandy

Jeremy W. Bandy
Director

<u>May 1, 2025</u>
Date

Civil & Environmental Consultants, Inc.

May 21, 2025

Mr. Greg Oswald
AMG Resources Corporation
66 35th Street
Wheeling, West Virginia 26003
goswald@amgresources.com

Dear Mr. Oswald:

Subject: Shredder Fluff Permit Renewal Sampling – Benwood Facility
748 McMechen Street, Benwood, West Virginia
CEC Project 334-094.0003

The following summarizes the permit renewal sampling of the shredder fluff generated at the AMG Resources Corporation (AMG) facility located at 748 McMechen Street, Benwood, West Virginia conducted by Civil & Environmental Consultants, Inc. (CEC) between March 25, 2025 and April 23, 2025 in accordance with the West Virginia Department of Environmental Protection (WVDEP) permit renewal guidance.

1.0 BACKGROUND AND PURPOSE

The Benwood facility processes scrap metal, primarily from automobiles, for reuse/recycling by various customers. Shredder fluff is a non-metallic material such as glass, fiber, foam rubber, and plastic that is segregated from the metallic material after processing the vehicle through a shredder. AMG removes potentially hazardous materials such as car batteries, gasoline, and similar items prior to the recycling/shredding operations. Shredder fluff is staged at two drop points within the Benwood Facility. The shredder fluff generated at the Benwood facility is transported to Republic Services' Short Creek Landfill (Republic) located in Wheeling, West Virginia as a Special Waste for use as daily cover.

2.0 SAMPLING

Samples were collected between March 25, 2025 and April 23, 2025. As described in the WVDEP permit renewal guidance, the samples were collected from normal production output three days a week for a period of four weeks. Each daily sample consisted of a composite generated from five grab samples collected every half hour from each of the two drop points (for a total of ten grab samples per half hour). The drop piles were examined for material type and distribution every half hour (see the Daily Field Report (DFR) included in Appendix A). Periods when a drop point was not in operation are noted in the DFRs.

The facility was not in operation between April 16, 2025 and April 21, 2025 due to mechanical issues. Any material stockpiled onsite had been sampled following the procedures above on April 15, 2025; therefore, the substitute daily sample procedure given in the WVDEP guidance was not applicable. The final two samples were collected on April 22 and 23, 2025, as soon as the facility resumed operations.

The samples were placed in a cooler with ice and shipped for overnight delivery to Pace Analytical Mt. Juliet, Tennessee under industry standard chain-of-custody procedures. Following the WVDEP permit renewal guidance, the samples were analyzed for the standard quarterly parameters, including Toxicity Characteristics Leaching Procedure (TCLP) metals (Method 6010) and total PCBs by "dry weight" (Method 8082). The samples were also analyzed for TCLP Volatile Organic Compounds (VOCs) (Method 8260), TCLP Semi-Volatile Organic Compounds (SVOCs) (Method 8270), and Total Petroleum Hydrocarbons (TPH) Gasoline Range Organics, Diesel Range Organics, and Oil Range Organics (GRO/DRO/ORO) (Method 8015).

3.0 DATA MANAGEMENT AND REVIEW

The analytical results are summarized in Table 1, and the laboratory analytical reports are included in Appendix B. The TCLP results were compared to the U.S. Environmental Protection Agency (U.S. EPA) Maximum Concentration of Contaminants for the Toxicity Characteristic (Title 40 Part 261.24), and the total PCB results were compared to the EPA limit of 50 mg/kg for classification as Toxic Substances Control Act (TSCA) waste. No standards exist for TPH GRO/DRO/ORO.

As described in the approved "Shredder Fluff Sampling Protocol" dated August 15, 2023 and revised March 27, 2025, the 90% Upper Confidence Limit (UCL) was calculated for each constituent that was detected above the laboratory Reporting Limit in one or more samples, using one-half the Reporting Limit for those results reported as non-detect. The 90% UCL was calculated using the U.S. EPA's ProUCL version 5.2 (ProUCL). The 90% UCL was calculated according to the distribution method (i.e. normal, gamma or lognormal) for each parameter. Where the data had no discernable distribution, the Student's-t method was used as recommended by ProUCL. The ProUCL outputs are included in Appendix C.

As shown on Table 1, no individual TCLP metals exceeded their respective toxicity characteristic standards, and likewise, the 90% UCL for the twelve samples did not exceed the toxicity characteristic standards. No VOCs or SVOCs were detected above their respective Reporting Limits.

One sample (SF-11) exceeded the TSCA standard for total PCBs (201 mg/kg). The concentration of the PCB isomer which exceeded the standard (Aroclor 1254) was an order of magnitude greater than any concentration that has been detected at the facility for this PCB isomer since at least November 2021. ProUCL evaluates potential outliers using Dixon's Outlier Test. At the 1%, 5%, and 10% significance level, the 201 mg/kg result is considered an outlier (Appendix C), and therefore this result was excluded from the 90% UCL calculation for total PCBs. The 90% UCL for the adjusted data set does not exceed the TSCA standard.

4.0 CLOSING

We appreciate the opportunity to provide assistance to you on this project. Please call if you have any questions or wish to discuss the permit renewal sampling.

Very truly yours,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Laura Campbell

Laura D. Campbell, P.G.
Project Manager

Mary A. King

Mary A. King, P.G.
Senior Project Manager

Enclosures

cc: Bobbi Lydon, AMG

TABLES

TABLE 1
SUMMARY OF LABORATORY ANALYTICAL RESULTS
BENWOOD SHREDDER FLUFF SAMPLING
BENWOOD, WV
AMG RESOURCES CORPORATION
CEC PROJECT NUMBER: 334-094

	Sample Information												90% UCL [2]	Toxicity Characteristic Standards [3]
SAMPLE ID:	**SF-1**	**SF-2**	**SF-3**	**SF-4**	**SF-5**	**SF-6**	**SF-7**	**SF-8**	**SF-9**	**SF-10**	**SF-11**	**SF-12**		
SAMPLE DATE:	**3/25/2025**	**3/26/2025**	**3/27/2025**	**3/31/2025**	**4/1/2025**	**4/3/2025**	**4/8/2025**	**4/9/2025**	**4/10/2025**	**4/15/2025**	**4/22/2025**	**4/23/2025**		
Polychlorinated Biphenyls (PCBs) (mg/kg)														
PCB Aroclor 1016	< 0.573	< 0.0943	< 0.656	< 0.156	< 0.178	< 0.143	< 0.593	< 0.644	< 0.592	< 0.211	< 0.143 J5	< 0.610	NA	**nse**
PCB Aroclor 1221	< 0.573	< 0.0943	< 0.656	< 0.156	< 0.178	< 0.143	< 0.593	< 0.644	< 0.592	< 0.211	< 0.143	< 0.610	NA	**nse**
PCB Aroclor 1232	< 0.573	< 0.0943	< 0.656	< 0.156	< 0.178	< 0.143	< 0.593	< 0.644	< 0.592	< 0.211	< 0.143	< 0.610	NA	**nse**
PCB Aroclor 1242	**7.65**	**11.3**	**8.85**	**9.97**	**3.4**	**37.3**	**9.77**	**7.98**	**6.82**	**5.62 P**	< 0.143	**26.6**	NA	**nse**
PCB Aroclor 1248	< 0.287	< 0.0471	< 0.328	< 0.0777	< 0.0888	< 0.0716	< 0.296	< 0.322	< 0.297	< 0.106	< 0.0716	< 0.304	NA	**nse**
PCB Aroclor 1254	**1.7**	**2.87**	**1.69**	**3.72 P**	**1.51**	**5.84 P**	< 0.296	**1.07**	< 0.297	**1.45**	**201**	< 0.304	NA	**nse**
PCB Aroclor 1260	< 0.287	< 0.0471	< 0.328	< 0.0777	< 0.0888	< 0.0716	**1.49**	< 0.322	< 0.297	< 0.106	< 0.0716 J5	< 0.304	NA	**nse**
Total PCBs [1]	**9.35**	**14.17**	**10.54**	**13.69**	**4.91**	**43.14**	**11.26**	**9.05**	**6.82**	**7.07**	**201**	**26.6**	**20.1 [5]**	**50 [4]**
Total Petroleum Hydrocarbons (TPH) (mg/kg)														
Gasoline Range Organics (C6-C10)	**418**	**411**	**377**	**183 B**	**280**	**270**	**37.3**	**43.3**	**34.4**	**88.2**	**172**	**357**	**281.4**	**nse**
Diesel Range Organics (C10-C28)	**11,100**	**14,100**	**74,600**	< 5,660	**11,000**	**8,540**	**13,000**	**15,700**	**14,600**	**11,200**	**7,120**	**13,300**	**23,772**	**nse**
Oil Range Organics (C28-C40)	**16,000**	< 11,200	**69,500**	**15,400**	**17,600**	**15,000**	**20,300**	**23,400**	**22,600**	**24,900**	**13,300**	**17,800**	**28,789**	**nse**
Toxicity Characteristics Leaching Procedure (TCLP) Metals (mg/l)														
Arsenic	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	**5**
Barium	**0.713**	**0.742**	**0.504**	**0.363**	**0.535**	**0.633**	**0.848**	**0.798**	**0.857**	**0.884**	**0.748**	**0.625**	**0.75**	**100**
Cadmium	**0.144**	**0.182**	**0.151**	**0.145**	**0.141**	**0.113**	**0.361**	**0.206**	**0.195**	**0.173**	< 0.1	< 0.1	**0.191**	**1**
Chromium	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	**5**
Lead	**0.356**	**0.733**	**1.33**	**0.173**	**0.408**	**0.355**	**1.19**	**0.438**	**3.58**	**0.234**	< 0.1	< 0.1	**1.327**	**5**
Selenium	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	**1**
Silver	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	**5**
Mercury	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	NA	**0.2**
Toxicity Characteristics Leaching Procedure (TCLP) Volatile Organic Compounds (VOCs) (mg/l)														
1,1-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	**0.7**
1,2-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	**0.5**
2-Butanone (MEK)	< 0.5 C3 J3	< 0.5 C3 J3	< 0.5 C3 J3	< 0.5 J3	< 0.5 J3	< 0.5 J3	< 0.5 J3	< 0.5 J3	< 0.5 J3	< 0.5 C3	< 0.5	< 0.5	NA	**200**
Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	**0.5**
Carbon Tetrachloride	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	**0.5**
Chlorobenzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	**100**
Chloroform	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	NA	**6**
Tetrachloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	**0.7**
Trichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05 J3	< 0.05 J3	< 0.05 J3	< 0.05	< 0.05	< 0.05	NA	**0.5**
Vinyl Chloride	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	**0.2**
Toxicity Characteristics Leaching Procedure (TCLP) Semi-Volatile Organic Compounds (SVOCs) (mg/l)														
1,4-Dichlorobenzene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	**7.5**
2,4,5-Trichlorophenol	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	**400**
2,4,6-Trichlorophenol	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	**2**
2,4-Dinitrotoluene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	**0.13**
2-Methylphenol (o-Cresol)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1 C3	< 0.1 C3	NA	**200**
3&4-Methyl Phenol (m&p-Cresol)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	**200**
Hexachloro-1,3-Butadiene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	**0.5**
Hexachlorobenzene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	**0.13**
Hexachloroethane	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	**3**
Nitrobenzene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	**2**
Pentachlorophenol	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1 C3	< 0.1 C3	NA	**100**
Pyridine	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	**5**
General Chemistry														
Total Soilds (%)	**74.2**	**71.8**	**76.2**	**70.6**	**71.4**	**71.2**	**77.9**	**79.2**	**77.5**	**73.9**	**76.7**	**77.5**	NA	**nse**

Notes

1. Result is the sum of all PCBs detected above the Reported Detection Limit (RDL).
2. The 90% Upper Confidence Level (UCL) calculated using ProUCL Version 5.2 for all parameters detected in one or more sample(s), using one half the detection limit for non-detects.
3. U.S. EPA Maximum Concentration of Contaminants for the Toxicity Characteristic (Title 40 Part 261.24).
4. Total PCBs are compared to the U.S. Environmental Protection Agency (EPA) limit for classification as Toxic Substances Control Act (TSCA) waste.
5. The April 22, 2025 concentration for Aroclor 1254 was determined to be a statistical outlier using the EPA ProUCL Version 5.2 software. The sample was excluded from the 90% UCL calculation.

nse Denotes no standard exists

NA Denotes "Not Applicable," constituent was not detected above the RDL in any sample.

Values in bold were detected at concentrations above the RDL.

Qualifier Definitions

<	Not detected above Reported Detection Limit (RDL).
B	The analyte was found in the associated blank.
C3	The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Method sensitivity check is acceptable.
J	The reported concentration is less than the Reporting Limit but greater than or equal to the RDL and the concencration is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
P	RPD between the primary and confirmatory analysis exceeded 40%.

ATTACHMENT A

DAILY FIELD REPORTS

DAILY FIELD REPORT

Date: 03/25/2025 (Tuesday)
Page 1 of 2

Civil & Environmental Consultants, Inc.

PROJECT INFORMATION

PROJECT NAME:	Benwood Shredder Sampling – Permit Renewal Sampling		
LOCATION:	748 McMechen Street, Benwood, WV	CEC PROJECT NO:	334-094
PLANS AND SPECS:	NA	WEATHER:	Sunny/Windy
ISSUED DATE:	NA	TEMP. RANGE (°F)	34-50

PERSONNEL

FIELD REP(S):	Sarah Van Horn (SAV)	CEC PROJ. MANAGER(S):	Laura Campbell
CLIENT:	AMG	CLIENT CONTACT(S):	Greg Oswald
CONTRACTOR:	NA	SUPERVISOR(S):	Mary King

SAFETY MEETING PARTICIPATION

Participation in Contractor's Tailgate Safety Meeting? ☐ **Yes** ☒ **No** *Vehicle Check Performed?* ☒ **Yes or** ☐ **No**

Observed Hazards:

- Slips hazards
- Site Traffic
- Overhead hazards – AMG stopped discharge conveyor
- Dust

WORK PERFORMED SINCE CEC'S LAST VISIT(1)

Work performed since CEC representative's last site visit? (1) ☐ **Yes** ☒ **No**

Date CEC representative was last onsite: **N/A**

(1) Critical work or work requiring continuous observation that has been completed without CEC representation being present onsite. CEC was not made aware that this work was being completed.

ONSITE REPRESENTATIVES PRESENT TODAY

Karl Kerstetter

SUMMARY OF WORK OBSERVED, LOCATION, AND CONTRACTOR PERFORMING WORK

SITE ARRIVAL: **0645** SITE DEPARTURE: **1645**

- SAV met with Karl Kerstetter for check-in at 06:55.
- Sampling started around 07:15
- Collected grab samples at Drop Point 1 and then Drop Point 2 every half hour according to the sampling plan dated 3/20/25.
- Drop Point 1 ran from ~06:30-~12:00 then resumed from ~12:30-15:00. Pause due to lunch break.
- Drop Point 2 ran from ~06:30-~11:30 then resumed from ~12:00-16:00. Pause due to lunch break.
- SAV composited materials at 16:00.
- SAV left site at approximately 16:45.

UNEXPECTED, UNUSUAL, OR NONCONFORMING OBSERVATIONS (NEW / RESOLVED)

Unexpected, unusual, or nonconforming work observed? ☐ **Yes** ☒ **No**

SUMMARY OF MEETINGS / DISCUSSIONS / PHONE CONVERSATIONS

Discussed with Mike Wolfe when the employees take lunch breaks.

MATERIALS DELIVERED/USED ONSITE

N/A

ATTACHMENTS

Chain of Custody, Photographs, Field Notes

DESCRIPTION OF SAMPLES TAKEN OR MATERIALS DELIVERED TO LAB

- Grab samples were composited according to the plan following the final grab samples. Samples were packed on ice immediately after compositing. Samples were stored in a dedicated sample refrigerator until shipping on 3/27/2025 via FedEx to Pace National laboratory in Mt. Juliet, TN.

FIELD REP: SAV DATE: 05/14/2025 CEC MANAGER: LDC DATE: 05/15/2025

This document is draft until reviewed and approved by a Project Manager

Company Name/Address:
Civil & Environmental Consultants - PA
700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:
Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to: Laura Campbell 800-365-2324

Email To: lcampbell@cecinc.com

Project Description: Benwood Shredder Fluff

City/State Collected: Benwood WV

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project # 335-863

Lab Project # CECPPA-BENWOOD

Collected by (print): Sarah Van Horn

Site/Facility ID # AMG

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day ___ STD TAT

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

SDG # 184/389

Table E002

Acctnum: CECPPA
Template: T270505
Prelogin: P1139373
PM: 3564 - Chad A Upchurch
PB: 3/20/25 BK
Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres	Remarks	Sample # (lab only)
SF-1	Comp	SS		3-25-25	1600	2			X		-01
SF-1	Comp	SS		3-25-25	1600	2	X	X			-02

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_________

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ___________

Tracking # 4439 2445 1442

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: X Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	
	3-27-25	2000		Trip Blank Received: [✓ Yes] / No [✓ HCL] / MeoH TBR
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: TLA92 0+0.4=2.4 °C Bottles Received: ✓
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 3/28/25 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / [✓ OK]

334-094
Benwood Facility
AMG Resources Corporation
March 25, 2025

Drop Pile 1

Drop Pile 1

Drop Pile 2

Drop Pile 2

Sampled material

Sampled material

3-25-25

AMG Benwood onsite 0645

Met with Carl 0655

0715 sample 1-10
0745 "
0805 "
0830 "
0900 "
0930 "
1000 "
1100 "
1130 "
1200 sample ~~1-10~~ 6-10 not running
sample 1-5 collectn
1230 sample 6-10 collectn
sample 1-5 not running
1300 sample 1-10
1330 "
1400 "
1430 "
1500 sample 1-5 stop for day no sample
6-10 collectn
1530 "
1600 6-10 stop for day no sample
composite sample 1600

offsite 1645

DAILY FIELD REPORT

Date: 03/26/2025 (Wednesday)

CEC
Civil & Environmental Consultants, Inc.

PROJECT INFORMATION

PROJECT NAME:	Benwood Shredder Sampling – Permit Renewal Sampling		
LOCATION:	748 McMechen Street, Benwood, WV	CEC PROJECT NO:	334-094
PLANS AND SPECS:	NA	WEATHER:	Sunny/Windy
ISSUED DATE:	NA	TEMP. RANGE (°F)	32-46

PERSONNEL

FIELD REP(S):	Hannah Enderby (HRE)	CEC PROJ. MANAGER(S):	Laura Campbell
CLIENT:	AMG	CLIENT CONTACT(S):	Greg Oswald
CONTRACTOR:	NA	SUPERVISOR(S):	Mary King

SAFETY MEETING PARTICIPATION

Participation in Contractor's Tailgate Safety Meeting? ☐ **Yes** ☒ **No** *Vehicle Check Performed?* ☒ **Yes or** ☐ **No**

Observed Hazards:

- Slips hazards
- Site Traffic
- Overhead hazards – AMG stopped discharge conveyor
- Dust

WORK PERFORMED SINCE CEC'S LAST VISIT(1)

Work performed since CEC representative's last site visit? (1) ☐ **Yes** ☒ **No**

Date CEC representative was last onsite: **N/A**

(1) Critical work or work requiring continuous observation that has been completed without CEC representation being present onsite. CEC was not made aware that this work was being completed.

ONSITE REPRESENTATIVES PRESENT TODAY

Karl Kerstetter

SUMMARY OF WORK OBSERVED, LOCATION, AND CONTRACTOR PERFORMING WORK

SITE ARRIVAL: **06:40**	SITE DEPARTURE: **16:45**

- HRE met with Karl Kerstetter for check-in at 06:40.
- Sampling started around 07:25 due to Plant Traffic upon CEC entrance.
- Collected grab samples at Drop Point 1 and then Drop Point 2 every half hour according to the sampling plan dated 3/20/25.
- Drop Point 1 ran from ~06:30-14:25.
- Drop Point 2 ran from ~06:30-~11:45 then resumed from ~15:15-15:45. Pause due to technical issues of the conveyer belt.
- HRE composited materials at 16:00.
- HRE left site at approximately 16:45.

UNEXPECTED, UNUSUAL, OR NONCONFORMING OBSERVATIONS (NEW / RESOLVED)

Unexpected, unusual, or nonconforming work observed? ☐ **Yes** ☒ **No**

SUMMARY OF MEETINGS / DISCUSSIONS / PHONE CONVERSATIONS

Discussed with Plant Employee (Toni) that Grab Point 2 conveyer belt was having technical issues leading to conveyer stopping from ~11:45. Confirmed with Karl Kerstetter that Grab Location #2 was down and would continue running once issue was resolved around 15:15 and would continue running until approximately 15:45 or, at the very latest, 16:00.

MATERIALS DELIVERED/USED ONSITE

N/A

ATTACHMENTS

Chain of Custody, Photographs, Field Notes

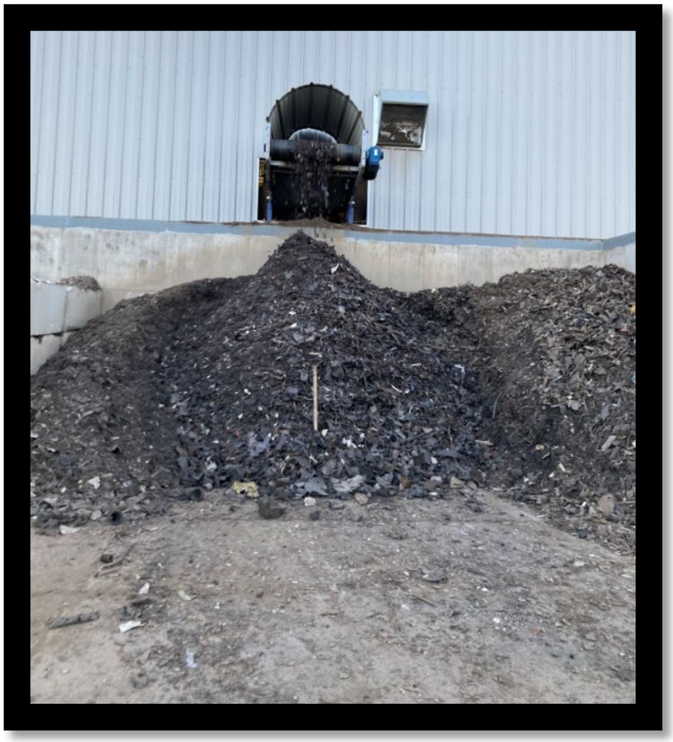
DESCRIPTION OF SAMPLES TAKEN OR MATERIALS DELIVERED TO LAB

- Grab samples were composited according to the work plan following the final grab samples. Samples were packed on ice immediately after compositing. Samples were shipped on 3/27/2025 via FedEx to Pace National laboratory in Mt. Juliet, TN.

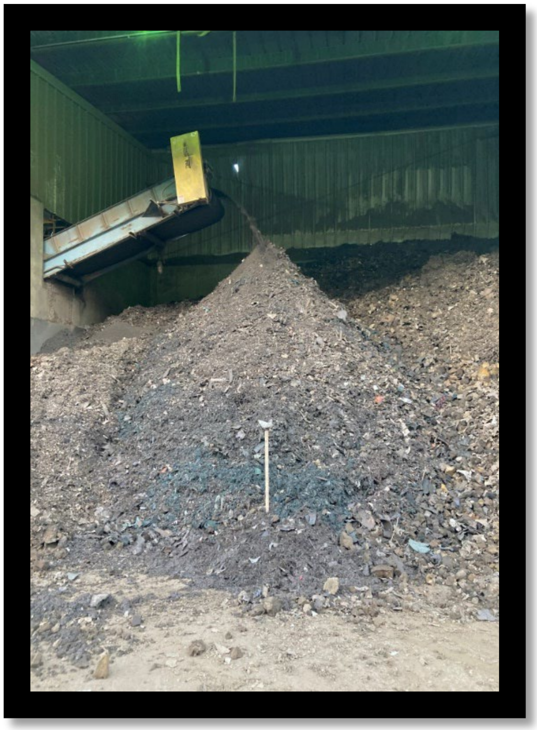
FIELD REP: HRE DATE: 03/26/2025 CEC MANAGER: LDC DATE: 05/14/2025

This document is draft until reviewed and approved by a Project Manager

334-094
Benwood Facility
AMG Resources Corporation
March 26, 2025



Grab Location 1 - First Samples Taken @07:25



Grab Location 2 - First Samples Taken @07:40

Grab Location 1 - Final Samples Taken @14:25

Grab Location 2 - Final Samples Taken @15:45

Chain of Custody Page 1 of 1

Pace PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # 1841390

Ta E003

Acctnum: **CECPPA**
Template: **T270505**
Prelogin: **P1139362**
PM: **3564 - Chad A Upchurch**
PB: LU 3/19/25
Shipped Via: **FedEX Ground**

Company Name/Address:
Civil & Environmental Consultants - PA
700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:
Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Email To: **lcampbell@cecinc.com**

Report to: **Laura Campbell 800-365-2324**

Project Description: **Benwood Shredder Fluff**

City/State Collected: Benwood, WV

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project # **335-863**

Lab Project # **CECPPA-BENWOOD**

Collected by (print): H. Enderby

Site/Facility ID # AMG Resources Benwood

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day X STD TAT

Quote #

Date Results Needed

Immediately Packed on Ice N ____ Y X

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres								Remarks	Sample # (lab only)
SF-2	Comp	SS		3/26/25	1600	2			X									-01
SF-2	Comp	SS		↑	1600	2	X	X										-02

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_________

Remarks:

pH _______ Temp _______

Flow _______ Other _______

Samples returned via:
__ UPS __ FedEx __ Courier ___________

Tracking # 44392445/442

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature) Hannah Enderby	Date: 3/26/2025	Time: 1745	Received by: (Signature)
Relinquished by : (Signature)	Date: 3-27-25	Time: 2000	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: [✓ Yes] / No
[✓ HCL] / MeoH
TBR

Temp: TCA92 2.0+0.4=2.4 °C Bottles Received: 4

Date: 3/28/25 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / [✓ OK]

3/26/25 AMG Resources – Benwood, WV

Benwood Shredder Fluff Permit Ren. Sampl

@0640 Arrived onsite & checked in with Karl.

*HEAVY TRUCK TRAFFIC – LATE START SAMPLING.

Sampling Data

Time	Location Shredder #1 or #2	Fluff Pile Appx. Dimensions (m)
@0725	1	wall to wall → ~10L x 3.5H x 5W
@0740	2	~15L x 4H x 5W
@0755	1	~10L x 3H x 6W
@0810	2	~15L x 5H x 5 or 6W
@0825	1	~10L x 3H x 5W
@0840	2	~15L x 4.5H x 6W
@0855	1	~10L x 3.5H x 5W
@0910	2	~15L x 6H x 6W
@0925	1	~10L x 4H x 5W
@0940	2	~15L x 6H x 6W
@1000	1	~10L x 4H x 5W
@1010	2	~15L x 5H x 6W
@1030	1	~10L x 2.5H x 5W
@1040	2	~15L x 3H x 5W ← 6W
@1105	1	~10L x 3H x 5W
@1115	2	~15L x 4H x 6W
@1135	1	~10L x 3H x 5W
@1145	←2	~15L x 4H x 6W

Pg 1 of 2

Pg. 2 Benwood Sampling Data

Time	Location #1 or #2	Fluff Pile L×H×W appx. Dimensions (m)
1205	1	1L × 1H × 1.5W
@ 1215	2	15L × 4H × 6W
@ 1235	1	1L × 1H × 1.5W
@ 1245	2	15L × 4H × 6W
@ 1305	1	3L × 3H × 4W
@ 1315	2	15L × 4H × 6W
@ 1350	1	5L × 4H × 5W
@ 1405	2	15L × 4H × 6W
@ 1425	1 – Done	6L × 4.5H × 6W

Note: @ 1430 Informed by Toni that the larger shredder (Location 2) is done for the day + has an issue the plant attempting to fix. In fact it has been down since ~1145. Will confirm if done. Location 1 shredder set to shut down by ~1430 per Toni. Will confirm. @ 1515 HRE confirmed w/ Karl Location #2 will be back up from ~1515 to ~1600.

@ 1515	2	6L × 4H × 6W
@ 1545	2 – Done	
@ 1600	Samples composited	
@ EOD: 1645	SF-2, sign a COC + fill it out for SVH.	

Pg 2 of 2

DAILY FIELD REPORT

Date: 03/27/2025 (Thursday)
Page 1 of 2

Civil & Environmental Consultants, Inc.

PROJECT INFORMATION

PROJECT NAME:	Benwood Shredder Sampling – Permit Renewal Sampling		
LOCATION:	748 McMechen Street, Benwood, WV	CEC PROJECT NO:	334-094
PLANS AND SPECS:	NA	WEATHER:	Sunny/Windy
ISSUED DATE:	NA	TEMP. RANGE (°F)	32-55

PERSONNEL

FIELD REP(S):	Sarah Van Horn (SAV)	CEC PROJ. MANAGER(S):	Laura Campbell
CLIENT:	AMG	CLIENT CONTACT(S):	Greg Oswald
CONTRACTOR:	NA	SUPERVISOR(S):	Mary King

SAFETY MEETING PARTICIPATION

Participation in Contractor's Tailgate Safety Meeting? ☐ **Yes** ☒ **No** *Vehicle Check Performed?* ☒ **Yes or** ☐ **No**

Observed Hazards:

- Slips hazards
- Site Traffic
- Overhead hazards – AMG stopped discharge conveyor
- Dust

WORK PERFORMED SINCE CEC'S LAST VISIT$^{(1)}$

Work performed since CEC representative's last site visit? $^{(1)}$ ☐ **Yes** ☒ **No**

Date CEC representative was last onsite: **N/A**

(1) Critical work or work requiring continuous observation that has been completed without CEC representation being present onsite. CEC was not made aware that this work was being completed.

ONSITE REPRESENTATIVES PRESENT TODAY

Mike Wolfe

SUMMARY OF WORK OBSERVED, LOCATION, AND CONTRACTOR PERFORMING WORK

SITE ARRIVAL: **0650**	SITE DEPARTURE: **1700**

- SAV arrived onsite and parked in the rear of the facility.
- Sampling started around 07:10
- Collected grab samples at Drop Point 1 and then Drop Point 2 every half hour according to the sampling plan dated 3/20/25.
- Drop Point 1 ran from ~06:30-~9:00, then experienced machinal issues for the remainder of the day.
- Drop Point 2 ran from ~06:30-~11:00 then resumed from ~11:30-16:00. Pause due to lunch break.
- SAV composited materials at 16:30.
- SAV left site at approximately 17:00.

UNEXPECTED, UNUSUAL, OR NONCONFORMING OBSERVATIONS (NEW / RESOLVED)

Unexpected, unusual, or nonconforming work observed? ☐ **Yes** ☒ **No**

SUMMARY OF MEETINGS / DISCUSSIONS / PHONE CONVERSATIONS

Discussed with Mike Wolfe the mechanical issues causing drop point 1 to be shut down.

MATERIALS DELIVERED/USED ONSITE

N/A

ATTACHMENTS

Chain of Custody, Photographs, Field Notes

DESCRIPTION OF SAMPLES TAKEN OR MATERIALS DELIVERED TO LAB

- Grab samples were composited according to the plan following the final grab samples. Samples were packed on ice immediately after compositing. SAV shipped all samples for the week on 3/27/2025 via FedEx to Pace National laboratory in Mt. Juliet, TN.

FIELD REP: SAV DATE: 05/14/2025 CEC MANAGER: LDC DATE: 05/15/2025

This document is draft until reviewed and approved by a Project Manager

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* No representations or warranties are made regarding the accuracy of the information generated by the Theodolite application, which is stamped on the photo, or the suitability of that information for any; legal, engineering, surveying, or other use or purpose.

Company Name/Address:
Civil & Environmental Consultants - PA
700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:
Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Chain of Custody Page 1 of 1

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to: Laura Campbell 800-365-2324

Email To: lcampbell@cecinc.com

Project Description: Benwood Shredder Fluff

City/State Collected: Benwood WV

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #: 335-863

Lab Project #: CECPPA-BENWOOD

Collected by (print): Sarah Van Horn

Site/Facility ID #: AMG

P.O. #:

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day ___ STD TAT

Quote #:

Date Results Needed:

Immediately Packed on Ice N ___ Y ✓

SDG #:
Table #:
Acctnum: CECPPA
Template: T270505
Prelogin: P1139368
PM: 3564 - Chad A Upchurch
PB: 3/20/25 BK
Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres	Remarks	Sample # (lab only)
SF-3	Comp	SS		3-27-25	1630	2			X		
SF-3	Comp	SS		3-27-25	1630	2	X	X			

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ________

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: _NP _Y _N
COC Signed/Accurate: _Y _N
Bottles arrive intact: _Y _N
Correct bottles used: _Y _N
Sufficient volume sent: _Y _N
If Applicable
VOA Zero Headspace: _Y _N
Preservation Correct/Checked: _Y _N
RAD Screen <0.5 mR/hr: _Y _N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
	3-27-25	2000			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

334-094
Benwood Facility
AMG Resources Corporation
March 27, 2025

Drop Pile 1

Drop Pile 1

Drop Pile 2

Drop Pile 2

Sampled material

Sampled material

3-27-25
AMG Benwood onsite 0650

0710 sample 1-10
0730 sample 1-10
0800 "
0830 "
0900 "
0930 conveyor belts off, remove piles, break?
1000 1-5 no sample, still down
6-10 collected
1030 "
1100 "
1130 1-5 no sample, still down
6-10 on lunch, no sample
1200 1-5 no sample, still down
6-10 collected
1230 "
1300 "
1330 "
1400 "
1430 "
1500 "
1530 "
1600 "
Sample 1630

DAILY FIELD REPORT

Date: 03/31/2025 (Monday)

PROJECT INFORMATION

PROJECT NAME:	Benwood Shredder Sampling – Permit Renewal Sampling		
LOCATION:	748 McMechen Street, Benwood, WV	CEC PROJECT NO:	334-094
PLANS AND SPECS:	NA	WEATHER:	Rainy/Partly Cloudy
ISSUED DATE:	NA	TEMP. RANGE (°F)	50-55

PERSONNEL

FIELD REP(S):	Sarah Van Horn (SAV)	CEC PROJ. MANAGER(S):	Laura Campbell
CLIENT:	AMG	CLIENT CONTACT(S):	Greg Oswald
CONTRACTOR:	NA	SUPERVISOR(S):	Mary King

SAFETY MEETING PARTICIPATION

Participation in Contractor's Tailgate Safety Meeting? ☐ **Yes** ☒ **No** *Vehicle Check Performed?* ☒ **Yes or** ☐ **No**

Observed Hazards:

- Slips hazards
- Site Traffic
- Overhead hazards – AMG stopped discharge conveyor
- Dust

WORK PERFORMED SINCE CEC'S LAST VISIT(1)

Work performed since CEC representative's last site visit? (1) ☐ **Yes** ☒ **No**

Date CEC representative was last onsite: **N/A**

(1) Critical work or work requiring continuous observation that has been completed without CEC representation being present onsite. CEC was not made aware that this work was being completed.

ONSITE REPRESENTATIVES PRESENT TODAY

Mike Wolfe

SUMMARY OF WORK OBSERVED, LOCATION, AND CONTRACTOR PERFORMING WORK

SITE ARRIVAL: **0700**	SITE DEPARTURE: **1645**

- SAV arrived onsite and parked in the rear of the facility.
- Sampling started around 07:30. Drop Point 2 was not in operation.
- Collected grab samples at Drop Point 1 every half hour according to the sampling plan dated 3/20/25.
- Drop Point 1 ran from ~07:00-~16:00.
- SAV composited materials at 16:30.
- SAV left site at approximately 16:45.

UNEXPECTED, UNUSUAL, OR NONCONFORMING OBSERVATIONS (NEW / RESOLVED)

Unexpected, unusual, or nonconforming work observed? ☐ **Yes** ☒ **No**

SUMMARY OF MEETINGS / DISCUSSIONS / PHONE CONVERSATIONS

N/A

MATERIALS DELIVERED/USED ONSITE

N/A

ATTACHMENTS

Chain of Custody, Photographs, Field Notes

DESCRIPTION OF SAMPLES TAKEN OR MATERIALS DELIVERED TO LAB

- Grab samples were composited according to the plan following the final grab samples. Samples were packed on ice immediately after compositing. Sample was stored in a dedicated refrigerator until shipped on 4/3/2025 via FedEx to Pace National laboratory in Mt. Juliet, TN.

FIELD REP: SAV DATE: 05/14/2025 CEC MANAGER: LDC DATE: 05/15/2025

This document is draft until reviewed and approved by a Project Manager

Company Name/Address:
Civil & Environmental Consultants - PA

700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:
Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to:
Laura Campbell 800-365-2324

Email To: lcampbell@cecinc.com

Project Description:
Benwood Shredder Fluff

City/State Collected:

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project # ~~335-863~~ SAV 334-094

Lab Project # **CECPPA-BENWOOD**

Collected by (print): Sarah Van Horn

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day ___ STD TAT

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

SDG #

Table #

Acctnum: **CECPPA**
Template: **T270505**
Prelogin: **P1139370**
PM: 3564 - Chad A Upchurch
PB: 3/20/25 BK
Shipped Via: **FedEX Ground**

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres	Remarks	Sample # (lab only)
SF-4	Comp	SS		3-31-25		2			X		
SF-5	Comp	SS		4-1-25		2	X	X			
SF-6	Comp	SS		4-3-25		2					

* Matrix:
SS - Soil **AIR** - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ________

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)
Date: 4-3-25
Time: 1900
Received by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Relinquished by : (Signature)
Date:
Time:
Received by: (Signature)

Temp: °C Bottles Received:

If preservation required by Login: Date/Time

Relinquished by : (Signature)
Date:
Time:
Received for lab by: (Signature)

Date: Time:

Hold:

Condition: NCF / OK

334-094
Benwood Facility
AMG Resources Corporation
March 31, 2025

Drop Pile 1

Drop Pile 1

Drop Pile 2

3-31-25

Amh Benwood onsite 0700

only one shredder running today

start up 6:45-7 am

first sample	7:30	1-5	sampled
	8:00		"
	0830		"
	0900		"
	0930		"
	1000		"
	1030		"
	1100		"
	1130		"
	1200		"
	1230		"
	1300		"
	1330		"
	1400		"
	1430		"
	1500		"
	1530		"
	1600		"

sample 1630

offsite 1645

DAILY FIELD REPORT

Date: 04/01/2025 (Tuesday)
Page 1 of 2

Civil & Environmental Consultants, Inc.

PROJECT INFORMATION

PROJECT NAME:	Benwood Shredder Sampling – Permit Renewal Sampling		
LOCATION:	748 McMechen Street, Benwood, WV	CEC PROJECT NO:	334-094
PLANS AND SPECS:	NA	WEATHER:	Rainy/Cloudy
ISSUED DATE:	NA	TEMP. RANGE (°F)	34-50

PERSONNEL

FIELD REP(S):	Sarah Van Horn (SAV)	CEC PROJ. MANAGER(S):	Laura Campbell
CLIENT:	AMG	CLIENT CONTACT(S):	Greg Oswald
CONTRACTOR:	NA	SUPERVISOR(S):	Mary King

SAFETY MEETING PARTICIPATION

Participation in Contractor's Tailgate Safety Meeting? ☐ **Yes** ☒ **No** *Vehicle Check Performed?* ☒ **Yes or** ☐ **No**

Observed Hazards:

- Slips hazards
- Site Traffic
- Overhead hazards – AMG stopped discharge conveyor
- Dust

WORK PERFORMED SINCE CEC'S LAST VISIT(1)

Work performed since CEC representative's last site visit? (1) ☐ **Yes** ☒ **No**

Date CEC representative was last onsite: **N/A**

(1) Critical work or work requiring continuous observation that has been completed without CEC representation being present onsite. CEC was not made aware that this work was being completed.

ONSITE REPRESENTATIVES PRESENT TODAY

Mike Wolfe

SUMMARY OF WORK OBSERVED, LOCATION, AND CONTRACTOR PERFORMING WORK

SITE ARRIVAL: **0650** | SITE DEPARTURE: **1215**

- SAV arrived onsite and parked in the rear of the facility.
- Sampling started around 07:30. Drop Point 2 was not in operation.
- Collected grab samples at Drop Point 1 every half hour according to the sampling plan dated 3/20/25.
- Drop Point 1 ran from ~06:30-~11:30. After lunch shredder was down for maintenance the rest of the day.
- SAV composited materials at 11:45.
- SAV left site at approximately 12:15.

UNEXPECTED, UNUSUAL, OR NONCONFORMING OBSERVATIONS (NEW / RESOLVED)

Unexpected, unusual, or nonconforming work observed? ☐ **Yes** ☒ **No**

SUMMARY OF MEETINGS / DISCUSSIONS / PHONE CONVERSATIONS

Talked with Mike Wolfe about the shredder being down for maintenance after lunch and second drop pile still having mechanical issues.

MATERIALS DELIVERED/USED ONSITE

N/A

ATTACHMENTS

Chain of Custody, Photographs, Field Notes

DESCRIPTION OF SAMPLES TAKEN OR MATERIALS DELIVERED TO LAB

- Grab samples were composited according to the plan following the final grab samples. Samples were packed on ice immediately after compositing. Sample was stored in a dedicated refrigerator until shipped on 4/3/2025 via FedEx to Pace National laboratory in Mt. Juliet, TN.

FIELD REP: SAV DATE: 05/14/2025 CEC MANAGER: LDC DATE: 05/15/2025

This document is draft until reviewed and approved by a Project Manager

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Company Name/Address:

Civil & Environmental Consultants - PA

700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:

Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Report to:
Laura Campbell 800-365-2324

Email To: **lcampbell@cecinc.com**

Project Description:
Benwood Shredder Fluff

City/State Collected:

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #: ~~335-863~~ SAV 334-094

Lab Project #: **CECPPA-BENWOOD**

Collected by (print): Sarah Van Horn

Site/Facility ID #:

P.O. #:

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day ___ STD TAT

Quote #:

Date Results Needed:

Immediately Packed on Ice N ___ Y X

SDG #:

Table #:

Acctnum: **CECPPA**
Template: **T270505**
Prelogin: **P1139370**
PM: **3564 - Chad A Upchurch**
PB: 3/20/25 BK
Shipped Via: **FedEX Ground**

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres								Remarks	Sample # (lab only)
SF-4	Comp	SS		3-31-25		2			X									
SF-5	Comp	SS		4-1-25		2	X	X										
SF-6	Comp	SS		4-3-25		2												

* Matrix:
SS - Soil **AIR** - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ________

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
	4-3-25	1900			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

334-094
Benwood Facility
AMG Resources Corporation
April 01, 2025


Drop Pile 1


Drop Pile 1

4-1-25

AMG Benwood   onsite 0650

Only one shredder running today

Start 6:30

7:00	1-5 sampled
7:30	"
0800	"
0830	"
0900	"
0930	"
1000	"
1030	"
1100	"
1130	"

Stop for day

Sample 1145

offsite 12:15

DAILY FIELD REPORT

Date: 04/03/2025 (Thursday)
Page 1 of 2

PROJECT INFORMATION

PROJECT NAME:	Benwood Shredder Sampling – Permit Renewal Sampling		
LOCATION:	748 McMechen Street, Benwood, WV	CEC PROJECT NO:	334-094
PLANS AND SPECS:	NA	WEATHER:	Partly Cloudy
ISSUED DATE:	NA	TEMP. RANGE (°F)	65-75

PERSONNEL

FIELD REP(S):	Sarah Van Horn (SAV)	CEC PROJ. MANAGER(S):	Laura Campbell
CLIENT:	AMG	CLIENT CONTACT(S):	Greg Oswald
CONTRACTOR:	NA	SUPERVISOR(S):	Mary King

SAFETY MEETING PARTICIPATION

Participation in Contractor's Tailgate Safety Meeting? ☐ **Yes** ☒ **No** *Vehicle Check Performed?* ☒ **Yes or** ☐ **No**

Observed Hazards:

- Slips hazards
- Site Traffic
- Overhead hazards – AMG stopped discharge conveyor
- Dust

WORK PERFORMED SINCE CEC'S LAST VISIT(1)

Work performed since CEC representative's last site visit? (1) ☐ **Yes** ☒ **No**

Date CEC representative was last onsite: **N/A**

(1) Critical work or work requiring continuous observation that has been completed without CEC representation being present onsite. CEC was not made aware that this work was being completed.

ONSITE REPRESENTATIVES PRESENT TODAY

Mike Wolfe

SUMMARY OF WORK OBSERVED, LOCATION, AND CONTRACTOR PERFORMING WORK

SITE ARRIVAL: **0645**

SITE DEPARTURE: **1630**

- SAV arrived onsite and parked in the rear of the facility.
- Sampling started around 07:00. Drop Point 2 was not in operation.
- Collected grab samples at Drop Point 1 every half hour according to the sampling plan dated 3/20/25.
- Drop Point 1 ran from ~06:30-~10:00 then resumed form ~03:00-~15:45. Pause was for shredder maintenance.
- SAV composited materials at 16:00.
- SAV left site at approximately 16:30.

UNEXPECTED, UNUSUAL, OR NONCONFORMING OBSERVATIONS (NEW / RESOLVED)

Unexpected, unusual, or nonconforming work observed? ☐ **Yes** ☒ **No**

SUMMARY OF MEETINGS / DISCUSSIONS / PHONE CONVERSATIONS

Talked with Mike Wolfe about the shredder being down for maintenance and second drop pile still having mechanical issues.

MATERIALS DELIVERED/USED ONSITE

N/A

ATTACHMENTS

Chain of Custody, Photographs, Field Notes

DESCRIPTION OF SAMPLES TAKEN OR MATERIALS DELIVERED TO LAB

- Grab samples were composited according to the plan following the final grab samples. Samples were packed on ice immediately after compositing. All samples for the week were shipped on 4/3/2025 via FedEx to Pace National laboratory in Mt. Juliet, TN.

FIELD REP: SAV DATE: 05/14/2025 CEC MANAGER: LDC DATE: 05/15/2025

This document is draft until reviewed and approved by a Project Manager

Company Name/Address:
Civil & Environmental Consultants - PA
700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:
Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to:
Laura Campbell 800-365-2324

Email To: lcampbell@cecinc.com

Project Description:
Benwood Shredder Fluff

City/State Collected:

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project # ~~335-863~~ SAV 334-094

Lab Project # CECPPA-BENWOOD

Collected by (print): Sarah Van Horn

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day ___ STD TAT

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

SDG #

Table #

Acctnum: CECPPA
Template: T270505
Prelogin: P1139370
PM: 3564 - Chad A Upchurch
PB: 3/20/25 BK
Shipped Via: FedEX Ground

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres								Remarks	Sample # (lab only)
SF-4	Comp	SS		3-31-25		2			X									
SF-5	Comp	SS		4-1-25		2	X	X										
SF-6	Comp	SS		4-3-25		2												

* Matrix:
SS - Soil **AIR** - Air F - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ________

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)
Date: 4-3-25
Time: 1900
Received by: (Signature)
Trip Blank Received: Yes / No
HCL / MeoH
TBR

Relinquished by : (Signature)
Date:
Time:
Received by: (Signature)
Temp: °C Bottles Received:
If preservation required by Login: Date/Time

Relinquished by : (Signature)
Date:
Time:
Received for lab by: (Signature)
Date:
Time:
Hold:
Condition: NCF / OK

334-094
Benwood Facility
AMG Resources Corporation
April 03, 2025

Drop Pile 1

Drop Pile 1

4-3-25

AMG Benwood onsite 0645

only one shredder running

start 6:30

0700 1-5 sampled
0730 "
0800 "
0830 "
0900 "
0930 "
1000 "
1010 shredder down
1300 shredder start
1315 1-5 sampled
1345 "
1415 "
1445 "
1515 "
1545 "
shredder stop
sample 1600
offsite 1630

DAILY FIELD REPORT

Date: 04/08/2025 (Tuesday)
Page 1 of 2

Civil & Environmental Consultants, Inc.

PROJECT INFORMATION

PROJECT NAME:	Benwood Shredder Sampling – Permit Renewal Sampling		
LOCATION:	748 McMechen Street, Benwood, WV	CEC PROJECT NO:	334-094
PLANS AND SPECS:	NA	WEATHER:	Sunny
ISSUED DATE:	NA	TEMP. RANGE (°F)	30-40

PERSONNEL

FIELD REP(S):	Hannah Enderby (HRE)	CEC PROJ. MANAGER(S):	Laura Campbell
CLIENT:	AMG	CLIENT CONTACT(S):	Greg Oswald
CONTRACTOR:	NA	SUPERVISOR(S):	Mary King

SAFETY MEETING PARTICIPATION

Participation in Contractor's Tailgate Safety Meeting? ☐ **Yes** ☒ **No** *Vehicle Check Performed?* ☒ **Yes or** ☐ **No**

Observed Hazards:

- Slips hazards
- Site Traffic
- Overhead hazards
- Dust

WORK PERFORMED SINCE CEC'S LAST VISIT(1)

Work performed since CEC representative's last site visit? *(1)* ☐ **Yes** ☒ **No**

Date CEC representative was last onsite: **N/A**

(1) Critical work or work requiring continuous observation that has been completed without CEC representation being present onsite. CEC was not made aware that this work was being completed.

ONSITE REPRESENTATIVES PRESENT TODAY

Karl Kerstetter

SUMMARY OF WORK OBSERVED, LOCATION, AND CONTRACTOR PERFORMING WORK

SITE ARRIVAL: **06:40** SITE DEPARTURE: **16:30**

- HRE met with Karl Kerstetter for check-in at 06:40. Karl confirmed Shredder Drop Point 1 to stop around 2:30 p.m. and Drop Point 2 to stop around 3:30 p.m.
- Sampling started around 07:45 due to Plant Traffic upon CEC entrance.
- Collected grab samples at Drop Point 1 and then Drop Point 2 every half hour according to the sampling plan dated 3/20/25.
- Drop Point 1 ran from ~06:30-12:15, then resumed from ~12:45-15:30.
- Drop Point 2 ran from ~06:30-15:40.
- HRE composited materials at 16:05.
- HRE left site at approximately 16:30.

UNEXPECTED, UNUSUAL, OR NONCONFORMING OBSERVATIONS (NEW / RESOLVED)

Unexpected, unusual, or nonconforming work observed? ☐ **Yes** ☒ **No**

SUMMARY OF MEETINGS / DISCUSSIONS / PHONE CONVERSATIONS

Discussed with Plant Employee (Toni) that Grab Point 1 conveyer belt planned to end around 16:00 and Grab Point 2 to end around 15:30.

MATERIALS DELIVERED/USED ONSITE

N/A

ATTACHMENTS

Chain of Custody, Photographs, Field Notes

DESCRIPTION OF SAMPLES TAKEN OR MATERIALS DELIVERED TO LAB

- Grab samples were composited according to the plan following the final grab samples. Samples were packed on ice immediately after compositing. Samples were shipped on 4/10/2025 via FedEx to Pace National laboratory in Mt. Juliet, TN.

FIELD REP: HRE DATE: 04/14/2025 CEC MANAGER: LDC DATE: 05/15/2025

This document is draft until reviewed and approved by a Project Manager

334-094
Benwood Facility
AMG Resources Corporation
April 08, 2025

Drop Pile 1

Drop Pile 1

Drop Pile 1

Drop Pile 2

Drop Pile 2

Drop Pile 2

Company Name/Address: **Civil & Environmental Consultants - PA** 700 Cherrington Parkway Moon Township, PA 15108	Billing Information: **Accounts Payable** **700 Cherrington Parkway** **Moon Township, PA 15108**	Pres Chk	Chain of Custody Page ___ of ___
Report to: **Laura Campbell 800-365-2324**	Email To: **lcampbell@cecinc.com**		

Pace PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1846705

J146

Acctnum: **CECPPA**
Template: **T270505**
Prelogin: **P1139363**
PM: **3564 - Chad A Upchurch**
PB: CU 3/19/25
Shipped Via: **FedEX Ground**

Project Description: **Benwood Shredder Fluff**	City/State Collected:	Please Circle: PT MT CT ET
Regulatory Program(DOD,RCRA,DW,etc):	Client Project # ~~335-863~~ HRE 334-094	Lab Project # **CECPPA-BENWOOD**
Collected by (print): Hannah Enderby	Site/Facility ID #	P.O. #
Collected by (signature): Immediately Packed on Ice N ____ Y X	***Rush?*** (Lab MUST Be Notified) ____ Same Day ____ Five Day ____ Next Day ____ 5 Day (Rad Only) ____ Two Day ____ 10 Day (Rad Only) ____ Three Day ____ STD TAT	**Quote #** Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres								Remarks	Sample # (lab only)
SF-7	Comp	SS		4-8-25	1605	4 X	X	X	X									-01/02
SF-8	Comp	SS		4-9-25	1600	4x	X	X	X									03/04
SF-9	Comp	SS		4-10-25	1610	4	X	X	X									05/06

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH _______ Temp ________
Flow _______ Other ________

Samples returned via:
__ UPS __ FedEx __ Courier ___________

Tracking #

Sample Receipt Checklist ✓
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: ✓Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature) Hannah Enderby	Date: 4/10/2025	Time: 1800	Received by: (Signature)	Trip Blank Received: Yes / [✓ No] HCL / MeoH TBR	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 12	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/11/25 Time: 900	Hold:	Condition: NCF / OK

4/8/25 AMG Resources - Benwood, WV

Shredder Fluff Sampling for permit ren.

@0640 [redacted] arrived onsite + check in w/ Karl. Karl confirmed Shredder Location 1 to stop ~2:30pm and Location 2 to stop ~3:30 pm. Weather 30-40°F, snow AM.

Weather clear/sun+cloud 30-40°F

[redacted] Sampling started. Heavy truck traffic led to delay.

Note Loc 1 is closer to the truck.

cst. ft.

Time	Loc. #1 or #2		Fluff Pile Dim. LxWxH
0745	1		12 L x 12 W x 9 H
0755		2	12 L x 12 W x 12 H
0815	1		12 L x 12 W x 10 H
0825		2	12 L x 12 W x 15 H
0830	Took restroom break		
0850	1		5L x 5W x 5H
0900		2	20L x 20W x 18H
0920	1		15L x 15W x 15H
0930		2	9L x 9W x 9H
0955	1		18L x 18W x 18H
1005		2	8L x 8W x 8H
1025	1		12L x 12W x 15H
1035		2	15L x 15W x 18H
1050	Took water break/snack break		

Time	Location #1 or #2	est ft. ↘ Pile Dimensions LxWxH
1115	1	5L x 5W x 5H
1125	2 - Lost yard stick in pile	9L x 9W x 15H
1145	1	9L x 9W x 6H
1155	2	10L x 10W x 12H
1215	1 - conveyer not moving during sampling.	9L x 9W x 6H
1225	2	20L x 20W x 20H
1245	1 - conveyer moving again.	9 L x 9W x 6H
1255	2	10 L x 10W x 10H
1305	Water/restroom break	
1325	1	12L x 12W x 15H
1335	2	10L x 10W x 9H
1400	1	10L x 10W x 12H
1410	2	12L x 12W x 15H
1430	1	12L x 12W x 15H
1440	2	10L x 10W x 12H
1500	1	15L x 15W x 20H
1510	2	12L x 12W x 15H
1518	Per Tony, shredder Loc 1 ending ~4pm, & Loc. 2 should end ~3:30pm.	
1530	1 — DONE	4L x 4W x 6H
1540	2 — DONE	9L x 9W x 9H
1605	Samples composited + packed	
1630	Left Site	

4/8 Hours 0515 - 1800 (12.75 hrs)

Pg 2 of 2

DAILY FIELD REPORT

Date: 04/09/2025 (Wednesday)
Page 1 of 2

Civil & Environmental Consultants, Inc.

PROJECT INFORMATION

PROJECT NAME:	Benwood Shredder Sampling – Permit Renewal Sampling		
LOCATION:	748 McMechen Street, Benwood, WV	CEC PROJECT NO:	334-094
PLANS AND SPECS:	NA	WEATHER:	Sunny/Cloudy
ISSUED DATE:	NA	TEMP. RANGE (°F)	32-40

PERSONNEL

FIELD REP(S):	Hannah Enderby (HRE)	CEC PROJ. MANAGER(S):	Laura Campbell
CLIENT:	AMG	CLIENT CONTACT(S):	Greg Oswald
CONTRACTOR:	NA	SUPERVISOR(S):	Mary King

SAFETY MEETING PARTICIPATION

Participation in Contractor's Tailgate Safety Meeting? ☐ **Yes** ☒ **No** *Vehicle Check Performed?* ☒ **Yes or** ☐ **No**

Observed Hazards:

- Slips hazards
- Site Traffic
- Overhead hazards
- Dust

WORK PERFORMED SINCE CEC'S LAST VISIT[(1)]

Work performed since CEC representative's last site visit? [(1)] ☐ **Yes** ☒ **No**

Date CEC representative was last onsite: **N/A**

(1) Critical work or work requiring continuous observation that has been completed without CEC representation being present onsite. CEC was not made aware that this work was being completed.

ONSITE REPRESENTATIVES PRESENT TODAY

Karl Kerstetter

SUMMARY OF WORK OBSERVED, LOCATION, AND CONTRACTOR PERFORMING WORK

SITE ARRIVAL: **07:00**

SITE DEPARTURE: **16:15**

- HRE met with Karl Kerstetter for check-in at 07:00. Karl confirmed Shredder Drop Point 1 to stop around 2:30 p.m. and Drop Point 2 to stop around 3:30 p.m.
- Sampling started around 07:30.
- Collected grab samples at Drop Point 1 and then Drop Point 2 every half hour according to the sampling plan dated 3/20/25.
- Drop Point 1 ran from ~06:30-12:00, then resumed from ~13:35-15:05.
- Drop Point 2 ran from ~08:45-14:15.
- HRE composited materials at 16:00.
- HRE left site at approximately 16:15.

UNEXPECTED, UNUSUAL, OR NONCONFORMING OBSERVATIONS (NEW / RESOLVED)

Unexpected, unusual, or nonconforming work observed? ☐ **Yes** ☒ **No**

SUMMARY OF MEETINGS / DISCUSSIONS / PHONE CONVERSATIONS

N/A

MATERIALS DELIVERED/USED ONSITE

N/A

ATTACHMENTS

Chain of Custody, Photographs, Field Notes

DESCRIPTION OF SAMPLES TAKEN OR MATERIALS DELIVERED TO LAB

- Grab samples were composited according to the plan following the final grab samples. Samples were packed on ice immediately after compositing. Samples were shipped on 4/10/2025 via FedEx to Pace National laboratory in Mt. Juliet, TN.

FIELD REP: HRE DATE: 04/14/2025 CEC MANAGER: LDC DATE: 05/15/2025

This document is draft until reviewed and approved by a Project Manager

* No representations or warranties are made regarding the accuracy of the information generated by the Theodolite application, which is stamped on the photo, or the suitability of that information for any; legal, engineering, surveying, or other use or purpose.

Company Name/Address:

Civil & Environmental Consultants - PA

700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:

Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Report to:
Laura Campbell 800-365-2324

Email To: lcampbell@cecinc.com

Project Description:
Benwood Shredder Fluff

City/State Collected:

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project # ~~335-863~~ SAV 334-094

Lab Project # **CECPPA-BENWOOD**

Collected by (print): Sarah Van Horn

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day ___ STD TAT

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

Chain of Custody Page 1 of 1

Pace® PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG #

Table #

Acctnum: **CECPPA**

Template: **T270505**

Prelogin: **P1139370**

PM: **3564 - Chad A Upchurch**

PB: 3/20/25 BK

Shipped Via: **FedEX Ground**

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres	Remarks	Sample # (lab only)
SF-4	Comp	SS		3-31-25		2			X		
SF-5	Comp	SS		4-1-25		2	X	X			
SF-6	Comp	SS		4-3-25		2					

* Matrix:
SS - Soil **AIR** - Air F - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ________

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Relinquished by : (Signature)	Date: 4-3-25	Time: 1900	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

334-094
Benwood Facility
AMG Resources Corporation
April 09, 2025

Drop Pile 1

Drop Pile 1

Drop Pile 1

Drop Pile 2

Drop Pile 2

Drop Pile 2

Shredder Fluff sampling for permit renewal

@0700 HRE arrived onsite & checked in w/ Karl.
@0730 Sampling started
Weather clear sun+cloud 32–40°F.

Time	Location 1 or 2	LxWxH Dimensions (ft)
0730	1	12L x 12W x 12H
0740	2 - Shredder has not started. Crane operator est. will start ~0815.	
0805	1	12L x 12W x 15H
0815	2 - Not operating	
0835	1	18L x 18W x 18H
0845	2	12L x 12W x 9H
0910	1	15L x 15W x 12H
0920	2	18L x 18W x 18H
0945	1	15L x 15W x 15H
0955	2 - conveyor belt running but no fluff coming off + no pile to sample.	
1015	1	18L x 18W x 18H
1025	2	15L x 15W x 15H
1045	1	18L x 18W x 18H
1055	2	15L x 15W x 10H
1120	1	18L x 18W x 18H
1130	2	15L x 15W x 15H
1140	Restroom break	
1200	1 - Not operating.	
1205	2	9L x 9W x 6H

Pg 1 of 2

38Time	Loc. #1 or #2	L×W×H Dimensions (ft)
1230	1 - Not operating	
1235	2	15L × 15W × 12H
1305	1 - Not operating	
1310	2	9L × 9W × 6H
1335	1	10L × 10W × 12H
1345	2	9L × 9W × 9H
1405	1	15L × 15W × 15H
1415	2 - Not operating	
1435	1	12L × 12W × 9H
1445	2 - Not operating	
1505	1 - Done	12L × 12W × 12H
1515	2 - Not operating	
1535	2 - Done	20L × 20W × 15H
1600	Packed samples	
1615	Left site - H&E	

4/9 Hours 0515 - 1830 (13.25 hrs)

Pg 2 of 2

DAILY FIELD REPORT

Date: 04/10/2025 (Thursday)

Civil & Environmental Consultants, Inc.

PROJECT INFORMATION

PROJECT NAME:	Benwood Shredder Sampling – Permit Renewal Sampling		
LOCATION:	748 McMechen Street, Benwood, WV	CEC PROJECT NO:	334-094
PLANS AND SPECS:	NA	WEATHER:	Rain
ISSUED DATE:	NA	TEMP. RANGE (°F)	42-52

PERSONNEL

FIELD REP(S):	Hannah Enderby (HRE)	CEC PROJ. MANAGER(S):	Laura Campbell
CLIENT:	AMG	CLIENT CONTACT(S):	Greg Oswald
CONTRACTOR:	NA	SUPERVISOR(S):	Mary King

SAFETY MEETING PARTICIPATION

Participation in Contractor's Tailgate Safety Meeting? ☐ **Yes** ☒ **No** *Vehicle Check Performed?* ☒ **Yes or** ☐ **No**

Observed Hazards:

- Slips hazards
- Site Traffic
- Overhead hazards
- Dust

WORK PERFORMED SINCE CEC'S LAST VISIT(1)

Work performed since CEC representative's last site visit? (1) ☐ **Yes** ☒ **No**

Date CEC representative was last onsite: **N/A**

(1) Critical work or work requiring continuous observation that has been completed without CEC representation being present onsite. CEC was not made aware that this work was being completed.

ONSITE REPRESENTATIVES PRESENT TODAY

Karl Kerstetter

SUMMARY OF WORK OBSERVED, LOCATION, AND CONTRACTOR PERFORMING WORK

SITE ARRIVAL: **06:50** | SITE DEPARTURE: **17:05**

- HRE met with Karl Kerstetter for check-in at 06:50. Karl confirmed Shredder Drop Point 2 will be down the entire day, but Drop Point 1 was scheduled to run during the late morning/afternoon.
- HRE checked Drop Point 1 from 07:45 through 12:30 and confirmed that the conveyer belt was not operating at each check-in. HRE also checked Drop Point 2 at 07:50 to confirm not in operation. At ~07:50, Mike confirmed that Drop Point 2 would be down the entire day, and Drop Point 1 to start sometime in the afternoon.
- Sampling at Drop Point 1 started around 13:00.
- Collected grab samples at Drop Point 1 according to the sampling plan dated 3/20/25.
- Drop Point 1 ran from ~13:00-15:50.
- HRE composited materials at 16:10 and packaged for shipment via FedEx.
- HRE left site at approximately 17:05.

UNEXPECTED, UNUSUAL, OR NONCONFORMING OBSERVATIONS (NEW / RESOLVED)

Unexpected, unusual, or nonconforming work observed? ☐ **Yes** ☒ **No**

SUMMARY OF MEETINGS / DISCUSSIONS / PHONE CONVERSATIONS

N/A

MATERIALS DELIVERED/USED ONSITE

N/A

ATTACHMENTS

Chain of Custody, Photographs, Field Notes

DESCRIPTION OF SAMPLES TAKEN OR MATERIALS DELIVERED TO LAB

- Grab samples were composited according to the plan following the final grab samples. Samples were packed on ice immediately after compositing. Samples were shipped on 4/10/2025 via FedEx to Pace National laboratory in Mt. Juliet, TN.

FIELD REP: HRE DATE: 04/14/2025 CEC MANAGER: LDC DATE: 05/15/2025

This document is draft until reviewed and approved by a Project Manager

Company Name/Address:

Civil & Environmental Consultants - PA

700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:

Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to:
Laura Campbell 800-365-2324

Email To: lcampbell@cecinc.com

Project Description:
Benwood Shredder Fluff

City/State Collected:

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
~~335-803~~ SAV
334-094

Lab Project #
CECPPA-BENWOOD

Collected by (print):
Sarah Van Horn

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day ___ STD TAT

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

SDG #

Table #

Acctnum: **CECPPA**
Template: **T270505**
Prelogin: **P1139370**
PM: 3564 - Chad A Upchurch
PB: 3/20/25 BK
Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres	Remarks	Sample # (lab only)
SF-4	Comp	SS		3-31-25		2			X		
SF-5	Comp	SS		4-1-25		2	X	X			
SF-6	Comp	SS		4-3-25		2					

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ________

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Relinquished by : (Signature)	Date: 4-3-25	Time: 1900	Received by: (Signature)	Temp: °C Bottles Received:	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold:

Condition: NCF / OK

334-094
Benwood Facility
AMG Resources Corporation
April 10, 2025

Drop Pile 1

Drop Pile 2

Drop Pile 2

Drop Pile 2

4/10/25 AMG Resources - Benwood, WV

Shredder Fluff Sampling for permit renewal

@ 0650 HRE arrived onsite + check in w/ Karl. *Karl noted that the shredder will be down most of the day but the downstream will be operating as normal starting around 0900. ← Per Mike
Weather rain + 42-52°F.

@ 0745 Sampling started at Loc 1. Will resume once Loc 1 starts up.

Time	Loc #1 or #2	Dimensions (ft) LxWxH
0745	1 - Not operating. Per Mike will start ~0900. Sampled pile.	8L x 8W x 5H
0830	Confirmed Shredder #1 still down.	
0911	"	
0934	"	
1000	"	
1035	" confirmed w/ Mike that shredder should start in the next hour or 2.	
1130	" Not operating	
1200	" Not o	
1230	"	
1300	1 - Started sampling	8L x 8W x 5H
1330	1	10L x 10W x 10H

Pg 1 of 2

Time	LOC. #1 or #2	Dimensions (ft) LxWxH
1400	1 - Per Mike, operating until ~4pm today.	10L x 10W x 6H
1430	1	10L x 10W x 5H
1500	1	12L x 12W x 8H
1530	1	12L x 12W x 8H
1600	1	
1610	Samples composited + packaged.	
1705	Left site	

Pg 2 of 2

DAILY FIELD REPORT

Date: 04/15/2025 (Tuesday)
Page 1 of 2

PROJECT INFORMATION

PROJECT NAME:	Benwood Shredder Sampling – Permit Renewal Sampling		
LOCATION:	748 McMechen Street, Benwood, WV	CEC PROJECT NO:	334-094
PLANS AND SPECS:	NA	WEATHER:	Partly Cloudy
ISSUED DATE:	NA	TEMP. RANGE (°F)	45-50

PERSONNEL

FIELD REP(S):	Sarah Van Horn (SAV)	CEC PROJ. MANAGER(S):	Laura Campbell
CLIENT:	AMG	CLIENT CONTACT(S):	Greg Oswald
CONTRACTOR:	NA	SUPERVISOR(S):	Mary King

SAFETY MEETING PARTICIPATION

Participation in Contractor's Tailgate Safety Meeting? ☐ **Yes** ☒ **No** *Vehicle Check Performed?* ☒ **Yes or** ☐ **No**

Observed Hazards:

- Slips hazards
- Site Traffic
- Overhead hazards – AMG stopped discharge conveyor
- Dust

WORK PERFORMED SINCE CEC'S LAST VISIT(1)

Work performed since CEC representative's last site visit? (1) ☐ **Yes** ☒ **No**

Date CEC representative was last onsite: **N/A**

(1) Critical work or work requiring continuous observation that has been completed without CEC representation being present onsite. CEC was not made aware that this work was being completed.

ONSITE REPRESENTATIVES PRESENT TODAY

Mike Wolfe

SUMMARY OF WORK OBSERVED, LOCATION, AND CONTRACTOR PERFORMING WORK

SITE ARRIVAL: **0700**	SITE DEPARTURE: **1610**

- SAV arrived onsite and parked in the rear of the facility.
- Sampling started around 08:00 at Drop Point 1. Drop Point 2 was not in operation.
- Drop Point 2 started at 10:00 and stopped at 10:15, one grab sample was collected before machine maintenance was needed.
- Collected grab samples at Drop Point 1 every half hour according to the sampling plan dated 3/20/25.
- Drop Point 1 ran from ~07:30-~11:30 then resumed form ~12:30-~15:30. Pause was for lunch break.
- SAV composited materials at 15:50.
- SAV left site at approximately 16:10.

UNEXPECTED, UNUSUAL, OR NONCONFORMING OBSERVATIONS (NEW / RESOLVED)

Unexpected, unusual, or nonconforming work observed? ☐ **Yes** ☒ **No**

SUMMARY OF MEETINGS / DISCUSSIONS / PHONE CONVERSATIONS

Talked with Mike Wolfe about the shredder being down for lunch and second drop pile still having mechanical issues.

MATERIALS DELIVERED/USED ONSITE

N/A

ATTACHMENTS

Chain of Custody, Photographs, Field Notes

DESCRIPTION OF SAMPLES TAKEN OR MATERIALS DELIVERED TO LAB

- Grab samples were composited according to the plan following the final grab samples. Samples were packed on ice immediately after compositing. Sample was kept in a dedicated refrigerator until shipped on 4/17/2025 via FedEx to Pace National laboratory in Mt. Juliet, TN.

FIELD REP: SAV DATE: 05/15/2025 CEC MANAGER: LDC DATE: 05/20/2025

This document is draft until reviewed and approved by a Project Manager

Company Name/Address:
Civil & Environmental Consultants - PA

700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:
Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Email To: **lcampbell@cecinc.com**

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to:
Laura Campbell 800-365-2324

Project Description:
Benwood Shredder Fluff

City/State Collected: Benwood WV

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
335-863

Lab Project #
CECPPA-BENWOOD

Collected by (print): SV HE

Site/Facility ID #

P.O. #

Collected by (signature):

Quote #

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day ___ STD TAT

Date Results Needed

Immediately Packed on Ice N ___ Y X

SDG #

Table #

Acctnum: **CECPPA**
Template: **T270505**
Prelogin: **P1139369**
PM: 3564 - Chad A Upchurch
PB: 3/20/25 BK
Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Pres Chk	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres	Remarks	Sample # (lab only)
SF-10	Comp	SS	NA	4-15-25	1550	2				X		
SF-10	Comp	SS	NA	4-15-25	1550	2		X	X			

Analysis / Container / Preservative

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ________

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date: 4-15-25	Time: 1730	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

334-094
Benwood Facility
AMG Resources Corporation
April 15, 2025

Drop Pile 1

Drop Pile 2

Drop Pile 2

Company Name/Address:

Civil & Environmental Consultants - PA

700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:

Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to:
Laura Campbell 800-365-2324

Email To: lcampbell@cecinc.com

Please Circle: PT MT CT ET

Project Description:
Benwood Shredder Fluff

City/State Collected: Benwood WV

Lab Project #
CECPPA-BENWOOD

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
335-863

SDG #

Table #

Collected by (print):
SV HE

Site/Facility ID #

P.O. #

Acctnum: CECPPA
Template: T270505
Prelogin: P1139369
PM: 3564 - Chad A Upchurch
PB: 3/20/25 BK
Shipped Via: FedEX Ground

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
- ___ Same Day
- ___ Next Day
- ___ Two Day
- ___ Three Day
- ___ Five Day
- ___ 5 Day (Rad Only)
- ___ 10 Day (Rad Only)
- ___ STD TAT

Quote #

Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres							Remarks	Sample # (lab only)
SF-10	Comp	SS	NA	4-15-25	1550	2			X								
SF-10	Comp	SS	NA	4-15-25	1550	2	X	X									

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ________

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date: 4-15-25	Time: 1730	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

DAILY FIELD REPORT

Date: 04/22/2025 (Tuesday)

Page 1 of 2

Civil & Environmental Consultants, Inc.

PROJECT INFORMATION

PROJECT NAME:	Benwood Shredder Sampling – Permit Renewal Sampling		
LOCATION:	748 McMechen Street, Benwood, WV	CEC PROJECT NO:	334-094
PLANS AND SPECS:	NA	WEATHER:	Sunny/Cloudy
ISSUED DATE:	NA	TEMP. RANGE (°F)	50-70

PERSONNEL

FIELD REP(S):	Hannah Enderby (HRE)	CEC PROJ. MANAGER(S):	Laura Campbell
CLIENT:	AMG	CLIENT CONTACT(S):	Greg Oswald
CONTRACTOR:	NA	SUPERVISOR(S):	Mary King

SAFETY MEETING PARTICIPATION

Participation in Contractor's Tailgate Safety Meeting? ☐ **Yes** ☒ **No** *Vehicle Check Performed?* ☒ **Yes or** ☐ **No**

Observed Hazards:

- Slips hazards
- Site Traffic
- Overhead hazards
- Dust

WORK PERFORMED SINCE CEC'S LAST VISIT(1)

Work performed since CEC representative's last site visit? (1) ☐ **Yes** ☒ **No**

Date CEC representative was last onsite: **N/A**

(1) Critical work or work requiring continuous observation that has been completed without CEC representation being present onsite. CEC was not made aware that this work was being completed.

ONSITE REPRESENTATIVES PRESENT TODAY

Karl Kerstetter

SUMMARY OF WORK OBSERVED, LOCATION, AND CONTRACTOR PERFORMING WORK

SITE ARRIVAL: **06:46**

SITE DEPARTURE: **16:20**

- HRE checked in at main office at 06:46. Jimmy confirmed Shredder Drop Point 1 (NFR Plant) to stop around 3:30 p.m. and Drop Point 2 to stop around 3:45 p.m.
- Sampling started around 07:25.
- Collected grab samples at Drop Point 1 and then Drop Point 2 every half hour according to the sampling plan dated 3/20/25.
- Drop Point 1 ran from ~06:30-15:30.
- Drop Point 2 ran from ~06:30-15:45.
- HRE composited materials at 15:50.
- HRE left site at approximately 16:20.

UNEXPECTED, UNUSUAL, OR NONCONFORMING OBSERVATIONS (NEW / RESOLVED)

Unexpected, unusual, or nonconforming work observed? ☐ **Yes** ☒ **No**

SUMMARY OF MEETINGS / DISCUSSIONS / PHONE CONVERSATIONS

N/A

MATERIALS DELIVERED/USED ONSITE

N/A

ATTACHMENTS

Chain of Custody, Photographs, Field Notes

DESCRIPTION OF SAMPLES TAKEN OR MATERIALS DELIVERED TO LAB

- Grab samples were composited according to the plan following the final grab samples. Samples were packed on ice immediately after compositing. Samples were shipped on 4/23/2025 via FedEx to Pace National laboratory in Mt. Juliet, TN.

FIELD REP: HRE DATE: 04/22/2025 CEC MANAGER: LDC DATE: 05/15/2025

This document is draft until reviewed and approved by a Project Manager

---

Company Name/Address:
Civil & Environmental Consultants - PA

700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:
Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at:
https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to:
Laura Campbell 800-365-2324

Email To: **lcampbell@cecinc.com**

Project Description:
Benwood Shredder Fluff

City/State Collected: Benwood WV

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
~~335-863~~ SAV
334-094

Lab Project #
CECPPA-BENWOOD

SDG # L1851474

1034

Acctnum: **CECPPA**
Template: **T270505**
Prelogin: **P1139365**
PM: **3564 - Chad A Upchurch**
PB: 3/20/25 BK
Shipped Via: **FedEX Ground**

Collected by (print): HE SAV

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ____

Rush? (Lab MUST Be Notified)
____ Same Day X Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day ____ STD TAT

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres							Remarks	Sample # (lab only)
SF-11	C	SS		4/22/24	1550	2			X								-01
↑	C	SS		↑	↑	2	X	X									-02
SF-12	C	SS		4-23-25	1615	2			X								-03
SF-12	C	SS		4-23-25	1615	2	X	X									-04

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS X FedEx __ Courier ________

Tracking # 4439 2445 8723

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: ✓Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature)
Date: 4-23-25
Time: 1830
Received by: (Signature)

Trip Blank Received: [✓ Yes] / No
[✓ HCL] / MeoH
TBR
1

Relinquished by : (Signature)
Date:
Time:
Received by: (Signature)

Temp: °C
TM6 1.9+0.4=2.3
Bottles Received: 8

If preservation required by Login: Date/Time

Relinquished by : (Signature)
Date:
Time:
Received for lab by: (Signature)

Date: 4-24-25
Time: 0845

Hold:

Condition:
NCF / [✓ OK]

334-094
Benwood Facility
AMG Resources Corporation
April 22, 2025

Drop Pile 1

Drop Pile 1

Drop Pile 1

Drop Pile 2

Drop Pile 2

Drop Pile 2

4/22/25 AMG Resources – Benwood, WV

Shredder Fluff sampling for permit ren.

@ 0646 HRI arrived onsite & check in at main office w/ Jimmy (Karl not present). Per Jimmy, NFR plant (aka Location #1) will stop around 15:30 and main one to stop around 15:45.

@ 0725 Sampling initiated. Weather dry 50-70°F.

Time	Loc 1 or 2	ft Dimensions (LxWxH)
@ 0725	1	6L x 6W x 3H
@ 0735	2	20L x 20W x 18H
Restroom break		
@ 0805	1	8L x 8W x 5H
@ 0815	2	8L x 8W x 6H
@ 0835	1	8L x 8W x 6H
@ 0845	2	3L x 3W x 3H
@ 0905	1	6L x 6W x 4H
@ 0915	2 – Belt not running. DNS.	
@ 0945	1	18L x 18W x 10H
@ 0955	2 – Belt not running. DNS.	
@ 1020	1	12L x 12W x 10H
@ 1030	2	18L x 18W x 10H

Time	Location 1 or 2		ft Dimensions LxWxH
@1050	1		12L x 12W x 8H
@ 1100		2	18L x 18W x 12H
@ 1120	1		12L x 12W x 10H
@ 1130		2	6L x 6W x 4H
@ 1150	1		10L x 10W x 5H
@ 1200		2- Belt not moving. DNS.	
Lunch Break			
@ 1235	1		12L x 12W x 8H
@1245		2	15L x 15W x 12H
@ 1310	1		12L X 12W x 8H
@ 1320		2	18L x 18W x 18H
@1340	1		12L x 12W x 10H
@ 1350		2	9L x 9W x 5H
@ 1415	1		10L x 10W x 8H
@1425		2	15L x 15W x 12H
@ 1450	1		5L x 5W x 4H
@ 1510		2	15L x 15W x 10H
@ 1525	1 - End		8L x 8W x 10H
@ 1535		2 - End	6L x 6W x 4H
@ 1550	Samples composited		
@ 1620	HRE left site		

DAILY FIELD REPORT

Date: 04/23/2025 (Wednesday)
Page 1 of 2

Civil & Environmental Consultants, Inc.

PROJECT INFORMATION

PROJECT NAME:	Benwood Shredder Sampling – Permit Renewal Sampling		
LOCATION:	748 McMechen Street, Benwood, WV	CEC PROJECT NO:	334-094
PLANS AND SPECS:	NA	WEATHER:	Partly Cloudy
ISSUED DATE:	NA	TEMP. RANGE (°F)	50-75

PERSONNEL

FIELD REP(S):	Sarah Van Horn (SAV)	CEC PROJ. MANAGER(S):	Laura Campbell
CLIENT:	AMG	CLIENT CONTACT(S):	Greg Oswald
CONTRACTOR:	NA	SUPERVISOR(S):	Mary King

SAFETY MEETING PARTICIPATION

Participation in Contractor's Tailgate Safety Meeting? ☐ **Yes** ☒ **No** *Vehicle Check Performed?* ☒ **Yes or** ☐ **No**

Observed Hazards:

- Slips hazards
- Site Traffic
- Overhead hazards – AMG stopped discharge conveyor
- Dust

WORK PERFORMED SINCE CEC'S LAST VISIT(1)

Work performed since CEC representative's last site visit? (1) ☐ **Yes** ☒ **No**
Date CEC representative was last onsite: **N/A**

(1) Critical work or work requiring continuous observation that has been completed without CEC representation being present onsite. CEC was not made aware that this work was being completed.

ONSITE REPRESENTATIVES PRESENT TODAY

Mike Wolfe

SUMMARY OF WORK OBSERVED, LOCATION, AND CONTRACTOR PERFORMING WORK

SITE ARRIVAL: **0700** SITE DEPARTURE: **1630**

- SAV arrived onsite and parked in the rear of the facility.
- Sampling started around 07:15.
- Collected grab samples at Drop Point 1 and Drop Point 2 every half hour according to the sampling plan dated 3/20/25.
- Drop Point 1 ran from ~06:45-~10:15 then resumed from ~10:30-~10:50. Pause was for mechanical issues.
- Drop Point 2 ran from ~06:45-~10:00 then resumed from ~11:45-~15:45. Pause was for mechanical issues.
- SAV composited materials at 16:00.
- SAV left site at approximately 16:30.

UNEXPECTED, UNUSUAL, OR NONCONFORMING OBSERVATIONS (NEW / RESOLVED)

Unexpected, unusual, or nonconforming work observed? ☐ **Yes** ☒ **No**

SUMMARY OF MEETINGS / DISCUSSIONS / PHONE CONVERSATIONS

Talked with Mike Wolfe about the shredders being down for having mechanical issues.

MATERIALS DELIVERED/USED ONSITE

N/A

ATTACHMENTS

Chain of Custody, Photographs, Field Notes

DESCRIPTION OF SAMPLES TAKEN OR MATERIALS DELIVERED TO LAB

- Grab samples were composited according to the plan following the final grab samples. Samples were packed on ice immediately after compositing. All samples for the week were shipped on 4/23/2025 via FedEx to Pace National laboratory in Mt. Juliet, TN.

FIELD REP: SAV DATE: 05/15/2025 CEC MANAGER: LDC DATE: 05/20/2025

This document is draft until reviewed and approved by a Project Manager

Company Name/Address:
Civil & Environmental Consultants - PA

700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:
Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Chain of Custody Page 1 of 1

Pace PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to:
Laura Campbell 800-365-2324

Email To: lcampbell@cecinc.com

Project Description:
Benwood Shredder Fluff

City/State Collected: Benwood WV

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project # ~~335-869~~ SAV 334-094

Lab Project # CECPPA-BENWOOD

Site/Facility ID #

P.O. #

Collected by (print): HE SAV

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day X Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day ___ STD TAT

Quote #

Date Results Needed

SDG #

Table #

Acctnum: CECPPA
Template: T270505
Prelogin: P1139365
PM: 3564 - Chad A Upchurch
PB: 3/20/25 BK
Shipped Via: FedEx Ground

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres							Remarks	Sample # (lab only)
SF-11	C	SS		4/22/24	1550	2			X								
↑	C	SS		↑	↑	2	X	X									
SF-12	C	SS		4-23-25	1615	2			X								
SF-12	C	SS		4-23-25	1615	2	X	X									

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS X FedEx __ Courier ________

Tracking #

Sample Receipt Checklist
COC **Seal Present/Intact:** _NP _Y _N
COC Signed/Accurate: _Y _N
Bottles arrive intact: _Y _N
Correct bottles used: _Y _N
Sufficient volume sent: _Y _N
If Applicable
VOA Zero Headspace: _Y _N
Preservation Correct/Checked: _Y _N
RAD Screen <0.5 mR/hr: _Y _N

Relinquished by : (Signature)	Date: 4-23-25	Time: 1830	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

334-094
Benwood Facility
AMG Resources Corporation
April 23, 2025

Drop Pile 1

Drop Pile 1

Drop Pile 2

4-23-25
Amb Benwood
Onsite 0700

Shredder 1 start
Shredder 2 start

0715 1-10 samples collected
0745 "
0815 "
0845 "
0915 "
0945 "
Shredder 2 stopped running
1015 1-5 samples collected
Shredder 1 stopped running
1030 Shredder 1 starts up
1045 1-5 sample collected
1050 shredder 1 stopped
1115 both shredders-down
1145 shredder 2 started
shredder 1 done for the day
1215 6-10 samples collected
1245 "
1315 "
1345 "
1415 "
1445 "

1515 "
1530 shredder stop
1545 6-10 samples collected
1600 sample composite
1615 sampling
offsite 1630

ATTACHMENT B

LABORATORY ANALYTICAL RESULTS

ANALYTICAL REPORT

May 14, 2025

Revised Report

Civil & Environmental Consultants - PA

Sample Delivery Group:	L1841389
Samples Received:	03/28/2025
Project Number:	335-863
Description:	Benwood Shredder Fluff
Site:	AMG
Report To:	Laura Campbell 700 Cherrington Parkway Moon Township, PA 15108

Entire Report Reviewed By:

Chad A Upchurch
Project Manager

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

TABLE OF CONTENTS

SAMPLE SUMMARY

SF-1 L1841389-01

Collected by	Collected date/time	Received date/time
Sarah Van Horn	03/25/25 16:00	03/28/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG2479808	1	03/31/25 12:32	03/31/25 12:32	BTP	Mt. Juliet, TN
Preparation by Method 1311	WG2480161	1	03/31/25 14:40	03/31/25 14:40	JWS	Mt. Juliet, TN
Mercury by Method 7470A	WG2480617	1	04/01/25 09:21	04/01/25 15:12	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2480646	1	04/01/25 10:05	04/01/25 13:28	BAG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2481237	1	04/06/25 05:41	04/06/25 05:41	JHH	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG2482106	1	04/04/25 19:00	04/08/25 06:57	JCH	Mt. Juliet, TN

SF-1 L1841389-02

Collected by	Collected date/time	Received date/time
Sarah Van Horn	03/25/25 16:00	03/28/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2509891	1	05/08/25 09:21	05/08/25 09:30	CMB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2483901	500	04/01/25 16:29	04/06/25 20:22	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG2481070	1000	04/02/25 06:52	04/02/25 18:27	JAS	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2481134	12.5	04/02/25 06:23	04/03/25 02:56	MEW	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2481134	12.5	04/02/25 06:23	04/03/25 20:01	MEW	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chad A Upchurch
Project Manager

Report Revision History

Level II Report - Version 1: 04/08/25 22:38

Project Narrative

L1841389-02: Reported on a dry weight corrected basis, per request.

SF-1

Collected date/time: 03/25/25 16:00

SAMPLE RESULTS - 01

L1841389

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		3/31/2025 2:40:54 PM	WG2480161
TCLP ZHE Extraction	-		3/31/2025 12:32:14 PM	WG2479808
Initial pH	8.64		3/31/2025 2:40:54 PM	WG2480161
Final pH	5.22		3/31/2025 2:40:54 PM	WG2480161

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/01/2025 15:12	WG2480617

Metals (ICP) by Method 6010D

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	04/01/2025 13:28	WG2480646
Barium	0.713		0.100	100	1	04/01/2025 13:28	WG2480646
Cadmium	0.144		0.100	1	1	04/01/2025 13:28	WG2480646
Chromium	ND		0.100	5	1	04/01/2025 13:28	WG2480646
Lead	0.356		0.100	5	1	04/01/2025 13:28	WG2480646
Selenium	ND		0.100	1	1	04/01/2025 13:28	WG2480646
Silver	ND		0.100	5	1	04/01/2025 13:28	WG2480646

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/06/2025 05:41	WG2481237
Carbon tetrachloride	ND		0.0500	0.50	1	04/06/2025 05:41	WG2481237
Chlorobenzene	ND		0.0500	100	1	04/06/2025 05:41	WG2481237
Chloroform	ND		0.250	6	1	04/06/2025 05:41	WG2481237
1,2-Dichloroethane	ND		0.0500	0.50	1	04/06/2025 05:41	WG2481237
1,1-Dichloroethene	ND		0.0500	0.70	1	04/06/2025 05:41	WG2481237
2-Butanone (MEK)	ND	C3 J3	0.500	200	1	04/06/2025 05:41	WG2481237
Tetrachloroethene	ND		0.0500	0.70	1	04/06/2025 05:41	WG2481237
Trichloroethene	ND		0.0500	0.50	1	04/06/2025 05:41	WG2481237
Vinyl chloride	ND		0.0500	0.20	1	04/06/2025 05:41	WG2481237
(S) Toluene-d8	*101*		*80.0-120*			*04/06/2025 05:41*	WG2481237
(S) 4-Bromofluorobenzene	*97.0*		*77.0-126*			*04/06/2025 05:41*	WG2481237
(S) 1,2-Dichloroethane-d4	*102*		*70.0-130*			*04/06/2025 05:41*	WG2481237

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/08/2025 06:57	WG2482106
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/08/2025 06:57	WG2482106
Hexachlorobenzene	ND		0.100	0.13	1	04/08/2025 06:57	WG2482106
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/08/2025 06:57	WG2482106
Hexachloroethane	ND		0.100	3	1	04/08/2025 06:57	WG2482106
Nitrobenzene	ND		0.100	2	1	04/08/2025 06:57	WG2482106
Pyridine	ND		0.100	5	1	04/08/2025 06:57	WG2482106
3&4-Methyl Phenol	ND		0.100	400	1	04/08/2025 06:57	WG2482106
2-Methylphenol	ND		0.100	200	1	04/08/2025 06:57	WG2482106
Pentachlorophenol	ND		0.100	100	1	04/08/2025 06:57	WG2482106
2,4,5-Trichlorophenol	ND		0.100	400	1	04/08/2025 06:57	WG2482106
2,4,6-Trichlorophenol	ND		0.100	2	1	04/08/2025 06:57	WG2482106
(S) 2-Fluorophenol	*35.6*		*10.0-120*			*04/08/2025 06:57*	WG2482106

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
(S) Phenol-d5	*24.3*		*10.0-120*			*04/08/2025 06:57*	WG2482106
(S) Nitrobenzene-d5	*77.7*		*10.0-127*			*04/08/2025 06:57*	WG2482106
(S) 2-Fluorobiphenyl	*59.3*		*10.0-130*			*04/08/2025 06:57*	WG2482106
(S) 2,4,6-Tribromophenol	*56.5*		*10.0-155*			*04/08/2025 06:57*	WG2482106
(S) p-Terphenyl-d14	*54.8*		*10.0-128*			*04/08/2025 06:57*	WG2482106

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	74.2	T8	1	05/08/2025 09:30	WG2509891

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	418		70.9	500	04/06/2025 20:22	WG2483901
(S) a,a,a-Trifluorotoluene(FID)	*100*		*77.0-120*		*04/06/2025 20:22*	WG2483901

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	11100		5390	1000	04/02/2025 18:27	WG2481070
C28-C40 Oil Range	16000		5390	1000	04/02/2025 18:27	WG2481070
(S) o-Terphenyl	*0.000*	J7	*18.0-148*		*04/02/2025 18:27*	WG2481070

Polychlorinated Biphenyls (GC) by Method 8082 A

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.573	12.5	04/03/2025 02:56	WG2481134
PCB 1221	ND		0.573	12.5	04/03/2025 02:56	WG2481134
PCB 1232	ND		0.573	12.5	04/03/2025 02:56	WG2481134
PCB 1242	7.65		0.573	12.5	04/03/2025 20:01	WG2481134
PCB 1248	ND		0.287	12.5	04/03/2025 02:56	WG2481134
PCB 1254	1.70		0.287	12.5	04/03/2025 20:01	WG2481134
PCB 1260	ND		0.287	12.5	04/03/2025 02:56	WG2481134
(S) Decachlorobiphenyl	*37.7*		*10.0-135*		*04/03/2025 02:56*	WG2481134
(S) Decachlorobiphenyl	*37.1*		*10.0-135*		*04/03/2025 20:01*	WG2481134
(S) Tetrachloro-m-xylene	*38.7*		*10.0-139*		*04/03/2025 20:01*	WG2481134
(S) Tetrachloro-m-xylene	*32.9*		*10.0-139*		*04/03/2025 02:56*	WG2481134

Sample Narrative:

L1841389-02 WG2481134: Dilution due to matrix impact during extraction procedure

Method Blank (MB)

(MB) R4212182-1 05/08/25 09:30

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00200			

L1854025-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1854025-07 05/08/25 09:30 • (DUP) R4212182-3 05/08/25 09:30

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	77.2	76.4	1	0.973		10

Laboratory Control Sample (LCS)

(LCS) R4212182-2 05/08/25 09:30

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	90.0-110	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4193793-1 04/01/25 14:10

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Mercury	U		0.00333	0.0100

Laboratory Control Sample (LCS)

(LCS) R4193793-2 04/01/25 14:13

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Mercury	0.0300	0.0252	83.9	80.0-120	

L1839873-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1839873-02 04/01/25 14:15 • (MS) R4193793-4 04/01/25 14:21 • (MSD) R4193793-5 04/01/25 14:24

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Mercury	0.0300	ND	0.0271	0.0251	90.5	83.5	1	75.0-125			8.01	20

L1841294-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841294-02 04/01/25 14:27 • (MS) R4193793-6 04/01/25 14:32 • (MSD) R4193793-7 04/01/25 14:40

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Mercury	0.0300	ND	0.0302	0.0290	101	96.8	1	75.0-125			3.99	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4193686-1 04/01/25 12:52

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.0333	0.100
Barium	U		0.0333	0.100
Cadmium	U		0.0333	0.100
Chromium	U		0.0333	0.100
Lead	U		0.0333	0.100
Selenium	0.0514	J	0.0333	0.100
Silver	U		0.0333	0.100

Laboratory Control Sample (LCS)

(LCS) R4193686-2 04/01/25 12:54

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	10.0	10.2	102	80.0-120	
Barium	10.0	10.4	104	80.0-120	
Cadmium	10.0	10.0	100	80.0-120	
Chromium	10.0	10.3	103	80.0-120	
Lead	10.0	10.0	100	80.0-120	
Selenium	10.0	10.0	100	80.0-120	
Silver	2.00	2.06	103	80.0-120	

L1840614-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1840614-02 04/01/25 12:55 • (MS) R4193686-4 04/01/25 12:59 • (MSD) R4193686-5 04/01/25 13:00

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	10.4	10.1	104	101	1	75.0-125			2.31	20
Barium	10.0	ND	10.7	10.4	107	104	1	75.0-125			2.76	20
Cadmium	10.0	ND	10.1	9.86	101	98.6	1	75.0-125			2.07	20
Chromium	10.0	ND	10.6	10.3	106	103	1	75.0-125			2.19	20
Lead	10.0	ND	10.0	9.85	100	98.5	1	75.0-125			1.97	20
Selenium	10.0	ND	10.6	10.4	105	103	1	75.0-125			2.01	20
Silver	2.00	ND	2.08	2.03	104	102	1	75.0-125			2.26	20

L1841294-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841294-02 04/01/25 13:02 • (MS) R4193686-6 04/01/25 13:04 • (MSD) R4193686-7 04/01/25 13:06

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	9.99	10.0	99.9	100	1	75.0-125			0.463	20
Barium	10.0	0.153	10.7	10.7	105	105	1	75.0-125			0.0650	20
Cadmium	10.0	ND	9.98	9.92	99.8	99.2	1	75.0-125			0.597	20
Chromium	10.0	ND	10.4	10.4	104	104	1	75.0-125			0.425	20
Lead	10.0	ND	9.92	9.88	99.2	98.8	1	75.0-125			0.470	20
Selenium	10.0	ND	9.76	9.75	96.7	96.6	1	75.0-125			0.0677	20
Silver	2.00	ND	2.05	2.05	102	103	1	75.0-125			0.139	20

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R4195884-2 04/06/25 18:47

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	1.18	J	0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	*98.9*			*77.0-120*

Laboratory Control Sample (LCS)

(LCS) R4195884-1 04/06/25 17:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.00	4.75	95.0	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*109*	*77.0-120*	

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R4195721-3 04/05/25 23:14

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0167	0.0500
Carbon tetrachloride	U		0.0167	0.0500
Chlorobenzene	U		0.0167	0.0500
Chloroform	U		0.0833	0.250
1,2-Dichloroethane	U		0.0167	0.0500
1,1-Dichloroethene	U		0.0167	0.0500
2-Butanone (MEK)	U		0.167	0.500
Tetrachloroethene	U		0.0167	0.0500
Trichloroethene	U		0.0167	0.0500
Vinyl chloride	U		0.0167	0.0500
(S) Toluene-d8	*103*			*80.0-120*
(S) 4-Bromofluorobenzene	*97.3*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*101*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R4195721-1 04/05/25 21:52 • (LCSD) R4195721-2 04/05/25 22:12

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.250	0.250	0.263	100	105	70.0-123			5.07	20
Carbon tetrachloride	0.250	0.265	0.268	106	107	68.0-126			1.13	20
Chlorobenzene	0.250	0.252	0.261	101	104	80.0-121			3.51	20
Chloroform	0.250	0.256	0.265	102	106	73.0-120			3.45	20
1,2-Dichloroethane	0.250	0.255	0.264	102	106	70.0-128			3.47	20
1,1-Dichloroethene	0.250	0.266	0.264	106	106	71.0-124			0.755	20
2-Butanone (MEK)	1.25	0.965	0.749	77.2	59.9	44.0-160		J3	25.2	20
Tetrachloroethene	0.250	0.258	0.262	103	105	72.0-132			1.54	20
Trichloroethene	0.250	0.283	0.258	113	103	78.0-124			9.24	20
Vinyl chloride	0.250	0.240	0.248	96.0	99.2	67.0-131			3.28	20
(S) Toluene-d8				*99.2*	*99.2*	*80.0-120*				
(S) 4-Bromofluorobenzene				*101*	*99.3*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*99.2*	*98.5*	*70.0-130*				

L1841178-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1841178-01 04/06/25 00:56 • (MS) R4195721-4 04/06/25 07:03

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Benzene	0.250	ND	0.246	98.4	1	17.0-158	
Carbon tetrachloride	0.250	ND	0.267	107	1	23.0-159	
Chlorobenzene	0.250	ND	0.240	96.0	1	33.0-152	
Chloroform	0.250	ND	0.253	101	1	29.0-154	
1,2-Dichloroethane	0.250	ND	0.255	102	1	29.0-151	
1,1-Dichloroethene	0.250	ND	0.276	110	1	11.0-160	
2-Butanone (MEK)	1.25	ND	0.879	70.3	1	10.0-160	
Tetrachloroethene	0.250	ND	0.247	98.8	1	10.0-160	
Trichloroethene	0.250	ND	0.315	126	1	10.0-160	
Vinyl chloride	0.250	ND	0.263	105	1	10.0-160	
(S) Toluene-d8				*98.2*		*80.0-120*	
(S) 4-Bromofluorobenzene				*98.5*		*77.0-126*	
(S) 1,2-Dichloroethane-d4				*101*		*70.0-130*	

L1841335-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841335-02 04/06/25 03:39 • (MS) R4195721-6 04/06/25 07:23 • (MSD) R4195721-7 04/06/25 07:43

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.250	ND	0.252	0.255	101	102	1	17.0-158			1.18	27
Carbon tetrachloride	0.250	ND	0.268	0.277	107	111	1	23.0-159			3.30	28
Chlorobenzene	0.250	ND	0.239	0.240	95.6	96.0	1	33.0-152			0.418	27
Chloroform	0.250	ND	0.256	0.256	102	102	1	29.0-154			0.000	28
1,2-Dichloroethane	0.250	ND	0.261	0.256	104	102	1	29.0-151			1.93	27
1,1-Dichloroethene	0.250	ND	0.266	0.267	106	107	1	11.0-160			0.375	29
2-Butanone (MEK)	1.25	ND	0.728	0.756	58.2	60.5	1	10.0-160			3.77	32
Tetrachloroethene	0.250	ND	0.242	0.241	96.8	96.4	1	10.0-160			0.414	27
Trichloroethene	0.250	ND	0.251	0.248	100	99.2	1	10.0-160			1.20	25
Vinyl chloride	0.250	ND	0.261	0.259	104	104	1	10.0-160			0.769	27
(S) Toluene-d8					*98.6*	*99.9*		*80.0-120*				
(S) 4-Bromofluorobenzene					*97.8*	*99.1*		*77.0-126*				
(S) 1,2-Dichloroethane-d4					*102*	*99.7*		*70.0-130*				

Method Blank (MB)

(MB) R4194592-1 04/02/25 15:27

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	*65.6*			*18.0-148*

Method Blank (MB)

(MB) R4194592-5 04/02/25 16:05

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	*69.5*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R4194592-2 04/02/25 15:40

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	42.2	84.4	50.0-150	
(S) o-Terphenyl			*65.8*	*18.0-148*	

L1841095-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841095-05 04/02/25 18:14 • (MS) R4194592-3 04/02/25 18:27 • (MSD) R4194592-4 04/02/25 18:40

Analyte	Spike Amount (dry) mg/kg	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	59.0	ND	50.5	50.2	77.7	76.8	1	50.0-150			0.483	20
(S) o-Terphenyl					*52.5*	*51.4*		*18.0-148*				

Sample Narrative:

OS: Sample resembles laboratory standard for Motor Oil.

WG2481134

Polychlorinated Biphenyls (GC) by Method 8082 A

QUALITY CONTROL SUMMARY

L1841389-02

Method Blank (MB)

(MB) R4194922-1 04/03/25 00:41

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
PCB 1016	U		0.0102	0.0340
PCB 1221	U		0.0107	0.0340
PCB 1232	U		0.0182	0.0340
PCB 1242	U		0.0101	0.0340
PCB 1248	U		0.0124	0.0170
PCB 1254	U		0.0104	0.0170
PCB 1260	U		0.0110	0.0170
(S) Decachlorobiphenyl	*73.3*			*10.0-135*
(S) Tetrachloro-m-xylene	*63.1*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R4194922-2 04/03/25 00:50

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
PCB 1016	0.167	0.118	70.7	36.0-141	
PCB 1260	0.167	0.115	68.9	37.0-145	
(S) Decachlorobiphenyl			*79.1*	*10.0-135*	
(S) Tetrachloro-m-xylene			*70.6*	*10.0-139*	

L1841367-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841367-01 04/03/25 01:19 • (MS) R4194922-3 04/03/25 01:29 • (MSD) R4194922-4 04/03/25 01:39

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
PCB 1016	0.163	ND	0.0616	0.0963	37.8	58.7	1	10.0-160		J3	44.0	37
PCB 1260	0.163	ND	0.0620	0.0953	38.0	58.1	1	10.0-160		J3	42.3	38
(S) Decachlorobiphenyl					*46.2*	*70.1*		*10.0-135*				
(S) Tetrachloro-m-xylene					*40.0*	*57.5*		*10.0-139*				

Method Blank (MB)

(MB) R4196623-2 04/07/25 23:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
1,4-Dichlorobenzene	U		0.0333	0.100
2,4-Dinitrotoluene	U		0.0333	0.100
Hexachlorobenzene	U		0.0333	0.100
Hexachloro-1,3-butadiene	U		0.0333	0.100
Hexachloroethane	U		0.0333	0.100
Nitrobenzene	U		0.0333	0.100
Pyridine	U		0.0333	0.100
3&4-Methyl Phenol	U		0.0333	0.100
2-Methylphenol	U		0.0333	0.100
Pentachlorophenol	U		0.0333	0.100
2,4,5-Trichlorophenol	U		0.0333	0.100
2,4,6-Trichlorophenol	U		0.0333	0.100
(S) 2-Fluorophenol	*31.0*			*10.0-120*
(S) Phenol-d5	*21.3*			*10.0-120*
(S) Nitrobenzene-d5	*70.1*			*10.0-127*
(S) 2-Fluorobiphenyl	*55.5*			*10.0-130*
(S) 2,4,6-Tribromophenol	*52.5*			*10.0-155*
(S) p-Terphenyl-d14	*63.8*			*10.0-128*

Laboratory Control Sample (LCS)

(LCS) R4196623-1 04/07/25 23:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
1,4-Dichlorobenzene	0.500	0.289	57.8	18.0-120	
2,4-Dinitrotoluene	0.500	0.378	75.6	49.0-124	
Hexachlorobenzene	0.500	0.300	60.0	44.0-120	
Hexachloro-1,3-butadiene	0.500	0.307	61.4	19.0-120	
Hexachloroethane	0.500	0.318	63.6	15.0-120	
Nitrobenzene	0.500	0.344	68.8	27.0-120	
Pyridine	0.500	0.0729	14.6	10.0-120	
3&4-Methyl Phenol	0.500	0.266	53.2	31.0-120	
2-Methylphenol	0.500	0.251	50.2	28.0-120	
Pentachlorophenol	0.500	0.262	52.4	23.0-120	
2,4,5-Trichlorophenol	0.500	0.349	69.8	44.0-120	
2,4,6-Trichlorophenol	0.500	0.320	64.0	42.0-120	
(S) 2-Fluorophenol			*36.4*	*10.0-120*	
(S) Phenol-d5			*23.9*	*10.0-120*	
(S) Nitrobenzene-d5			*71.2*	*10.0-127*	

Laboratory Control Sample (LCS)

(LCS) R4196623-1 04/07/25 23:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 2-Fluorobiphenyl			*61.7*	*10.0-130*	
(S) 2,4,6-Tribromophenol			*59.0*	*10.0-155*	
(S) p-Terphenyl-d14			*59.6*	*10.0-128*	

L1837968-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1837968-01 04/08/25 05:32 • (MS) R4196623-3 04/08/25 05:53 • (MSD) R4196623-4 04/08/25 06:14

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,4-Dichlorobenzene	0.500	ND	0.284	0.254	56.8	50.8	1	17.0-120			11.2	40
2,4-Dinitrotoluene	0.500	ND	0.363	0.348	72.6	69.6	1	39.0-125			4.22	25
Hexachlorobenzene	0.500	ND	0.315	0.263	63.0	52.6	1	35.0-122			18.0	24
Hexachloro-1,3-butadiene	0.500	ND	0.319	0.276	63.8	55.2	1	12.0-120			14.5	34
Hexachloroethane	0.500	ND	0.315	0.275	63.0	55.0	1	10.0-120			13.6	40
Nitrobenzene	0.500	ND	0.351	0.318	70.2	63.6	1	12.0-120			9.87	30
Pyridine	0.500	ND	ND	ND	18.9	19.9	1	10.0-120			5.25	37
3&4-Methyl Phenol	0.500	ND	0.236	0.215	47.2	43.0	1	10.0-120			9.31	36
2-Methylphenol	0.500	ND	0.231	0.201	46.2	40.2	1	10.0-120			13.9	30
Pentachlorophenol	0.500	ND	0.243	0.214	48.6	42.8	1	10.0-128			12.7	37
2,4,5-Trichlorophenol	0.500	ND	0.345	0.306	69.0	61.2	1	33.0-120			12.0	31
2,4,6-Trichlorophenol	0.500	ND	0.335	0.293	67.0	58.6	1	26.0-120			13.4	31
(S) 2-Fluorophenol					*35.7*	*29.5*		*10.0-120*				
(S) Phenol-d5					*23.4*	*20.9*		*10.0-120*				
(S) Nitrobenzene-d5					*72.2*	*65.5*		*10.0-127*				
(S) 2-Fluorobiphenyl					*61.4*	*53.9*		*10.0-130*				
(S) 2,4,6-Tribromophenol					*62.0*	*56.0*		*10.0-155*				
(S) p-Terphenyl-d14					*56.2*	*50.9*		*10.0-128*				

GLOSSARY OF TERMS

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
C3	The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Method sensitivity check is acceptable.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
T8	Sample(s) received past/too close to holding time expiration.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1,6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1,4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Civil & Environmental Consultants - PA

700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:
Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to:
Laura Campbell 800-365-2324

Email To: lcampbell@cecinc.com

Project Description:
Benwood Shredder Fluff

City/State Collected: Benwood WV

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project # 335-863

Lab Project # CECPPA-BENWOOD

Collected by (print): Sarah Van Horn

Site/Facility ID # AMG

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day ___ STD TAT

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

SDG # 1841389
Table E002
Acctnum: CECPPA
Template: T270505
Prelogin: P1139373
PM: 3564 - Chad A Upchurch
PB: 3/20/25 BK
Shipped Via: FedEX Ground

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres	Remarks	Sample # (lab only)
SF-1	Comp	SS		3-25-25	1600	2			X		-01
SF-1	Comp	SS		3-25-25	1600	2	X	X			-02

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking # 443924451442

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature)	Date: 3-27-25	Time: 2000	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: [✓ Yes] / No
[✓ HCL] / MeoH
TBR

Temp: TA9 2.0+0.4=2.4 °C Bottles Received: 4

Date: 3/28/25 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / [✓ OK]

ANALYTICAL REPORT

May 14, 2025

Revised Report

Civil & Environmental Consultants - PA

Sample Delivery Group:	L1841390
Samples Received:	03/28/2025
Project Number:	335-863
Description:	Benwood Shredder Fluff
Site:	AMG RESOURCES BENWOOD
Report To:	Laura Campbell 700 Cherrington Parkway Moon Township, PA 15108

Entire Report Reviewed By:

Chad A Upchurch
Project Manager

Pace Analytical National

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

TABLE OF CONTENTS

SAMPLE SUMMARY

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3 Ss
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5 Sr
6 Qc
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SF-2 L1841390-01

Collected by	Collected date/time	Received date/time
H. Enderby	03/26/25 16:00	03/28/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG2479618	1	04/01/25 12:57	04/01/25 12:57	CCY	Mt. Juliet, TN
Preparation by Method 1311	WG2479808	1	03/31/25 12:32	03/31/25 12:32	BTP	Mt. Juliet, TN
Mercury by Method 7470A	WG2481731	1	04/02/25 11:32	04/04/25 14:30	LAS	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2481836	1	04/02/25 17:18	04/03/25 01:06	BAG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2481237	1	04/06/25 06:02	04/06/25 06:02	JHH	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG2482106	1	04/04/25 19:00	04/08/25 07:18	JCH	Mt. Juliet, TN

SF-2 L1841390-02

Collected by	Collected date/time	Received date/time
H. Enderby	03/26/25 16:00	03/28/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2509891	1	05/08/25 09:21	05/08/25 09:30	CMB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2483901	500	04/01/25 16:29	04/06/25 20:45	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG2481835	2010	04/04/25 07:01	04/05/25 03:47	KKS	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2481134	1.99	04/02/25 06:23	04/03/25 03:54	MEW	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2481134	9.95	04/02/25 06:23	04/03/25 20:29	MEW	Mt. Juliet, TN

CASE NARRATIVE

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chad A Upchurch
Project Manager

Report Revision History

Level II Report - Version 1: 04/08/25 22:39

Project Narrative

L1841390-02: Reported on a dry weight corrected basis, per request.

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
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Preparation by Method 1311

	Result	Qualifier	Prep	Batch
Analyte			date / time	
TCLP Extraction	-		4/1/2025 12:57:14 PM	WG2479618
TCLP ZHE Extraction	-		3/31/2025 12:32:14 PM	WG2479808
Initial pH	9.37		4/1/2025 12:57:14 PM	WG2479618
Final pH	6.06		4/1/2025 12:57:14 PM	WG2479618

Mercury by Method 7470A

	Result	Qualifier	RDL	Limit	Dilution	Analysis	Batch
Analyte	mg/l		mg/l	mg/l		date / time	
Mercury	ND		0.0100	0.20	1	04/04/2025 14:30	WG2481731

Metals (ICP) by Method 6010D

	Result	Qualifier	RDL	Limit	Dilution	Analysis	Batch
Analyte	mg/l		mg/l	mg/l		date / time	
Arsenic	ND		0.100	5	1	04/03/2025 01:06	WG2481836
Barium	0.742		0.100	100	1	04/03/2025 01:06	WG2481836
Cadmium	0.182		0.100	1	1	04/03/2025 01:06	WG2481836
Chromium	ND		0.100	5	1	04/03/2025 01:06	WG2481836
Lead	0.733		0.100	5	1	04/03/2025 01:06	WG2481836
Selenium	ND		0.100	1	1	04/03/2025 01:06	WG2481836
Silver	ND		0.100	5	1	04/03/2025 01:06	WG2481836

Volatile Organic Compounds (GC/MS) by Method 8260B

	Result	Qualifier	RDL	Limit	Dilution	Analysis	Batch
Analyte	mg/l		mg/l	mg/l		date / time	
Benzene	ND		0.0500	0.50	1	04/06/2025 06:02	WG2481237
Carbon tetrachloride	ND		0.0500	0.50	1	04/06/2025 06:02	WG2481237
Chlorobenzene	ND		0.0500	100	1	04/06/2025 06:02	WG2481237
Chloroform	ND		0.250	6	1	04/06/2025 06:02	WG2481237
1,2-Dichloroethane	ND		0.0500	0.50	1	04/06/2025 06:02	WG2481237
1,1-Dichloroethene	ND		0.0500	0.70	1	04/06/2025 06:02	WG2481237
2-Butanone (MEK)	ND	C3 J3	0.500	200	1	04/06/2025 06:02	WG2481237
Tetrachloroethene	ND		0.0500	0.70	1	04/06/2025 06:02	WG2481237
Trichloroethene	ND		0.0500	0.50	1	04/06/2025 06:02	WG2481237
Vinyl chloride	ND		0.0500	0.20	1	04/06/2025 06:02	WG2481237
(S) Toluene-d8	*99.9*		*80.0-120*			*04/06/2025 06:02*	WG2481237
(S) 4-Bromofluorobenzene	*94.1*		*77.0-126*			*04/06/2025 06:02*	WG2481237
(S) 1,2-Dichloroethane-d4	*104*		*70.0-130*			*04/06/2025 06:02*	WG2481237

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

	Result	Qualifier	RDL	Limit	Dilution	Analysis	Batch
Analyte	mg/l		mg/l	mg/l		date / time	
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/08/2025 07:18	WG2482106
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/08/2025 07:18	WG2482106
Hexachlorobenzene	ND		0.100	0.13	1	04/08/2025 07:18	WG2482106
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/08/2025 07:18	WG2482106
Hexachloroethane	ND		0.100	3	1	04/08/2025 07:18	WG2482106
Nitrobenzene	ND		0.100	2	1	04/08/2025 07:18	WG2482106
Pyridine	ND		0.100	5	1	04/08/2025 07:18	WG2482106
3&4-Methyl Phenol	ND		0.100	400	1	04/08/2025 07:18	WG2482106
2-Methylphenol	ND		0.100	200	1	04/08/2025 07:18	WG2482106
Pentachlorophenol	ND		0.100	100	1	04/08/2025 07:18	WG2482106
2,4,5-Trichlorophenol	ND		0.100	400	1	04/08/2025 07:18	WG2482106
2,4,6-Trichlorophenol	ND		0.100	2	1	04/08/2025 07:18	WG2482106
(S) 2-Fluorophenol	*36.2*		*10.0-120*			*04/08/2025 07:18*	WG2482106

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
(S) Phenol-d5	*24.7*		*10.0-120*			*04/08/2025 07:18*	WG2482106
(S) Nitrobenzene-d5	*83.5*		*10.0-127*			*04/08/2025 07:18*	WG2482106
(S) 2-Fluorobiphenyl	*62.4*		*10.0-130*			*04/08/2025 07:18*	WG2482106
(S) 2,4,6-Tribromophenol	*54.0*		*10.0-155*			*04/08/2025 07:18*	WG2482106
(S) p-Terphenyl-d14	*57.2*		*10.0-128*			*04/08/2025 07:18*	WG2482106

SAMPLE RESULTS - 02

L1841390

Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	%			date / time	
Total Solids	71.8	T8	1	05/08/2025 09:30	WG2509891

Volatile Organic Compounds (GC) by Method 8015D/GRO

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
TPH (GC/FID) Low Fraction	411		73.6	500	04/06/2025 20:45	WG2483901
(S) a,a,a-Trifluorotoluene(FID)	*101*		*77.0-120*		*04/06/2025 20:45*	WG2483901

Semi-Volatile Organic Compounds (GC) by Method 8015

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	14100		11200	2010	04/05/2025 03:47	WG2481835
C28-C40 Oil Range	ND		11200	2010	04/05/2025 03:47	WG2481835
(S) o-Terphenyl	*0.000*	J7	*18.0-148*		*04/05/2025 03:47*	WG2481835

Polychlorinated Biphenyls (GC) by Method 8082 A

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
PCB 1016	ND		0.0943	1.99	04/03/2025 03:54	WG2481134
PCB 1221	ND		0.0943	1.99	04/03/2025 03:54	WG2481134
PCB 1232	ND		0.0943	1.99	04/03/2025 03:54	WG2481134
PCB 1242	11.3		0.471	9.95	04/03/2025 20:29	WG2481134
PCB 1248	ND		0.0471	1.99	04/03/2025 03:54	WG2481134
PCB 1254	2.87		0.235	9.95	04/03/2025 20:29	WG2481134
PCB 1260	ND		0.0471	1.99	04/03/2025 03:54	WG2481134
(S) Decachlorobiphenyl	*91.7*		*10.0-135*		*04/03/2025 20:29*	WG2481134
(S) Decachlorobiphenyl	*89.5*		*10.0-135*		*04/03/2025 03:54*	WG2481134
(S) Tetrachloro-m-xylene	*82.7*		*10.0-139*		*04/03/2025 03:54*	WG2481134
(S) Tetrachloro-m-xylene	*75.9*		*10.0-139*		*04/03/2025 20:29*	WG2481134

Sample Narrative:

L1841390-02 WG2481134: Dilution due to matrix impact during extraction procedure

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R4212182-1 05/08/25 09:30

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00200			

L1854025-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1854025-07 05/08/25 09:30 • (DUP) R4212182-3 05/08/25 09:30

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	77.2	76.4	1	0.973		10

Laboratory Control Sample (LCS)

(LCS) R4212182-2 05/08/25 09:30

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	90.0-110	

Method Blank (MB)

(MB) R4195339-1 04/04/25 13:45

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.00333	0.0100

Laboratory Control Sample (LCS)

(LCS) R4195339-8 04/04/25 15:47

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.0300	0.0331	110	80.0-120	

L1841339-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841339-02 04/04/25 13:50 • (MS) R4195339-4 04/04/25 13:55 • (MSD) R4195339-5 04/04/25 13:57

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0363	0.0367	121	122	1	75.0-125			1.30	20

L1841339-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841339-05 04/04/25 14:00 • (MS) R4195339-6 04/04/25 14:02 • (MSD) R4195339-7 04/04/25 14:05

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0361	0.0361	120	120	1	75.0-125			0.0479	20

Method Blank (MB)

(MB) R4194598-1 04/03/25 00:31

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.0333	0.100
Barium	U		0.0333	0.100
Cadmium	U		0.0333	0.100
Chromium	U		0.0333	0.100
Lead	U		0.0333	0.100
Selenium	U		0.0333	0.100
Silver	U		0.0333	0.100

Laboratory Control Sample (LCS)

(LCS) R4194598-2 04/03/25 00:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	10.0	10.0	100	80.0-120	
Barium	10.0	10.0	100	80.0-120	
Cadmium	10.0	9.70	97.0	80.0-120	
Chromium	10.0	9.98	99.8	80.0-120	
Lead	10.0	9.97	99.7	80.0-120	
Selenium	10.0	9.91	99.1	80.0-120	
Silver	2.00	2.04	102	80.0-120	

L1841339-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841339-02 04/03/25 00:35 • (MS) R4194598-4 04/03/25 00:38 • (MSD) R4194598-5 04/03/25 00:40

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	9.76	9.87	97.6	98.7	1	75.0-125			1.10	20
Barium	10.0	ND	9.89	10.0	97.9	99.1	1	75.0-125			1.23	20
Cadmium	10.0	ND	9.43	9.55	94.3	95.5	1	75.0-125			1.29	20
Chromium	10.0	ND	9.76	9.91	96.8	98.3	1	75.0-125			1.57	20
Lead	10.0	ND	9.63	9.87	96.3	98.7	1	75.0-125			2.47	20
Selenium	10.0	ND	9.49	9.90	94.9	99.0	1	75.0-125			4.25	20
Silver	2.00	ND	1.96	2.01	97.9	101	1	75.0-125			2.68	20

L1841339-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841339-05 04/03/25 00:42 • (MS) R4194598-6 04/03/25 00:44 • (MSD) R4194598-7 04/03/25 00:46

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	9.68	9.74	96.2	96.8	1	75.0-125			0.604	20
Barium	10.0	ND	9.89	9.97	98.9	99.7	1	75.0-125			0.735	20
Cadmium	10.0	ND	9.51	9.57	95.1	95.7	1	75.0-125			0.663	20
Chromium	10.0	0.817	10.6	10.8	98.3	99.4	1	75.0-125			1.08	20
Lead	10.0	ND	9.73	9.81	96.8	97.6	1	75.0-125			0.820	20
Selenium	10.0	ND	9.41	9.60	93.5	95.4	1	75.0-125			2.00	20
Silver	2.00	ND	2.00	1.99	99.9	99.6	1	75.0-125			0.235	20

Method Blank (MB)

(MB) R4195884-2 04/06/25 18:47

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	1.18	J	0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	*98.9*			*77.0-120*

Laboratory Control Sample (LCS)

(LCS) R4195884-1 04/06/25 17:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.00	4.75	95.0	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*109*	*77.0-120*	

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R4195721-3 04/05/25 23:14

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0167	0.0500
Carbon tetrachloride	U		0.0167	0.0500
Chlorobenzene	U		0.0167	0.0500
Chloroform	U		0.0833	0.250
1,2-Dichloroethane	U		0.0167	0.0500
1,1-Dichloroethene	U		0.0167	0.0500
2-Butanone (MEK)	U		0.167	0.500
Tetrachloroethene	U		0.0167	0.0500
Trichloroethene	U		0.0167	0.0500
Vinyl chloride	U		0.0167	0.0500
(S) Toluene-d8	*103*			*80.0-120*
(S) 4-Bromofluorobenzene	*97.3*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*101*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R4195721-1 04/05/25 21:52 • (LCSD) R4195721-2 04/05/25 22:12

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.250	0.250	0.263	100	105	70.0-123			5.07	20
Carbon tetrachloride	0.250	0.265	0.268	106	107	68.0-126			1.13	20
Chlorobenzene	0.250	0.252	0.261	101	104	80.0-121			3.51	20
Chloroform	0.250	0.256	0.265	102	106	73.0-120			3.45	20
1,2-Dichloroethane	0.250	0.255	0.264	102	106	70.0-128			3.47	20
1,1-Dichloroethene	0.250	0.266	0.264	106	106	71.0-124			0.755	20
2-Butanone (MEK)	1.25	0.965	0.749	77.2	59.9	44.0-160		J3	25.2	20
Tetrachloroethene	0.250	0.258	0.262	103	105	72.0-132			1.54	20
Trichloroethene	0.250	0.283	0.258	113	103	78.0-124			9.24	20
Vinyl chloride	0.250	0.240	0.248	96.0	99.2	67.0-131			3.28	20
(S) Toluene-d8				*99.2*	*99.2*	*80.0-120*				
(S) 4-Bromofluorobenzene				*101*	*99.3*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*99.2*	*98.5*	*70.0-130*				

L1841178-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1841178-01 04/06/25 00:56 • (MS) R4195721-4 04/06/25 07:03

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Benzene	0.250	ND	0.246	98.4	1	17.0-158	
Carbon tetrachloride	0.250	ND	0.267	107	1	23.0-159	
Chlorobenzene	0.250	ND	0.240	96.0	1	33.0-152	
Chloroform	0.250	ND	0.253	101	1	29.0-154	
1,2-Dichloroethane	0.250	ND	0.255	102	1	29.0-151	
1,1-Dichloroethene	0.250	ND	0.276	110	1	11.0-160	
2-Butanone (MEK)	1.25	ND	0.879	70.3	1	10.0-160	
Tetrachloroethene	0.250	ND	0.247	98.8	1	10.0-160	
Trichloroethene	0.250	ND	0.315	126	1	10.0-160	
Vinyl chloride	0.250	ND	0.263	105	1	10.0-160	
(S) Toluene-d8				*98.2*		*80.0-120*	
(S) 4-Bromofluorobenzene				*98.5*		*77.0-126*	
(S) 1,2-Dichloroethane-d4				*101*		*70.0-130*	

L1841335-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841335-02 04/06/25 03:39 • (MS) R4195721-6 04/06/25 07:23 • (MSD) R4195721-7 04/06/25 07:43

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.250	ND	0.252	0.255	101	102	1	17.0-158			1.18	27
Carbon tetrachloride	0.250	ND	0.268	0.277	107	111	1	23.0-159			3.30	28
Chlorobenzene	0.250	ND	0.239	0.240	95.6	96.0	1	33.0-152			0.418	27
Chloroform	0.250	ND	0.256	0.256	102	102	1	29.0-154			0.000	28
1,2-Dichloroethane	0.250	ND	0.261	0.256	104	102	1	29.0-151			1.93	27
1,1-Dichloroethene	0.250	ND	0.266	0.267	106	107	1	11.0-160			0.375	29
2-Butanone (MEK)	1.25	ND	0.728	0.756	58.2	60.5	1	10.0-160			3.77	32
Tetrachloroethene	0.250	ND	0.242	0.241	96.8	96.4	1	10.0-160			0.414	27
Trichloroethene	0.250	ND	0.251	0.248	100	99.2	1	10.0-160			1.20	25
Vinyl chloride	0.250	ND	0.261	0.259	104	104	1	10.0-160			0.769	27
(S) Toluene-d8					*98.6*	*99.9*		*80.0-120*				
(S) 4-Bromofluorobenzene					*97.8*	*99.1*		*77.0-126*				
(S) 1,2-Dichloroethane-d4					*102*	*99.7*		*70.0-130*				

Method Blank (MB)

(MB) R4195496-1 04/04/25 21:29

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	*74.5*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R4195496-2 04/04/25 21:43

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	39.3	78.6	50.0-150	
(S) o-Terphenyl			*95.0*	*18.0-148*	

L1841402-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841402-01 04/05/25 00:30 • (MS) R4195496-3 04/05/25 00:43 • (MSD) R4195496-4 04/05/25 00:57

Analyte	Spike Amount (dry) mg/kg	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	54.7	ND	41.0	42.7	75.1	77.5	1	50.0-150			4.04	20
(S) o-Terphenyl					*88.7*	*88.7*		*18.0-148*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4194922-1 04/03/25 00:41

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.0102	0.0340
PCB 1221	U		0.0107	0.0340
PCB 1232	U		0.0182	0.0340
PCB 1242	U		0.0101	0.0340
PCB 1248	U		0.0124	0.0170
PCB 1254	U		0.0104	0.0170
PCB 1260	U		0.0110	0.0170
(S) Decachlorobiphenyl	*73.3*			*10.0-135*
(S) Tetrachloro-m-xylene	*63.1*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R4194922-2 04/03/25 00:50

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1016	0.167	0.118	70.7	36.0-141	
PCB 1260	0.167	0.115	68.9	37.0-145	
(S) Decachlorobiphenyl			*79.1*	*10.0-135*	
(S) Tetrachloro-m-xylene			*70.6*	*10.0-139*	

L1841367-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841367-01 04/03/25 01:19 • (MS) R4194922-3 04/03/25 01:29 • (MSD) R4194922-4 04/03/25 01:39

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1016	0.163	ND	0.0616	0.0963	37.8	58.7	1	10.0-160		J3	44.0	37
PCB 1260	0.163	ND	0.0620	0.0953	38.0	58.1	1	10.0-160		J3	42.3	38
(S) Decachlorobiphenyl					*46.2*	*70.1*		*10.0-135*				
(S) Tetrachloro-m-xylene					*40.0*	*57.5*		*10.0-139*				

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R4196623-2 04/07/25 23:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
1,4-Dichlorobenzene	U		0.0333	0.100
2,4-Dinitrotoluene	U		0.0333	0.100
Hexachlorobenzene	U		0.0333	0.100
Hexachloro-1,3-butadiene	U		0.0333	0.100
Hexachloroethane	U		0.0333	0.100
Nitrobenzene	U		0.0333	0.100
Pyridine	U		0.0333	0.100
3&4-Methyl Phenol	U		0.0333	0.100
2-Methylphenol	U		0.0333	0.100
Pentachlorophenol	U		0.0333	0.100
2,4,5-Trichlorophenol	U		0.0333	0.100
2,4,6-Trichlorophenol	U		0.0333	0.100
(S) 2-Fluorophenol	*31.0*			*10.0-120*
(S) Phenol-d5	*21.3*			*10.0-120*
(S) Nitrobenzene-d5	*70.1*			*10.0-127*
(S) 2-Fluorobiphenyl	*55.5*			*10.0-130*
(S) 2,4,6-Tribromophenol	*52.5*			*10.0-155*
(S) p-Terphenyl-d14	*63.8*			*10.0-128*

Laboratory Control Sample (LCS)

(LCS) R4196623-1 04/07/25 23:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
1,4-Dichlorobenzene	0.500	0.289	57.8	18.0-120	
2,4-Dinitrotoluene	0.500	0.378	75.6	49.0-124	
Hexachlorobenzene	0.500	0.300	60.0	44.0-120	
Hexachloro-1,3-butadiene	0.500	0.307	61.4	19.0-120	
Hexachloroethane	0.500	0.318	63.6	15.0-120	
Nitrobenzene	0.500	0.344	68.8	27.0-120	
Pyridine	0.500	0.0729	14.6	10.0-120	
3&4-Methyl Phenol	0.500	0.266	53.2	31.0-120	
2-Methylphenol	0.500	0.251	50.2	28.0-120	
Pentachlorophenol	0.500	0.262	52.4	23.0-120	
2,4,5-Trichlorophenol	0.500	0.349	69.8	44.0-120	
2,4,6-Trichlorophenol	0.500	0.320	64.0	42.0-120	
(S) 2-Fluorophenol			*36.4*	*10.0-120*	
(S) Phenol-d5			*23.9*	*10.0-120*	
(S) Nitrobenzene-d5			*71.2*	*10.0-127*	

Laboratory Control Sample (LCS)

(LCS) R4196623-1 04/07/25 23:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 2-Fluorobiphenyl			*61.7*	*10.0-130*	
(S) 2,4,6-Tribromophenol			*59.0*	*10.0-155*	
(S) p-Terphenyl-d14			*59.6*	*10.0-128*	

L1837968-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1837968-01 04/08/25 05:32 • (MS) R4196623-3 04/08/25 05:53 • (MSD) R4196623-4 04/08/25 06:14

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,4-Dichlorobenzene	0.500	ND	0.284	0.254	56.8	50.8	1	17.0-120			11.2	40
2,4-Dinitrotoluene	0.500	ND	0.363	0.348	72.6	69.6	1	39.0-125			4.22	25
Hexachlorobenzene	0.500	ND	0.315	0.263	63.0	52.6	1	35.0-122			18.0	24
Hexachloro-1,3-butadiene	0.500	ND	0.319	0.276	63.8	55.2	1	12.0-120			14.5	34
Hexachloroethane	0.500	ND	0.315	0.275	63.0	55.0	1	10.0-120			13.6	40
Nitrobenzene	0.500	ND	0.351	0.318	70.2	63.6	1	12.0-120			9.87	30
Pyridine	0.500	ND	ND	ND	18.9	19.9	1	10.0-120			5.25	37
3&4-Methyl Phenol	0.500	ND	0.236	0.215	47.2	43.0	1	10.0-120			9.31	36
2-Methylphenol	0.500	ND	0.231	0.201	46.2	40.2	1	10.0-120			13.9	30
Pentachlorophenol	0.500	ND	0.243	0.214	48.6	42.8	1	10.0-128			12.7	37
2,4,5-Trichlorophenol	0.500	ND	0.345	0.306	69.0	61.2	1	33.0-120			12.0	31
2,4,6-Trichlorophenol	0.500	ND	0.335	0.293	67.0	58.6	1	26.0-120			13.4	31
(S) 2-Fluorophenol					*35.7*	*29.5*		*10.0-120*				
(S) Phenol-d5					*23.4*	*20.9*		*10.0-120*				
(S) Nitrobenzene-d5					*72.2*	*65.5*		*10.0-127*				
(S) 2-Fluorobiphenyl					*61.4*	*53.9*		*10.0-130*				
(S) 2,4,6-Tribromophenol					*62.0*	*56.0*		*10.0-155*				
(S) p-Terphenyl-d14					*56.2*	*50.9*		*10.0-128*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
C3	The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Method sensitivity check is acceptable.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
T8	Sample(s) received past/too close to holding time expiration.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660
Alaska	17-026
Arizona	AZ0612
Arkansas	88-0469
California	2932
Colorado	TN00003
Connecticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia [1]	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
Iowa	364
Kansas	E-10277
Kentucky [1,6]	KY90010
Kentucky [2]	16
Louisiana	AI30792
Louisiana	LA018
Maine	TN00003
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086
Nebraska	NE-OS-15-05
Nevada	TN000032021-1
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico [1]	TN00003
New York	11742
North Carolina	Env375
North Carolina [1]	DW21704
North Carolina [3]	41
North Dakota	R-140
Ohio–VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004002
South Dakota	n/a
Tennessee [1,4]	2006
Texas	T104704245-20-18
Texas [5]	LAB0152
Utah	TN000032021-11
Vermont	VT2006
Virginia	110033
Washington	C847
West Virginia	233
Wisconsin	998093910
Wyoming	A2LA

A2LA – ISO 17025	1461.01
A2LA – ISO 17025 [5]	1461.02
Canada	1461.01
EPA–Crypto	TN00003
AIHA-LAP,LLC EMLAP	100789
DOD	1461.01
USDA	P330-15-00234

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Civil & Environmental Consultants - PA

700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:
Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # 1841390

E003

Ta

Acctnum: **CECPPA**
Template: **T270505**
Prelogin: **P1139362**
PM: **3564 - Chad A Upchurch**
PB: lu 3/19/25
Shipped Via: **FedEX Ground**

Report to:
Laura Campbell 800-365-2324

Email To: **lcampbell@cecinc.com**

Project Description:
Benwood Shredder Fluff

City/State Collected: Benwood, WV

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
335-863

Lab Project #
CECPPA-BENWOOD

Collected by (print): H. Enderby

Site/Facility ID # AMG Resources Benwood

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day X STD TAT

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres	Remarks	Sample # (lab only)
SF-2	Comp	SS		3/26/25	1600	2			X		-01
SF-2	Comp	SS		↑	1600	2	X	X			-02

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_________

Remarks:

pH _______ Temp _______
Flow _______ Other _______

Samples returned via:
__ UPS __ FedEx __ Courier ___________

Tracking # 4439 2445 1442

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature) Hannah Enderby
Date: 3/26/2025
Time: 1745
Received by: (Signature)

Trip Blank Received: [✓ Yes] / No
[✓ HCL] / MeoH
TBR

Relinquished by : (Signature)
Date: 3-27-25
Time: 2000
Received by: (Signature)

Temp: TA92 2.0+0.4=2.4 °C
Bottles Received: 4

If preservation required by Login: Date/Time

Relinquished by : (Signature)
Date:
Time:
Received for lab by: (Signature)

Date: 3/28/25
Time: 0900

Hold:

Condition: NCF / [✓ OK]

ANALYTICAL REPORT

May 14, 2025

Revised Report

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Civil & Environmental Consultants - PA

Sample Delivery Group:	L1841391
Samples Received:	03/28/2025
Project Number:	335-863
Description:	Benwood Shredder Fluff
Site:	AMG
Report To:	Laura Campbell 700 Cherrington Parkway Moon Township, PA 15108

Entire Report Reviewed By:

Chad A Upchurch
Project Manager

Pace Analytical National

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

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SAMPLE SUMMARY

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5 Sr
6 Qc
7 Gl
8 Al
9 Sc

SF-3 L1841391-01

Collected by	Collected date/time	Received date/time
Sarah Van Horn	03/27/25 16:30	03/28/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG2479618	1	04/01/25 12:57	04/01/25 12:57	CCY	Mt. Juliet, TN
Preparation by Method 1311	WG2479808	1	03/31/25 12:32	03/31/25 12:32	BTP	Mt. Juliet, TN
Mercury by Method 7470A	WG2481731	1	04/02/25 11:32	04/04/25 14:33	LAS	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2481836	1	04/02/25 17:18	04/03/25 01:08	BAG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2481237	1	04/06/25 06:22	04/06/25 06:22	JHH	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG2482106	1	04/04/25 19:00	04/08/25 07:39	JCH	Mt. Juliet, TN

SF-3 L1841391-02

Collected by	Collected date/time	Received date/time
Sarah Van Horn	03/27/25 16:30	03/28/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2509891	1	05/08/25 09:21	05/08/25 09:30	CMB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2483901	500	04/01/25 16:29	04/06/25 21:08	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG2481835	2730	04/04/25 07:01	04/05/25 03:34	KKS	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2481134	14.7	04/02/25 06:23	04/03/25 03:35	LTB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2481134	14.7	04/02/25 06:23	04/03/25 20:20	MEW	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chad A Upchurch
Project Manager

Report Revision History

Level II Report - Version 1: 04/08/25 22:40

Project Narrative

L1841391-02: Reported on a dry weight corrected basis, per request.

1 Cp
2 Tc
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Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/1/2025 12:57:14 PM	WG2479618
TCLP ZHE Extraction	-		3/31/2025 12:32:14 PM	WG2479808
Initial pH	8.73		4/1/2025 12:57:14 PM	WG2479618
Final pH	5.92		4/1/2025 12:57:14 PM	WG2479618

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/04/2025 14:33	WG2481731

Metals (ICP) by Method 6010D

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	04/03/2025 01:08	WG2481836
Barium	0.504		0.100	100	1	04/03/2025 01:08	WG2481836
Cadmium	0.151		0.100	1	1	04/03/2025 01:08	WG2481836
Chromium	ND		0.100	5	1	04/03/2025 01:08	WG2481836
Lead	1.33		0.100	5	1	04/03/2025 01:08	WG2481836
Selenium	ND		0.100	1	1	04/03/2025 01:08	WG2481836
Silver	ND		0.100	5	1	04/03/2025 01:08	WG2481836

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/06/2025 06:22	WG2481237
Carbon tetrachloride	ND		0.0500	0.50	1	04/06/2025 06:22	WG2481237
Chlorobenzene	ND		0.0500	100	1	04/06/2025 06:22	WG2481237
Chloroform	ND		0.250	6	1	04/06/2025 06:22	WG2481237
1,2-Dichloroethane	ND		0.0500	0.50	1	04/06/2025 06:22	WG2481237
1,1-Dichloroethene	ND		0.0500	0.70	1	04/06/2025 06:22	WG2481237
2-Butanone (MEK)	ND	C3 J3	0.500	200	1	04/06/2025 06:22	WG2481237
Tetrachloroethene	ND		0.0500	0.70	1	04/06/2025 06:22	WG2481237
Trichloroethene	ND		0.0500	0.50	1	04/06/2025 06:22	WG2481237
Vinyl chloride	ND		0.0500	0.20	1	04/06/2025 06:22	WG2481237
(S) Toluene-d8	*98.5*		*80.0-120*			*04/06/2025 06:22*	WG2481237
(S) 4-Bromofluorobenzene	*94.0*		*77.0-126*			*04/06/2025 06:22*	WG2481237
(S) 1,2-Dichloroethane-d4	*103*		*70.0-130*			*04/06/2025 06:22*	WG2481237

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/08/2025 07:39	WG2482106
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/08/2025 07:39	WG2482106
Hexachlorobenzene	ND		0.100	0.13	1	04/08/2025 07:39	WG2482106
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/08/2025 07:39	WG2482106
Hexachloroethane	ND		0.100	3	1	04/08/2025 07:39	WG2482106
Nitrobenzene	ND		0.100	2	1	04/08/2025 07:39	WG2482106
Pyridine	ND		0.100	5	1	04/08/2025 07:39	WG2482106
3&4-Methyl Phenol	ND		0.100	400	1	04/08/2025 07:39	WG2482106
2-Methylphenol	ND		0.100	200	1	04/08/2025 07:39	WG2482106
Pentachlorophenol	ND		0.100	100	1	04/08/2025 07:39	WG2482106
2,4,5-Trichlorophenol	ND		0.100	400	1	04/08/2025 07:39	WG2482106
2,4,6-Trichlorophenol	ND		0.100	2	1	04/08/2025 07:39	WG2482106
(S) 2-Fluorophenol	*34.8*		*10.0-120*			*04/08/2025 07:39*	WG2482106

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
(S) Phenol-d5	*23.0*		*10.0-120*			*04/08/2025 07:39*	WG2482106
(S) Nitrobenzene-d5	*83.3*		*10.0-127*			*04/08/2025 07:39*	WG2482106
(S) 2-Fluorobiphenyl	*62.2*		*10.0-130*			*04/08/2025 07:39*	WG2482106
(S) 2,4,6-Tribromophenol	*40.1*		*10.0-155*			*04/08/2025 07:39*	WG2482106
(S) p-Terphenyl-d14	*58.7*		*10.0-128*			*04/08/2025 07:39*	WG2482106

SF-3
Collected date/time: 03/27/25 16:30

SAMPLE RESULTS - 02
L1841391

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	76.2	T8	1	05/08/2025 09:30	WG2509891

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	377		68.8	500	04/06/2025 21:08	WG2483901
(S) a,a,a-Trifluorotoluene(FID)	*99.7*		*77.0-120*		*04/06/2025 21:08*	WG2483901

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	74600		14300	2730	04/05/2025 03:34	WG2481835
C28-C40 Oil Range	69500		14300	2730	04/05/2025 03:34	WG2481835
(S) o-Terphenyl	*0.000*	J7	*18.0-148*		*04/05/2025 03:34*	WG2481835

Polychlorinated Biphenyls (GC) by Method 8082 A

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.656	14.7	04/03/2025 03:35	WG2481134
PCB 1221	ND		0.656	14.7	04/03/2025 03:35	WG2481134
PCB 1232	ND		0.656	14.7	04/03/2025 03:35	WG2481134
PCB 1242	8.85		0.656	14.7	04/03/2025 20:20	WG2481134
PCB 1248	ND		0.328	14.7	04/03/2025 03:35	WG2481134
PCB 1254	1.69		0.328	14.7	04/03/2025 20:20	WG2481134
PCB 1260	ND		0.328	14.7	04/03/2025 03:35	WG2481134
(S) Decachlorobiphenyl	*108*		*10.0-135*		*04/03/2025 20:20*	WG2481134
(S) Decachlorobiphenyl	*117*		*10.0-135*		*04/03/2025 03:35*	WG2481134
(S) Tetrachloro-m-xylene	*110*		*10.0-139*		*04/03/2025 20:20*	WG2481134
(S) Tetrachloro-m-xylene	*96.6*		*10.0-139*		*04/03/2025 03:35*	WG2481134

Sample Narrative:

L1841391-02 WG2481134: Dilution due to matrix impact during extraction procedure

Method Blank (MB)

(MB) R4212182-1 05/08/25 09:30

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00200			

L1854025-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1854025-07 05/08/25 09:30 • (DUP) R4212182-3 05/08/25 09:30

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	77.2	76.4	1	0.973		10

Laboratory Control Sample (LCS)

(LCS) R4212182-2 05/08/25 09:30

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	90.0-110	

Method Blank (MB)

(MB) R4195339-1 04/04/25 13:45

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.00333	0.0100

Laboratory Control Sample (LCS)

(LCS) R4195339-8 04/04/25 15:47

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.0300	0.0331	110	80.0-120	

L1841339-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841339-02 04/04/25 13:50 • (MS) R4195339-4 04/04/25 13:55 • (MSD) R4195339-5 04/04/25 13:57

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0363	0.0367	121	122	1	75.0-125			1.30	20

L1841339-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841339-05 04/04/25 14:00 • (MS) R4195339-6 04/04/25 14:02 • (MSD) R4195339-7 04/04/25 14:05

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0361	0.0361	120	120	1	75.0-125			0.0479	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4194598-1 04/03/25 00:31

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.0333	0.100
Barium	U		0.0333	0.100
Cadmium	U		0.0333	0.100
Chromium	U		0.0333	0.100
Lead	U		0.0333	0.100
Selenium	U		0.0333	0.100
Silver	U		0.0333	0.100

Laboratory Control Sample (LCS)

(LCS) R4194598-2 04/03/25 00:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	10.0	10.0	100	80.0-120	
Barium	10.0	10.0	100	80.0-120	
Cadmium	10.0	9.70	97.0	80.0-120	
Chromium	10.0	9.98	99.8	80.0-120	
Lead	10.0	9.97	99.7	80.0-120	
Selenium	10.0	9.91	99.1	80.0-120	
Silver	2.00	2.04	102	80.0-120	

L1841339-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841339-02 04/03/25 00:35 • (MS) R4194598-4 04/03/25 00:38 • (MSD) R4194598-5 04/03/25 00:40

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	9.76	9.87	97.6	98.7	1	75.0-125			1.10	20
Barium	10.0	ND	9.89	10.0	97.9	99.1	1	75.0-125			1.23	20
Cadmium	10.0	ND	9.43	9.55	94.3	95.5	1	75.0-125			1.29	20
Chromium	10.0	ND	9.76	9.91	96.8	98.3	1	75.0-125			1.57	20
Lead	10.0	ND	9.63	9.87	96.3	98.7	1	75.0-125			2.47	20
Selenium	10.0	ND	9.49	9.90	94.9	99.0	1	75.0-125			4.25	20
Silver	2.00	ND	1.96	2.01	97.9	101	1	75.0-125			2.68	20

L1841339-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841339-05 04/03/25 00:42 • (MS) R4194598-6 04/03/25 00:44 • (MSD) R4194598-7 04/03/25 00:46

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Arsenic	10.0	ND	9.68	9.74	96.2	96.8	1	75.0-125			0.604	20
Barium	10.0	ND	9.89	9.97	98.9	99.7	1	75.0-125			0.735	20
Cadmium	10.0	ND	9.51	9.57	95.1	95.7	1	75.0-125			0.663	20
Chromium	10.0	0.817	10.6	10.8	98.3	99.4	1	75.0-125			1.08	20
Lead	10.0	ND	9.73	9.81	96.8	97.6	1	75.0-125			0.820	20
Selenium	10.0	ND	9.41	9.60	93.5	95.4	1	75.0-125			2.00	20
Silver	2.00	ND	2.00	1.99	99.9	99.6	1	75.0-125			0.235	20

Method Blank (MB)

(MB) R4195884-2 04/06/25 18:47

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	1.18	J	0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	*98.9*			*77.0-120*

Laboratory Control Sample (LCS)

(LCS) R4195884-1 04/06/25 17:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.00	4.75	95.0	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*109*	*77.0-120*	

Method Blank (MB)

(MB) R4195721-3 04/05/25 23:14

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Benzene	U		0.0167	0.0500
Carbon tetrachloride	U		0.0167	0.0500
Chlorobenzene	U		0.0167	0.0500
Chloroform	U		0.0833	0.250
1,2-Dichloroethane	U		0.0167	0.0500
1,1-Dichloroethene	U		0.0167	0.0500
2-Butanone (MEK)	U		0.167	0.500
Tetrachloroethene	U		0.0167	0.0500
Trichloroethene	U		0.0167	0.0500
Vinyl chloride	U		0.0167	0.0500
(S) Toluene-d8	*103*			*80.0-120*
(S) 4-Bromofluorobenzene	*97.3*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*101*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R4195721-1 04/05/25 21:52 • (LCSD) R4195721-2 04/05/25 22:12

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Benzene	0.250	0.250	0.263	100	105	70.0-123			5.07	20
Carbon tetrachloride	0.250	0.265	0.268	106	107	68.0-126			1.13	20
Chlorobenzene	0.250	0.252	0.261	101	104	80.0-121			3.51	20
Chloroform	0.250	0.256	0.265	102	106	73.0-120			3.45	20
1,2-Dichloroethane	0.250	0.255	0.264	102	106	70.0-128			3.47	20
1,1-Dichloroethene	0.250	0.266	0.264	106	106	71.0-124			0.755	20
2-Butanone (MEK)	1.25	0.965	0.749	77.2	59.9	44.0-160		J3	25.2	20
Tetrachloroethene	0.250	0.258	0.262	103	105	72.0-132			1.54	20
Trichloroethene	0.250	0.283	0.258	113	103	78.0-124			9.24	20
Vinyl chloride	0.250	0.240	0.248	96.0	99.2	67.0-131			3.28	20
(S) Toluene-d8				*99.2*	*99.2*	*80.0-120*				
(S) 4-Bromofluorobenzene				*101*	*99.3*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*99.2*	*98.5*	*70.0-130*				

L1841178-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1841178-01 04/06/25 00:56 • (MS) R4195721-4 04/06/25 07:03

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Benzene	0.250	ND	0.246	98.4	1	17.0-158	
Carbon tetrachloride	0.250	ND	0.267	107	1	23.0-159	
Chlorobenzene	0.250	ND	0.240	96.0	1	33.0-152	
Chloroform	0.250	ND	0.253	101	1	29.0-154	
1,2-Dichloroethane	0.250	ND	0.255	102	1	29.0-151	
1,1-Dichloroethene	0.250	ND	0.276	110	1	11.0-160	
2-Butanone (MEK)	1.25	ND	0.879	70.3	1	10.0-160	
Tetrachloroethene	0.250	ND	0.247	98.8	1	10.0-160	
Trichloroethene	0.250	ND	0.315	126	1	10.0-160	
Vinyl chloride	0.250	ND	0.263	105	1	10.0-160	
(S) Toluene-d8				*98.2*		*80.0-120*	
(S) 4-Bromofluorobenzene				*98.5*		*77.0-126*	
(S) 1,2-Dichloroethane-d4				*101*		*70.0-130*	

L1841335-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841335-02 04/06/25 03:39 • (MS) R4195721-6 04/06/25 07:23 • (MSD) R4195721-7 04/06/25 07:43

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.250	ND	0.252	0.255	101	102	1	17.0-158			1.18	27
Carbon tetrachloride	0.250	ND	0.268	0.277	107	111	1	23.0-159			3.30	28
Chlorobenzene	0.250	ND	0.239	0.240	95.6	96.0	1	33.0-152			0.418	27
Chloroform	0.250	ND	0.256	0.256	102	102	1	29.0-154			0.000	28
1,2-Dichloroethane	0.250	ND	0.261	0.256	104	102	1	29.0-151			1.93	27
1,1-Dichloroethene	0.250	ND	0.266	0.267	106	107	1	11.0-160			0.375	29
2-Butanone (MEK)	1.25	ND	0.728	0.756	58.2	60.5	1	10.0-160			3.77	32
Tetrachloroethene	0.250	ND	0.242	0.241	96.8	96.4	1	10.0-160			0.414	27
Trichloroethene	0.250	ND	0.251	0.248	100	99.2	1	10.0-160			1.20	25
Vinyl chloride	0.250	ND	0.261	0.259	104	104	1	10.0-160			0.769	27
(S) Toluene-d8					*98.6*	*99.9*		*80.0-120*				
(S) 4-Bromofluorobenzene					*97.8*	*99.1*		*77.0-126*				
(S) 1,2-Dichloroethane-d4					*102*	*99.7*		*70.0-130*				

Method Blank (MB)

(MB) R4195496-1 04/04/25 21:29

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	*74.5*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R4195496-2 04/04/25 21:43

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	39.3	78.6	50.0-150	
(S) o-Terphenyl			*95.0*	*18.0-148*	

L1841402-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841402-01 04/05/25 00:30 • (MS) R4195496-3 04/05/25 00:43 • (MSD) R4195496-4 04/05/25 00:57

Analyte	Spike Amount (dry) mg/kg	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	54.7	ND	41.0	42.7	75.1	77.5	1	50.0-150			4.04	20
(S) o-Terphenyl					*88.7*	*88.7*		*18.0-148*				

Method Blank (MB)

(MB) R4194922-1 04/03/25 00:41

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.0102	0.0340
PCB 1221	U		0.0107	0.0340
PCB 1232	U		0.0182	0.0340
PCB 1242	U		0.0101	0.0340
PCB 1248	U		0.0124	0.0170
PCB 1254	U		0.0104	0.0170
PCB 1260	U		0.0110	0.0170
(S) Decachlorobiphenyl	*73.3*			*10.0-135*
(S) Tetrachloro-m-xylene	*63.1*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R4194922-2 04/03/25 00:50

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1016	0.167	0.118	70.7	36.0-141	
PCB 1260	0.167	0.115	68.9	37.0-145	
(S) Decachlorobiphenyl			*79.1*	*10.0-135*	
(S) Tetrachloro-m-xylene			*70.6*	*10.0-139*	

L1841367-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1841367-01 04/03/25 01:19 • (MS) R4194922-3 04/03/25 01:29 • (MSD) R4194922-4 04/03/25 01:39

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1016	0.163	ND	0.0616	0.0963	37.8	58.7	1	10.0-160		J3	44.0	37
PCB 1260	0.163	ND	0.0620	0.0953	38.0	58.1	1	10.0-160		J3	42.3	38
(S) Decachlorobiphenyl					*46.2*	*70.1*		*10.0-135*				
(S) Tetrachloro-m-xylene					*40.0*	*57.5*		*10.0-139*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4196623-2 04/07/25 23:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
1,4-Dichlorobenzene	U		0.0333	0.100
2,4-Dinitrotoluene	U		0.0333	0.100
Hexachlorobenzene	U		0.0333	0.100
Hexachloro-1,3-butadiene	U		0.0333	0.100
Hexachloroethane	U		0.0333	0.100
Nitrobenzene	U		0.0333	0.100
Pyridine	U		0.0333	0.100
3&4-Methyl Phenol	U		0.0333	0.100
2-Methylphenol	U		0.0333	0.100
Pentachlorophenol	U		0.0333	0.100
2,4,5-Trichlorophenol	U		0.0333	0.100
2,4,6-Trichlorophenol	U		0.0333	0.100
(S) 2-Fluorophenol	*31.0*			*10.0-120*
(S) Phenol-d5	*21.3*			*10.0-120*
(S) Nitrobenzene-d5	*70.1*			*10.0-127*
(S) 2-Fluorobiphenyl	*55.5*			*10.0-130*
(S) 2,4,6-Tribromophenol	*52.5*			*10.0-155*
(S) p-Terphenyl-d14	*63.8*			*10.0-128*

Laboratory Control Sample (LCS)

(LCS) R4196623-1 04/07/25 23:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
1,4-Dichlorobenzene	0.500	0.289	57.8	18.0-120	
2,4-Dinitrotoluene	0.500	0.378	75.6	49.0-124	
Hexachlorobenzene	0.500	0.300	60.0	44.0-120	
Hexachloro-1,3-butadiene	0.500	0.307	61.4	19.0-120	
Hexachloroethane	0.500	0.318	63.6	15.0-120	
Nitrobenzene	0.500	0.344	68.8	27.0-120	
Pyridine	0.500	0.0729	14.6	10.0-120	
3&4-Methyl Phenol	0.500	0.266	53.2	31.0-120	
2-Methylphenol	0.500	0.251	50.2	28.0-120	
Pentachlorophenol	0.500	0.262	52.4	23.0-120	
2,4,5-Trichlorophenol	0.500	0.349	69.8	44.0-120	
2,4,6-Trichlorophenol	0.500	0.320	64.0	42.0-120	
(S) 2-Fluorophenol			*36.4*	*10.0-120*	
(S) Phenol-d5			*23.9*	*10.0-120*	
(S) Nitrobenzene-d5			*71.2*	*10.0-127*	

Laboratory Control Sample (LCS)

(LCS) R4196623-1 04/07/25 23:32

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
(S) 2-Fluorobiphenyl			*61.7*	*10.0-130*	
(S) 2,4,6-Tribromophenol			*59.0*	*10.0-155*	
(S) p-Terphenyl-d14			*59.6*	*10.0-128*	

L1837968-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1837968-01 04/08/25 05:32 • (MS) R4196623-3 04/08/25 05:53 • (MSD) R4196623-4 04/08/25 06:14

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
1,4-Dichlorobenzene	0.500	ND	0.284	0.254	56.8	50.8	1	17.0-120			11.2	40
2,4-Dinitrotoluene	0.500	ND	0.363	0.348	72.6	69.6	1	39.0-125			4.22	25
Hexachlorobenzene	0.500	ND	0.315	0.263	63.0	52.6	1	35.0-122			18.0	24
Hexachloro-1,3-butadiene	0.500	ND	0.319	0.276	63.8	55.2	1	12.0-120			14.5	34
Hexachloroethane	0.500	ND	0.315	0.275	63.0	55.0	1	10.0-120			13.6	40
Nitrobenzene	0.500	ND	0.351	0.318	70.2	63.6	1	12.0-120			9.87	30
Pyridine	0.500	ND	ND	ND	18.9	19.9	1	10.0-120			5.25	37
3&4-Methyl Phenol	0.500	ND	0.236	0.215	47.2	43.0	1	10.0-120			9.31	36
2-Methylphenol	0.500	ND	0.231	0.201	46.2	40.2	1	10.0-120			13.9	30
Pentachlorophenol	0.500	ND	0.243	0.214	48.6	42.8	1	10.0-128			12.7	37
2,4,5-Trichlorophenol	0.500	ND	0.345	0.306	69.0	61.2	1	33.0-120			12.0	31
2,4,6-Trichlorophenol	0.500	ND	0.335	0.293	67.0	58.6	1	26.0-120			13.4	31
(S) 2-Fluorophenol					*35.7*	*29.5*		*10.0-120*				
(S) Phenol-d5					*23.4*	*20.9*		*10.0-120*				
(S) Nitrobenzene-d5					*72.2*	*65.5*		*10.0-127*				
(S) 2-Fluorobiphenyl					*61.4*	*53.9*		*10.0-130*				
(S) 2,4,6-Tribromophenol					*62.0*	*56.0*		*10.0-155*				
(S) p-Terphenyl-d14					*56.2*	*50.9*		*10.0-128*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
C3	The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Method sensitivity check is acceptable.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
T8	Sample(s) received past/too close to holding time expiration.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1,6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1,4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Civil & Environmental Consultants - PA

700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:
Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # 1841391

E004

Acctnum: **CECPPA**
Template: **T270505**
Prelogin: **P1139368**
PM: **3564 - Chad A Upchurch**
PB: 3|20|25 BK
Shipped Via: **FedEX Ground**

Report to:
Laura Campbell 800-365-2324

Email To: lcampbell@cecinc.com

Project Description:
Benwood Shredder Fluff

City/State Collected: Benwood WV

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
335-863

Lab Project #
CECPPA-BENWOOD

Collected by (print): Sarah Van Horn

Site/Facility ID #
AMG

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day ___ STD TAT

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y ✓

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres								Remarks	Sample # (lab only)
SF-3	Comp	SS		3-27-25	1630	2			X									-01
SF-3	Comp	SS		3-27-25	1630	2	X	X										-02

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking # 443924451442

Sample Receipt Checklist
COC Seal Present/Intact: __NP [✓ Y] __N
COC Signed/Accurate: [✓ Y] __N
Bottles arrive intact: [✓ Y] __N
Correct bottles used: [✓ Y] __N
Sufficient volume sent: [✓ Y] __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: [✓ Y] __N

Relinquished by : (Signature)	Date: 3-27-25	Time: 2000	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received:
TLA 92.0+0.4=2.4

Date: 3/28/25 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / [✓ OK]

ANALYTICAL REPORT

May 14, 2025

Revised Report

Civil & Environmental Consultants - PA

Sample Delivery Group:	L1843848
Samples Received:	04/04/2025
Project Number:	334-094
Description:	Benwood Shredder Fluff

Report To:

Laura Campbell
700 Cherrington Parkway
Moon Township, PA 15108

Entire Report Reviewed By:

Chad A Upchurch
Project Manager

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

TABLE OF CONTENTS

SAMPLE SUMMARY

SF-4 L1843848-01

Collected by	Collected date/time	Received date/time
Sarah Van Horn	03/31/25 16:30	04/04/25 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG2485962	1	04/09/25 15:20	04/09/25 15:20	BTP	Mt. Juliet, TN
Preparation by Method 1311	WG2485980	1	04/09/25 10:39	04/09/25 10:39	JWS	Mt. Juliet, TN
Mercury by Method 7470A	WG2487339	1	04/10/25 14:18	04/11/25 16:28	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2487625	1	04/10/25 16:39	04/10/25 23:18	MAP	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2487195	1	04/12/25 17:47	04/12/25 17:47	WHS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG2487406	1	04/10/25 16:12	04/11/25 03:11	JRM	Mt. Juliet, TN

SF-4 L1843848-02

Collected by	Collected date/time	Received date/time
Sarah Van Horn	03/31/25 16:30	04/04/25 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2485944	1	04/09/25 08:50	04/09/25 08:58	MT	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2488839	500	03/31/25 16:30	04/12/25 22:22	CDD	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG2485958	1000	04/09/25 08:58	04/10/25 04:04	KKS	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2485953	16.2	04/09/25 10:49	04/11/25 00:08	RDH	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2485953	3.23	04/09/25 10:49	04/10/25 03:20	RDH	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2485953	3.23	04/09/25 10:49	04/11/25 00:29	RDH	Mt. Juliet, TN

SF-5 L1843848-03

Collected by	Collected date/time	Received date/time
Sarah Van Horn	04/01/25 11:45	04/04/25 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG2485962	1	04/09/25 15:20	04/09/25 15:20	BTP	Mt. Juliet, TN
Preparation by Method 1311	WG2485980	1	04/09/25 10:39	04/09/25 10:39	JWS	Mt. Juliet, TN
Mercury by Method 7470A	WG2487339	1	04/10/25 14:18	04/11/25 16:31	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2487625	1	04/10/25 16:39	04/10/25 23:20	MAP	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2487195	1	04/12/25 18:08	04/12/25 18:08	WHS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG2487406	1	04/10/25 16:12	04/11/25 05:58	JRM	Mt. Juliet, TN

SF-5 L1843848-04

Collected by	Collected date/time	Received date/time
Sarah Van Horn	04/01/25 11:45	04/04/25 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2485944	1	04/09/25 08:50	04/09/25 08:58	MT	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2490342	500	04/01/25 11:45	04/15/25 01:37	CDD	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG2485958	1000	04/09/25 08:58	04/10/25 04:16	KKS	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2485953	3.73	04/09/25 10:49	04/10/25 03:02	RDH	Mt. Juliet, TN

SF-6 L1843848-05

Collected by	Collected date/time	Received date/time
Sarah Van Horn	04/03/25 16:00	04/04/25 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG2485962	1	04/09/25 15:20	04/09/25 15:20	BTP	Mt. Juliet, TN
Preparation by Method 1311	WG2485980	1	04/09/25 10:39	04/09/25 10:39	JWS	Mt. Juliet, TN
Mercury by Method 7470A	WG2487339	1	04/10/25 14:18	04/11/25 16:34	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2487625	1	04/10/25 16:39	04/10/25 23:21	MAP	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2487195	1	04/12/25 18:30	04/12/25 18:30	WHS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG2487406	1	04/10/25 16:12	04/11/25 06:19	JRM	Mt. Juliet, TN

SAMPLE SUMMARY

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

SF-6 L1843848-06

Collected by	Collected date/time	Received date/time
Sarah Van Horn	04/03/25 16:00	04/04/25 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2485945	1	04/09/25 09:01	04/09/25 09:12	MT	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2490342	100	04/03/25 16:00	04/15/25 01:59	CDD	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG2485958	1000	04/09/25 08:58	04/10/25 04:29	KKS	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2485953	3	04/09/25 10:49	04/10/25 03:11	RDH	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2485953	30	04/09/25 10:49	04/11/25 00:18	RDH	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chad A Upchurch
Project Manager

Report Revision History

Level II Report - Version 1: 04/16/25 15:50

Project Narrative

L1843848-02, L1843848-04, L1843848-06: Reporting on dry weight corrected basis, per request.

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/9/2025 10:39:50 AM	WG2485980
TCLP ZHE Extraction	-		4/9/2025 3:20:35 PM	WG2485962
Initial pH	8.33		4/9/2025 10:39:50 AM	WG2485980
Final pH	5.96		4/9/2025 10:39:50 AM	WG2485980

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/11/2025 16:28	WG2487339

Metals (ICP) by Method 6010D

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	04/10/2025 23:18	WG2487625
Barium	0.363		0.100	100	1	04/10/2025 23:18	WG2487625
Cadmium	0.145		0.100	1	1	04/10/2025 23:18	WG2487625
Chromium	ND		0.100	5	1	04/10/2025 23:18	WG2487625
Lead	0.173		0.100	5	1	04/10/2025 23:18	WG2487625
Selenium	ND		0.100	1	1	04/10/2025 23:18	WG2487625
Silver	ND		0.100	5	1	04/10/2025 23:18	WG2487625

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/12/2025 17:47	WG2487195
Carbon tetrachloride	ND		0.0500	0.50	1	04/12/2025 17:47	WG2487195
Chlorobenzene	ND		0.0500	100	1	04/12/2025 17:47	WG2487195
Chloroform	ND		0.250	6	1	04/12/2025 17:47	WG2487195
1,2-Dichloroethane	ND		0.0500	0.50	1	04/12/2025 17:47	WG2487195
1,1-Dichloroethene	ND		0.0500	0.70	1	04/12/2025 17:47	WG2487195
2-Butanone (MEK)	ND	J3	0.500	200	1	04/12/2025 17:47	WG2487195
Tetrachloroethene	ND		0.0500	0.70	1	04/12/2025 17:47	WG2487195
Trichloroethene	ND		0.0500	0.50	1	04/12/2025 17:47	WG2487195
Vinyl chloride	ND		0.0500	0.20	1	04/12/2025 17:47	WG2487195
(S) Toluene-d8	*110*		*80.0-120*			*04/12/2025 17:47*	WG2487195
(S) 4-Bromofluorobenzene	*94.9*		*77.0-126*			*04/12/2025 17:47*	WG2487195
(S) 1,2-Dichloroethane-d4	*100*		*70.0-130*			*04/12/2025 17:47*	WG2487195

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/11/2025 03:11	WG2487406
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/11/2025 03:11	WG2487406
Hexachlorobenzene	ND		0.100	0.13	1	04/11/2025 03:11	WG2487406
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/11/2025 03:11	WG2487406
Hexachloroethane	ND		0.100	3	1	04/11/2025 03:11	WG2487406
Nitrobenzene	ND		0.100	2	1	04/11/2025 03:11	WG2487406
Pyridine	ND		0.100	5	1	04/11/2025 03:11	WG2487406
3&4-Methyl Phenol	ND		0.100	400	1	04/11/2025 03:11	WG2487406
2-Methylphenol	ND		0.100	200	1	04/11/2025 03:11	WG2487406
Pentachlorophenol	ND		0.100	100	1	04/11/2025 03:11	WG2487406
2,4,5-Trichlorophenol	ND		0.100	400	1	04/11/2025 03:11	WG2487406
2,4,6-Trichlorophenol	ND		0.100	2	1	04/11/2025 03:11	WG2487406
(S) 2-Fluorophenol	*32.0*		*10.0-120*			*04/11/2025 03:11*	WG2487406

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
(S) Phenol-d5	*22.8*		*10.0-120*			*04/11/2025 03:11*	WG2487406
(S) Nitrobenzene-d5	*67.7*		*10.0-127*			*04/11/2025 03:11*	WG2487406
(S) 2-Fluorobiphenyl	*47.9*		*10.0-130*			*04/11/2025 03:11*	WG2487406
(S) 2,4,6-Tribromophenol	*52.0*		*10.0-155*			*04/11/2025 03:11*	WG2487406
(S) p-Terphenyl-d14	*55.4*		*10.0-128*			*04/11/2025 03:11*	WG2487406

SF-4

Collected date/time: 03/31/25 16:30

SAMPLE RESULTS - 02

L1843848

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	70.6		1	04/09/2025 08:58	WG2485944

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	183	B	95.4	500	04/12/2025 22:22	WG2488839
(S) a,a,a-Trifluorotoluene(FID)	*95.1*		*77.0-120*		*04/12/2025 22:22*	WG2488839

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	ND		5660	1000	04/10/2025 04:04	WG2485958
C28-C40 Oil Range	15400		5660	1000	04/10/2025 04:04	WG2485958
(S) o-Terphenyl	*0.000*	J7	*18.0-148*		*04/10/2025 04:04*	WG2485958

Sample Narrative:

L1843848-02 WG2485958: Cannot run at lower dilution due to viscosity of extract

Polychlorinated Biphenyls (GC) by Method 8082 A

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.156	3.23	04/10/2025 03:20	WG2485953
PCB 1221	ND		0.156	3.23	04/10/2025 03:20	WG2485953
PCB 1232	ND		0.156	3.23	04/10/2025 03:20	WG2485953
PCB 1242	9.97		0.780	16.2	04/11/2025 00:08	WG2485953
PCB 1248	ND		0.0777	3.23	04/10/2025 03:20	WG2485953
PCB 1254	3.72	P	0.0777	3.23	04/11/2025 00:29	WG2485953
PCB 1260	ND		0.0777	3.23	04/10/2025 03:20	WG2485953
(S) Decachlorobiphenyl	*63.3*		*10.0-135*		*04/10/2025 03:20*	WG2485953
(S) Decachlorobiphenyl	*230*	J1	*10.0-135*		*04/11/2025 00:29*	WG2485953
(S) Decachlorobiphenyl	*51.2*		*10.0-135*		*04/11/2025 00:08*	WG2485953
(S) Tetrachloro-m-xylene	*66.0*		*10.0-139*		*04/11/2025 00:08*	WG2485953
(S) Tetrachloro-m-xylene	*98.1*		*10.0-139*		*04/11/2025 00:29*	WG2485953
(S) Tetrachloro-m-xylene	*47.4*		*10.0-139*		*04/10/2025 03:20*	WG2485953

Sample Narrative:

L1843848-02 WG2485953: Surrogate failure due to matrix interference.

SF-5

Collected date/time: 04/01/25 11:45

SAMPLE RESULTS - 03

L1843848

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Preparation by Method 1311

	Result	Qualifier	Prep	Batch
Analyte			date / time	
TCLP Extraction	-		4/9/2025 10:39:50 AM	WG2485980
TCLP ZHE Extraction	-		4/9/2025 3:20:35 PM	WG2485962
Initial pH	7.62		4/9/2025 10:39:50 AM	WG2485980
Final pH	5.97		4/9/2025 10:39:50 AM	WG2485980

Mercury by Method 7470A

	Result	Qualifier	RDL	Limit	Dilution	Analysis	Batch
Analyte	mg/l		mg/l	mg/l		date / time	
Mercury	ND		0.0100	0.20	1	04/11/2025 16:31	WG2487339

Metals (ICP) by Method 6010D

	Result	Qualifier	RDL	Limit	Dilution	Analysis	Batch
Analyte	mg/l		mg/l	mg/l		date / time	
Arsenic	ND		0.100	5	1	04/10/2025 23:20	WG2487625
Barium	0.535		0.100	100	1	04/10/2025 23:20	WG2487625
Cadmium	0.141		0.100	1	1	04/10/2025 23:20	WG2487625
Chromium	ND		0.100	5	1	04/10/2025 23:20	WG2487625
Lead	0.408		0.100	5	1	04/10/2025 23:20	WG2487625
Selenium	ND		0.100	1	1	04/10/2025 23:20	WG2487625
Silver	ND		0.100	5	1	04/10/2025 23:20	WG2487625

Volatile Organic Compounds (GC/MS) by Method 8260B

	Result	Qualifier	RDL	Limit	Dilution	Analysis	Batch
Analyte	mg/l		mg/l	mg/l		date / time	
Benzene	ND		0.0500	0.50	1	04/12/2025 18:08	WG2487195
Carbon tetrachloride	ND		0.0500	0.50	1	04/12/2025 18:08	WG2487195
Chlorobenzene	ND		0.0500	100	1	04/12/2025 18:08	WG2487195
Chloroform	ND		0.250	6	1	04/12/2025 18:08	WG2487195
1,2-Dichloroethane	ND		0.0500	0.50	1	04/12/2025 18:08	WG2487195
1,1-Dichloroethene	ND		0.0500	0.70	1	04/12/2025 18:08	WG2487195
2-Butanone (MEK)	ND	J3	0.500	200	1	04/12/2025 18:08	WG2487195
Tetrachloroethene	ND		0.0500	0.70	1	04/12/2025 18:08	WG2487195
Trichloroethene	ND		0.0500	0.50	1	04/12/2025 18:08	WG2487195
Vinyl chloride	ND		0.0500	0.20	1	04/12/2025 18:08	WG2487195
(S) Toluene-d8	*107*		*80.0-120*			*04/12/2025 18:08*	WG2487195
(S) 4-Bromofluorobenzene	*94.1*		*77.0-126*			*04/12/2025 18:08*	WG2487195
(S) 1,2-Dichloroethane-d4	*100*		*70.0-130*			*04/12/2025 18:08*	WG2487195

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

	Result	Qualifier	RDL	Limit	Dilution	Analysis	Batch
Analyte	mg/l		mg/l	mg/l		date / time	
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/11/2025 05:58	WG2487406
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/11/2025 05:58	WG2487406
Hexachlorobenzene	ND		0.100	0.13	1	04/11/2025 05:58	WG2487406
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/11/2025 05:58	WG2487406
Hexachloroethane	ND		0.100	3	1	04/11/2025 05:58	WG2487406
Nitrobenzene	ND		0.100	2	1	04/11/2025 05:58	WG2487406
Pyridine	ND		0.100	5	1	04/11/2025 05:58	WG2487406
3&4-Methyl Phenol	ND		0.100	400	1	04/11/2025 05:58	WG2487406
2-Methylphenol	ND		0.100	200	1	04/11/2025 05:58	WG2487406
Pentachlorophenol	ND		0.100	100	1	04/11/2025 05:58	WG2487406
2,4,5-Trichlorophenol	ND		0.100	400	1	04/11/2025 05:58	WG2487406
2,4,6-Trichlorophenol	ND		0.100	2	1	04/11/2025 05:58	WG2487406
(S) 2-Fluorophenol	*35.4*		*10.0-120*			*04/11/2025 05:58*	WG2487406

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
(S) Phenol-d5	*24.7*		*10.0-120*			*04/11/2025 05:58*	WG2487406
(S) Nitrobenzene-d5	*71.4*		*10.0-127*			*04/11/2025 05:58*	WG2487406
(S) 2-Fluorobiphenyl	*50.7*		*10.0-130*			*04/11/2025 05:58*	WG2487406
(S) 2,4,6-Tribromophenol	*50.5*		*10.0-155*			*04/11/2025 05:58*	WG2487406
(S) p-Terphenyl-d14	*65.9*		*10.0-128*			*04/11/2025 05:58*	WG2487406

SF-5
Collected date/time: 04/01/25 11:45

SAMPLE RESULTS - 04

L1843848

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	71.4		1	04/09/2025 08:58	WG2485944

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	280		95.2	500	04/15/2025 01:37	WG2490342
(S) a,a,a-Trifluorotoluene(FID)	*93.0*		*77.0-120*		*04/15/2025 01:37*	WG2490342

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	11000		5600	1000	04/10/2025 04:16	WG2485958
C28-C40 Oil Range	17600		5600	1000	04/10/2025 04:16	WG2485958
(S) o-Terphenyl	*0.000*	J7	*18.0-148*		*04/10/2025 04:16*	WG2485958

Polychlorinated Biphenyls (GC) by Method 8082 A

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.178	3.73	04/10/2025 03:02	WG2485953
PCB 1221	ND		0.178	3.73	04/10/2025 03:02	WG2485953
PCB 1232	ND		0.178	3.73	04/10/2025 03:02	WG2485953
PCB 1242	3.40		0.178	3.73	04/10/2025 03:02	WG2485953
PCB 1248	ND		0.0888	3.73	04/10/2025 03:02	WG2485953
PCB 1254	1.51		0.0888	3.73	04/10/2025 03:02	WG2485953
PCB 1260	ND		0.0888	3.73	04/10/2025 03:02	WG2485953
(S) Decachlorobiphenyl	*58.9*		*10.0-135*		*04/10/2025 03:02*	WG2485953
(S) Tetrachloro-m-xylene	*44.0*		*10.0-139*		*04/10/2025 03:02*	WG2485953

Sample Narrative:

L1843848-04 WG2485953: Dilution due to matrix impact during extraction procedure

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/9/2025 10:39:50 AM	WG2485980
TCLP ZHE Extraction	-		4/9/2025 3:20:35 PM	WG2485962
Initial pH	9.00		4/9/2025 10:39:50 AM	WG2485980
Final pH	6.22		4/9/2025 10:39:50 AM	WG2485980

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/11/2025 16:34	WG2487339

Metals (ICP) by Method 6010D

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	04/10/2025 23:21	WG2487625
Barium	0.633		0.100	100	1	04/10/2025 23:21	WG2487625
Cadmium	0.113		0.100	1	1	04/10/2025 23:21	WG2487625
Chromium	ND		0.100	5	1	04/10/2025 23:21	WG2487625
Lead	0.355		0.100	5	1	04/10/2025 23:21	WG2487625
Selenium	ND		0.100	1	1	04/10/2025 23:21	WG2487625
Silver	ND		0.100	5	1	04/10/2025 23:21	WG2487625

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/12/2025 18:30	WG2487195
Carbon tetrachloride	ND		0.0500	0.50	1	04/12/2025 18:30	WG2487195
Chlorobenzene	ND		0.0500	100	1	04/12/2025 18:30	WG2487195
Chloroform	ND		0.250	6	1	04/12/2025 18:30	WG2487195
1,2-Dichloroethane	ND		0.0500	0.50	1	04/12/2025 18:30	WG2487195
1,1-Dichloroethene	ND		0.0500	0.70	1	04/12/2025 18:30	WG2487195
2-Butanone (MEK)	ND	J3	0.500	200	1	04/12/2025 18:30	WG2487195
Tetrachloroethene	ND		0.0500	0.70	1	04/12/2025 18:30	WG2487195
Trichloroethene	ND		0.0500	0.50	1	04/12/2025 18:30	WG2487195
Vinyl chloride	ND		0.0500	0.20	1	04/12/2025 18:30	WG2487195
(S) Toluene-d8	*108*		*80.0-120*			*04/12/2025 18:30*	WG2487195
(S) 4-Bromofluorobenzene	*93.3*		*77.0-126*			*04/12/2025 18:30*	WG2487195
(S) 1,2-Dichloroethane-d4	*100*		*70.0-130*			*04/12/2025 18:30*	WG2487195

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/11/2025 06:19	WG2487406
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/11/2025 06:19	WG2487406
Hexachlorobenzene	ND		0.100	0.13	1	04/11/2025 06:19	WG2487406
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/11/2025 06:19	WG2487406
Hexachloroethane	ND		0.100	3	1	04/11/2025 06:19	WG2487406
Nitrobenzene	ND		0.100	2	1	04/11/2025 06:19	WG2487406
Pyridine	ND		0.100	5	1	04/11/2025 06:19	WG2487406
3&4-Methyl Phenol	ND		0.100	400	1	04/11/2025 06:19	WG2487406
2-Methylphenol	ND		0.100	200	1	04/11/2025 06:19	WG2487406
Pentachlorophenol	ND		0.100	100	1	04/11/2025 06:19	WG2487406
2,4,5-Trichlorophenol	ND		0.100	400	1	04/11/2025 06:19	WG2487406
2,4,6-Trichlorophenol	ND		0.100	2	1	04/11/2025 06:19	WG2487406
(S) 2-Fluorophenol	*28.9*		*10.0-120*			*04/11/2025 06:19*	WG2487406

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
(S) Phenol-d5	*22.2*		*10.0-120*			*04/11/2025 06:19*	WG2487406
(S) Nitrobenzene-d5	*68.1*		*10.0-127*			*04/11/2025 06:19*	WG2487406
(S) 2-Fluorobiphenyl	*48.4*		*10.0-130*			*04/11/2025 06:19*	WG2487406
(S) 2,4,6-Tribromophenol	*51.0*		*10.0-155*			*04/11/2025 06:19*	WG2487406
(S) p-Terphenyl-d14	*59.5*		*10.0-128*			*04/11/2025 06:19*	WG2487406

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	71.2		1	04/09/2025 09:12	WG2485945

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	270		20.5	100	04/15/2025 01:59	WG2490342
(S) a,a,a-Trifluorotoluene(FID)	*93.6*		*77.0-120*		*04/15/2025 01:59*	WG2490342

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	8540		5620	1000	04/10/2025 04:29	WG2485958
C28-C40 Oil Range	15000		5620	1000	04/10/2025 04:29	WG2485958
(S) o-Terphenyl	*0.000*	J7	*18.0-148*		*04/10/2025 04:29*	WG2485958

Polychlorinated Biphenyls (GC) by Method 8082 A

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.143	3	04/10/2025 03:11	WG2485953
PCB 1221	ND		0.143	3	04/10/2025 03:11	WG2485953
PCB 1232	ND		0.143	3	04/10/2025 03:11	WG2485953
PCB 1242	37.3		1.43	30	04/11/2025 00:18	WG2485953
PCB 1248	ND		0.0716	3	04/10/2025 03:11	WG2485953
PCB 1254	5.84	P	0.716	30	04/11/2025 00:18	WG2485953
PCB 1260	ND		0.0716	3	04/10/2025 03:11	WG2485953
(S) Decachlorobiphenyl	*77.0*		*10.0-135*		*04/11/2025 00:18*	WG2485953
(S) Decachlorobiphenyl	*185*	J1	*10.0-135*		*04/10/2025 03:11*	WG2485953
(S) Tetrachloro-m-xylene	*63.0*		*10.0-139*		*04/11/2025 00:18*	WG2485953
(S) Tetrachloro-m-xylene	*73.0*		*10.0-139*		*04/10/2025 03:11*	WG2485953

Sample Narrative:

L1843848-06 WG2485953: Dilution due to matrix impact during extraction procedure

Method Blank (MB)

(MB) R4197296-1 04/09/25 08:58

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	%		%	%
Total Solids	0.000			

L1844881-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1844881-03 04/09/25 08:58 • (DUP) R4197296-3 04/09/25 08:58

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	80.0	81.8	1	2.20		10

Laboratory Control Sample (LCS)

(LCS) R4197296-2 04/09/25 08:58

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	90.0-110	

Method Blank (MB)

(MB) R4197299-1 04/09/25 09:12

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	%		%	%
Total Solids	0.000			

L1842817-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1842817-10 04/09/25 09:12 • (DUP) R4197299-3 04/09/25 09:12

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	87.7	85.2	1	2.88		10

Laboratory Control Sample (LCS)

(LCS) R4197299-2 04/09/25 09:12

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	90.0-110	

Method Blank (MB)

(MB) R4198529-1 04/11/25 16:05

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.00333	0.0100

Laboratory Control Sample (LCS)

(LCS) R4198529-2 04/11/25 16:08

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.0300	0.0308	103	80.0-120	

L1844643-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1844643-01 04/11/25 16:10 • (MS) R4198529-4 04/11/25 16:21 • (MSD) R4198529-5 04/11/25 16:23

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0315	0.0317	105	106	1	75.0-125			0.352	20

WG2487625

Metals (ICP) by Method 6010D

QUALITY CONTROL SUMMARY

L1843848-01,03,05

Method Blank (MB)

(MB) R4198075-1 04/10/25 23:08

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.0333	0.100
Barium	U		0.0333	0.100
Cadmium	U		0.0333	0.100
Chromium	U		0.0333	0.100
Lead	U		0.0333	0.100
Selenium	U		0.0333	0.100
Silver	U		0.0333	0.100

Laboratory Control Sample (LCS)

(LCS) R4198075-2 04/10/25 23:10

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	10.0	9.81	98.1	80.0-120	
Barium	10.0	9.38	93.8	80.0-120	
Cadmium	10.0	9.35	93.5	80.0-120	
Chromium	10.0	9.84	98.4	80.0-120	
Lead	10.0	9.42	94.2	80.0-120	
Selenium	10.0	9.18	91.8	80.0-120	
Silver	2.00	1.91	95.6	80.0-120	

L1844518-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1844518-01 04/10/25 23:11 • (MS) R4198075-4 04/10/25 23:15 • (MSD) R4198075-5 04/10/25 23:16

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	9.60	9.75	96.0	97.5	1	75.0-125			1.54	20
Barium	10.0	0.468	9.74	9.91	92.8	94.5	1	75.0-125			1.73	20
Cadmium	10.0	ND	9.25	9.36	92.5	93.6	1	75.0-125			1.17	20
Chromium	10.0	ND	9.73	9.94	97.3	99.4	1	75.0-125			2.17	20
Lead	10.0	ND	9.43	9.52	94.3	95.2	1	75.0-125			0.892	20
Selenium	10.0	ND	9.10	9.18	91.0	91.8	1	75.0-125			0.866	20
Silver	2.00	ND	1.90	1.92	95.2	96.2	1	75.0-125			1.02	20

WG2488839

Volatile Organic Compounds (GC) by Method 8015D/GRO

QUALITY CONTROL SUMMARY

L1843848-02

Method Blank (MB)

(MB) R4199255-2 04/12/25 15:21

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.559	J	0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	*90.8*			*77.0-120*

Laboratory Control Sample (LCS)

(LCS) R4199255-1 04/12/25 13:59

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.00	4.34	86.8	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*96.3*	*77.0-120*	

L1844873-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1844873-01 04/12/25 16:59 • (MS) R4199255-3 04/13/25 00:28 • (MSD) R4199255-4 04/13/25 00:50

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	126	ND	101	77.8	80.4	61.7	25	10.0-151			26.3	28
(S) a,a,a-Trifluorotoluene(FID)					*97.5*	*97.2*		*77.0-120*				

QUALITY CONTROL SUMMARY

L1843848-04,06

Method Blank (MB)

(MB) R4199628-2 04/14/25 23:44

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	*86.7*			*77.0-120*

Laboratory Control Sample (LCS)

(LCS) R4199628-1 04/14/25 22:03

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.00	5.23	105	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*100*	*77.0-120*	

Method Blank (MB)

(MB) R4198884-3 04/12/25 14:31

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Benzene	U		0.0167	0.0500
Carbon tetrachloride	U		0.0167	0.0500
Chlorobenzene	U		0.0167	0.0500
Chloroform	U		0.0833	0.250
1,2-Dichloroethane	U		0.0167	0.0500
1,1-Dichloroethene	U		0.0167	0.0500
2-Butanone (MEK)	U		0.167	0.500
Tetrachloroethene	U		0.0167	0.0500
Trichloroethene	U		0.0167	0.0500
Vinyl chloride	U		0.0167	0.0500
(S) Toluene-d8	*108*			*80.0-120*
(S) 4-Bromofluorobenzene	*94.8*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*98.6*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R4198884-1 04/12/25 10:34 • (LCSD) R4198884-2 04/12/25 12:24

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Benzene	0.250	0.216	0.226	86.4	90.4	70.0-123			4.52	20
Carbon tetrachloride	0.250	0.201	0.212	80.4	84.8	68.0-126			5.33	20
Chlorobenzene	0.250	0.218	0.223	87.2	89.2	80.0-121			2.27	20
Chloroform	0.250	0.219	0.223	87.6	89.2	73.0-120			1.81	20
1,2-Dichloroethane	0.250	0.221	0.225	88.4	90.0	70.0-128			1.79	20
1,1-Dichloroethene	0.250	0.207	0.218	82.8	87.2	71.0-124			5.18	20
2-Butanone (MEK)	1.25	1.62	1.17	130	93.6	44.0-160		J3	32.3	20
Tetrachloroethene	0.250	0.216	0.219	86.4	87.6	72.0-132			1.38	20
Trichloroethene	0.250	0.203	0.204	81.2	81.6	78.0-124			0.491	20
Vinyl chloride	0.250	0.207	0.210	82.8	84.0	67.0-131			1.44	20
(S) Toluene-d8				*102*	*103*	*80.0-120*				
(S) 4-Bromofluorobenzene				*91.1*	*91.8*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*97.5*	*96.2*	*70.0-130*				

L1844951-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1844951-02 04/12/25 17:25 • (MS) R4198884-4 04/12/25 21:46

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Benzene	0.250	ND	0.202	80.8	1	17.0-158	
Carbon tetrachloride	0.250	ND	0.200	80.0	1	23.0-159	
Chlorobenzene	0.250	ND	0.201	80.4	1	33.0-152	
Chloroform	0.250	ND	ND	83.6	1	29.0-154	
1,2-Dichloroethane	0.250	ND	0.211	84.4	1	29.0-151	
1,1-Dichloroethene	0.250	ND	0.194	77.6	1	11.0-160	
2-Butanone (MEK)	1.25	ND	1.37	110	1	10.0-160	
Tetrachloroethene	0.250	ND	0.212	84.8	1	10.0-160	
Trichloroethene	0.250	ND	0.220	88.0	1	10.0-160	
Vinyl chloride	0.250	ND	0.207	82.8	1	10.0-160	
(S) Toluene-d8				*103*		*80.0-120*	
(S) 4-Bromofluorobenzene				*91.8*		*77.0-126*	
(S) 1,2-Dichloroethane-d4				*97.7*		*70.0-130*	

L1845059-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1845059-01 04/12/25 20:19 • (MS) R4198884-6 04/12/25 22:08 • (MSD) R4198884-7 04/12/25 22:29

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.250	ND	0.251	0.190	100	76.0	1	17.0-158		J3	27.7	27
Carbon tetrachloride	0.250	ND	0.245	0.182	98.0	72.8	1	23.0-159		J3	29.5	28
Chlorobenzene	0.250	ND	0.249	0.186	99.6	74.4	1	33.0-152		J3	29.0	27
Chloroform	0.250	ND	0.253	ND	101	75.2	1	29.0-154		J3	29.5	28
1,2-Dichloroethane	0.250	ND	0.249	0.189	99.6	75.6	1	29.0-151		J3	27.4	27
1,1-Dichloroethene	0.250	ND	0.247	0.185	98.8	74.0	1	11.0-160			28.7	29
2-Butanone (MEK)	1.25	ND	1.30	0.919	104	73.5	1	10.0-160		J3	34.3	32
Tetrachloroethene	0.250	ND	0.256	0.190	102	76.0	1	10.0-160		J3	29.6	27
Trichloroethene	0.250	ND	0.232	0.171	92.8	68.4	1	10.0-160		J3	30.3	25
Vinyl chloride	0.250	ND	0.245	0.182	98.0	72.8	1	10.0-160		J3	29.5	27
(S) Toluene-d8					*103*	*102*		*80.0-120*				
(S) 4-Bromofluorobenzene					*90.8*	*89.4*		*77.0-126*				
(S) 1,2-Dichloroethane-d4					*100*	*97.2*		*70.0-130*				

QUALITY CONTROL SUMMARY

L1843848-02,04,06

Method Blank (MB)

(MB) R4197528-1 04/09/25 23:32

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	*61.7*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R4197528-2 04/09/25 23:44

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	35.6	71.2	50.0-150	
(S) o-Terphenyl			*61.7*	*18.0-148*	

L1844217-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1844217-03 04/10/25 02:25 • (MS) R4197528-3 04/10/25 02:38 • (MSD) R4197528-4 04/10/25 02:50

Analyte	Spike Amount (dry) mg/kg	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	51.0	16.0	55.1	43.0	76.7	52.9	1	50.0-150		J3	24.7	20
(S) o-Terphenyl					*60.0*	*48.6*		*18.0-148*				

Method Blank (MB)

(MB) R4197726-1 04/10/25 00:24

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.0102	0.0340
PCB 1221	U		0.0107	0.0340
PCB 1232	U		0.0182	0.0340
PCB 1242	U		0.0101	0.0340
PCB 1248	U		0.0124	0.0170
PCB 1254	U		0.0104	0.0170
PCB 1260	U		0.0110	0.0170
(S) Decachlorobiphenyl	*88.6*			*10.0-135*
(S) Tetrachloro-m-xylene	*76.3*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R4197726-5 04/10/25 00:42

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1016	0.167	0.134	80.2	36.0-141	
PCB 1260	0.167	0.138	82.6	37.0-145	
(S) Decachlorobiphenyl			*77.3*	*10.0-135*	
(S) Tetrachloro-m-xylene			*73.1*	*10.0-139*	

L1843992-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1843992-01 04/10/25 05:19 • (MS) R4197726-6 04/10/25 05:28 • (MSD) R4197726-7 04/10/25 05:37

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1016	0.191	ND	0.159	0.156	83.4	82.1	1	10.0-160			2.23	37
PCB 1260	0.191	ND	0.167	0.162	87.7	85.2	1	10.0-160			3.56	38
(S) Decachlorobiphenyl					*89.7*	*78.0*		*10.0-135*				
(S) Tetrachloro-m-xylene					*75.8*	*69.7*		*10.0-139*				

Method Blank (MB)

(MB) R4198300-2 04/10/25 23:40

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
1,4-Dichlorobenzene	U		0.0333	0.100
2,4-Dinitrotoluene	U		0.0333	0.100
Hexachlorobenzene	U		0.0333	0.100
Hexachloro-1,3-butadiene	U		0.0333	0.100
Hexachloroethane	U		0.0333	0.100
Nitrobenzene	U		0.0333	0.100
Pyridine	U		0.0333	0.100
3&4-Methyl Phenol	U		0.0333	0.100
2-Methylphenol	U		0.0333	0.100
Pentachlorophenol	U		0.0333	0.100
2,4,5-Trichlorophenol	U		0.0333	0.100
2,4,6-Trichlorophenol	U		0.0333	0.100
(S) 2-Fluorophenol	*26.9*			*10.0-120*
(S) Phenol-d5	*19.7*			*10.0-120*
(S) Nitrobenzene-d5	*63.3*			*10.0-127*
(S) 2-Fluorobiphenyl	*47.5*			*10.0-130*
(S) 2,4,6-Tribromophenol	*47.6*			*10.0-155*
(S) p-Terphenyl-d14	*58.2*			*10.0-128*

Laboratory Control Sample (LCS)

(LCS) R4198300-1 04/10/25 23:19

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
1,4-Dichlorobenzene	0.500	0.311	62.2	18.0-120	
2,4-Dinitrotoluene	0.500	0.383	76.6	49.0-124	
Hexachlorobenzene	0.500	0.319	63.8	44.0-120	
Hexachloro-1,3-butadiene	0.500	0.327	65.4	19.0-120	
Hexachloroethane	0.500	0.348	69.6	15.0-120	
Nitrobenzene	0.500	0.364	72.8	27.0-120	
Pyridine	0.500	0.0773	15.5	10.0-120	
3&4-Methyl Phenol	0.500	0.294	58.8	31.0-120	
2-Methylphenol	0.500	0.273	54.6	28.0-120	
Pentachlorophenol	0.500	0.223	44.6	23.0-120	
2,4,5-Trichlorophenol	0.500	0.355	71.0	44.0-120	
2,4,6-Trichlorophenol	0.500	0.334	66.8	42.0-120	
(S) 2-Fluorophenol			*37.9*	*10.0-120*	
(S) Phenol-d5			*25.9*	*10.0-120*	
(S) Nitrobenzene-d5			*73.3*	*10.0-127*	

Laboratory Control Sample (LCS)

(LCS) R4198300-1 04/10/25 23:19

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 2-Fluorobiphenyl			*60.6*	*10.0-130*	
(S) 2,4,6-Tribromophenol			*61.0*	*10.0-155*	
(S) p-Terphenyl-d14			*68.8*	*10.0-128*	

L1843827-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1843827-05 04/11/25 00:23 • (MS) R4198300-3 04/11/25 00:44 • (MSD) R4198300-4 04/11/25 01:05

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,4-Dichlorobenzene	0.500	ND	0.248	0.239	49.6	47.8	1	17.0-120			3.70	40
2,4-Dinitrotoluene	0.500	ND	0.286	0.281	57.2	56.2	1	39.0-125			1.76	25
Hexachlorobenzene	0.500	ND	0.259	0.245	51.8	49.0	1	35.0-122			5.56	24
Hexachloro-1,3-butadiene	0.500	ND	0.255	0.233	51.0	46.6	1	12.0-120			9.02	34
Hexachloroethane	0.500	ND	0.271	0.245	54.2	49.0	1	10.0-120			10.1	40
Nitrobenzene	0.500	ND	0.292	0.279	58.4	55.8	1	12.0-120			4.55	30
Pyridine	0.500	ND	ND	ND	9.18	11.5	1	10.0-120	J6		22.3	37
3&4-Methyl Phenol	0.500	ND	0.224	0.179	44.8	35.8	1	10.0-120			22.3	36
2-Methylphenol	0.500	ND	0.212	0.174	42.4	34.8	1	10.0-120			19.7	30
Pentachlorophenol	0.500	ND	0.174	0.157	34.8	31.4	1	10.0-128			10.3	37
2,4,5-Trichlorophenol	0.500	ND	0.295	0.254	59.0	50.8	1	33.0-120			14.9	31
2,4,6-Trichlorophenol	0.500	ND	0.275	0.243	55.0	48.6	1	26.0-120			12.4	31
(S) 2-Fluorophenol					*29.1*	*23.8*		*10.0-120*				
(S) Phenol-d5					*20.3*	*19.1*		*10.0-120*				
(S) Nitrobenzene-d5					*59.4*	*56.9*		*10.0-127*				
(S) 2-Fluorobiphenyl					*49.1*	*44.6*		*10.0-130*				
(S) 2,4,6-Tribromophenol					*49.2*	*48.0*		*10.0-155*				
(S) p-Terphenyl-d14					*52.2*	*52.3*		*10.0-128*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
P	RPD between the primary and confirmatory analysis exceeded 40%.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660
Alaska	17-026
Arizona	AZ0612
Arkansas	88-0469
California	2932
Colorado	TN00003
Connecticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia [1]	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
Iowa	364
Kansas	E-10277
Kentucky [1 6]	KY90010
Kentucky [2]	16
Louisiana	AI30792
Louisiana	LA018
Maine	TN00003
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086
Nebraska	NE-OS-15-05
Nevada	TN000032021-1
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico [1]	TN00003
New York	11742
North Carolina	Env375
North Carolina [1]	DW21704
North Carolina [3]	41
North Dakota	R-140
Ohio–VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004002
South Dakota	n/a
Tennessee [1 4]	2006
Texas	T104704245-20-18
Texas [5]	LAB0152
Utah	TN000032021-11
Vermont	VT2006
Virginia	110033
Washington	C847
West Virginia	233
Wisconsin	998093910
Wyoming	A2LA

A2LA – ISO 17025	1461.01
A2LA – ISO 17025 [5]	1461.02
Canada	1461.01
EPA–Crypto	TN00003
AIHA-LAP,LLC EMLAP	100789
DOD	1461.01
USDA	P330-15-00234

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:

Civil & Environmental Consultants - PA

700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:

Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to: Laura Campbell 800-365-2324

Email To: lcampbell@cecinc.com

Project Description: Benwood Shredder Fluff

City/State Collected:

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project # ~~335-863~~ SAU 334-094

Lab Project # CECPPA-BENWOOD

SDG # L1843848

F046

Table #

Collected by (print): Sarah VanHorn

Site/Facility ID #

P.O. #

Acctnum: CECPPA

Template: T270505

Prelogin: P1139370

PM: 3564 - Chad A Upchurch

PB: 3/20/25 BK

Shipped Via: FedEX Ground

Collected by (signature):

Rush? (Lab MUST Be Notified)

___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day ___ STD TAT

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres	Remarks	Sample # (lab only)
SF-4	Comp	SS		3-31-25	1630	2	4 4/4/25		X		-01/02
SF-5	Comp	SS		4-1-25	1145	2	X	X3			-03/04
SF-6	Comp	SS		4-3-25	1600 RJ2 4/4	2					-05/06

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_________

Remarks:

pH _______ Temp _______

Flow _______ Other _______

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking # 443924458572

Sample Receipt Checklist
COC Seal Present/Intact: __NP [✓ Y] __N
COC Signed/Accurate: __Y [✓ N]
Bottles arrive intact: [✓ Y] __N
Correct bottles used: [✓ Y] __N
Sufficient volume sent: [✓ Y] __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: [✓ Y] __N

Relinquished by : (Signature)

Date: 4-3-25

Time: 1900

Received by: (Signature)

Trip Blank Received: [✓ Yes] / No 3
[✓ HCL] / MeoH
TBR

Relinquished by : (Signature)

Date:

Time:

Received by: (Signature)

Temp: TLA93.6+0.4=4.0 °C

Bottles Received: 12

If preservation required by Login: Date/Time

Relinquished by : (Signature)

Date:

Time:

Received for lab by: (Signature)

Date: 4/4/25

Time: 0915

Hold:

Condition: [✓ NCF] / OK

4/4 - NCF-L1843848 CECPPA

R5

Time estimate: 0h **Time spent:** 0h **Grouping date:** 8 April 2025

Members

Robert Rountree (responsible) CU Chad Upchurch

~~Due on *11 April 2025 5:00 PM* for target *Done*~~ (Was done by Robert Rountree at 8 April 2025 5:41 PM)

☑ Login Clarification needed
☐ Chain of custody is incomplete
☐ Custody seal not intact
☐ Please specify Metals requested
☐ Please specify TCLP requested
☐ Received additional samples not listed on COC
☐ Sample IDs on containers do not match IDs on COC
☐ Client did not "X" analysis
☐ Chain of Custody is missing
☐ If no COC: Received by:____________________
☐ If no COC: Date/Time:____________________
☐ If no COC: Temp./Cont.Rec./pH:________________
☐ If no COC: Carrier:________________
☐ If no COC: Tracking #:________________
☐ Client informed by call
☐ Client informed by Email
☐ Client informed by Voicemail
☐ Date/Time:____________________
☐ PM initials:__________________
☐ Client Contact:____________________

Comments

Robert Rountree *5 April 2025 12:46 AM*

This chain is set up with 2 lines for tclp tests and non tclp tests but client just used 3 lines for thier samples. Each set contains all the container from the prelog for the tclp and non-tclp lines. Can we confirm this is the proper set up before i add the tests?

Chad Upchurch *8 April 2025 8:16 AM*

Per client, please log all samples (SF-4, SF-5, SF-6) for:

TCLPEXT, TCLPZHE
M6010TCLP, V8260TCLP, SV8270TCLP
SV8082
DRORLA
GRO

Robert Rountree *8 April 2025 5:41 PM*

Tests added, done.

ANALYTICAL REPORT

May 14, 2025

Revised Report

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Civil & Environmental Consultants - PA

Sample Delivery Group:	L1846705
Samples Received:	04/11/2025
Project Number:	334-094
Description:	Benwood Shredder Fluff
Report To:	Laura Campbell 700 Cherrington Parkway Moon Township, PA 15108

Entire Report Reviewed By:

Chad A Upchurch
Project Manager

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

TABLE OF CONTENTS

SAMPLE SUMMARY

SF-7 L1846705-01

Collected by	Collected date/time	Received date/time
Hannah Enderloy	04/08/25 16:05	04/11/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG2489152	1	04/14/25 08:38	04/14/25 08:38	CCY	Mt. Juliet, TN
Preparation by Method 1311	WG2489213	1	04/14/25 09:36	04/14/25 09:36	BTP	Mt. Juliet, TN
Mercury by Method 7470A	WG2490848	1	04/15/25 10:16	04/17/25 20:35	LAS	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2490948	1	04/15/25 13:28	04/16/25 23:20	MAP	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2490764	1	04/17/25 17:14	04/17/25 17:14	ACG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG2493811	1	04/18/25 09:03	04/19/25 19:55	HLA	Mt. Juliet, TN

SF-7 L1846705-02

Collected by	Collected date/time	Received date/time
Hannah Enderloy	04/08/25 16:05	04/11/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2509891	1	05/08/25 09:21	05/08/25 09:30	CMB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2495474	25	04/08/25 16:05	04/20/25 12:03	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG2492146	1400	04/17/25 06:55	04/17/25 15:43	KDB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2490193	13.6	04/16/25 10:36	04/17/25 03:54	LTB	Mt. Juliet, TN

SF-8 L1846705-03

Collected by	Collected date/time	Received date/time
Hannah Enderloy	04/09/25 16:00	04/11/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG2489164	1	04/16/25 10:49	04/16/25 10:49	PNK	Mt. Juliet, TN
Preparation by Method 1311	WG2489213	1	04/14/25 09:36	04/14/25 09:36	BTP	Mt. Juliet, TN
Mercury by Method 7470A	WG2493165	1	04/17/25 12:18	04/18/25 17:38	LAS	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2493733	1	04/18/25 04:42	04/19/25 09:32	RLS	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2490764	1	04/17/25 17:38	04/17/25 17:38	ACG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG2493811	1	04/18/25 09:03	04/19/25 20:17	HLA	Mt. Juliet, TN

SF-8 L1846705-04

Collected by	Collected date/time	Received date/time
Hannah Enderloy	04/09/25 16:00	04/11/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2509891	1	05/08/25 09:21	05/08/25 09:30	CMB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2495474	25	04/09/25 16:00	04/20/25 12:24	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG2492146	1500	04/17/25 06:55	04/17/25 15:57	KDB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2490193	15	04/16/25 10:36	04/17/25 04:04	MEW	Mt. Juliet, TN

SF-9 L1846705-05

Collected by	Collected date/time	Received date/time
Hannah Enderloy	04/10/25 16:10	04/11/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG2489164	1	04/16/25 10:49	04/16/25 10:49	PNK	Mt. Juliet, TN
Preparation by Method 1311	WG2489213	1	04/14/25 09:36	04/14/25 09:36	BTP	Mt. Juliet, TN
Mercury by Method 7470A	WG2493165	1	04/17/25 12:18	04/18/25 17:41	LAS	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2493733	1	04/18/25 04:42	04/19/25 09:34	RLS	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2490764	1	04/17/25 18:01	04/17/25 18:01	ACG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG2493811	1	04/18/25 09:03	04/19/25 20:40	HLA	Mt. Juliet, TN

SAMPLE SUMMARY

	Collected by	Collected date/time	Received date/time
SF-9 L1846705-06	Hannah Enderloy	04/10/25 16:10	04/11/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2509892	1	05/08/25 09:06	05/08/25 09:20	CMB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2495474	50	04/10/25 16:10	04/20/25 12:44	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG2492146	1430	04/17/25 06:55	04/17/25 16:11	KDB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2490193	13.5	04/16/25 10:36	04/17/25 04:25	LTB	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chad A Upchurch
Project Manager

Report Revision History

Level II Report - Version 1: 04/21/25 17:03

Project Narrative

L1846705-02, L1846705-04, L1846705-06: Reported on a dry weight corrected basis, per request.

Preparation by Method 1311

	Result	Qualifier	Prep	Batch
Analyte			date / time	
TCLP Extraction	-		4/14/2025 8:38:57 AM	WG2489152
TCLP ZHE Extraction	-		4/14/2025 9:36:15 AM	WG2489213
Initial pH	8.73		4/14/2025 8:38:57 AM	WG2489152
Final pH	6.00		4/14/2025 8:38:57 AM	WG2489152

Mercury by Method 7470A

	Result	Qualifier	RDL	Limit	Dilution	Analysis	Batch
Analyte	mg/l		mg/l	mg/l		date / time	
Mercury	ND		0.0100	0.20	1	04/17/2025 20:35	WG2490848

Metals (ICP) by Method 6010D

	Result	Qualifier	RDL	Limit	Dilution	Analysis	Batch
Analyte	mg/l		mg/l	mg/l		date / time	
Arsenic	ND		0.100	5	1	04/16/2025 23:20	WG2490948
Barium	0.848		0.100	100	1	04/16/2025 23:20	WG2490948
Cadmium	0.361		0.100	1	1	04/16/2025 23:20	WG2490948
Chromium	ND		0.100	5	1	04/16/2025 23:20	WG2490948
Lead	1.19		0.100	5	1	04/16/2025 23:20	WG2490948
Selenium	ND		0.100	1	1	04/16/2025 23:20	WG2490948
Silver	ND		0.100	5	1	04/16/2025 23:20	WG2490948

Volatile Organic Compounds (GC/MS) by Method 8260B

	Result	Qualifier	RDL	Limit	Dilution	Analysis	Batch
Analyte	mg/l		mg/l	mg/l		date / time	
Benzene	ND		0.0500	0.50	1	04/17/2025 17:14	WG2490764
Carbon tetrachloride	ND		0.0500	0.50	1	04/17/2025 17:14	WG2490764
Chlorobenzene	ND		0.0500	100	1	04/17/2025 17:14	WG2490764
Chloroform	ND		0.250	6	1	04/17/2025 17:14	WG2490764
1,2-Dichloroethane	ND		0.0500	0.50	1	04/17/2025 17:14	WG2490764
1,1-Dichloroethene	ND		0.0500	0.70	1	04/17/2025 17:14	WG2490764
2-Butanone (MEK)	ND	J3	0.500	200	1	04/17/2025 17:14	WG2490764
Tetrachloroethene	ND		0.0500	0.70	1	04/17/2025 17:14	WG2490764
Trichloroethene	ND	J3	0.0500	0.50	1	04/17/2025 17:14	WG2490764
Vinyl chloride	ND		0.0500	0.20	1	04/17/2025 17:14	WG2490764
(S) Toluene-d8	*108*		*80.0-120*			*04/17/2025 17:14*	WG2490764
(S) 4-Bromofluorobenzene	*100*		*77.0-126*			*04/17/2025 17:14*	WG2490764
(S) 1,2-Dichloroethane-d4	*99.9*		*70.0-130*			*04/17/2025 17:14*	WG2490764

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

	Result	Qualifier	RDL	Limit	Dilution	Analysis	Batch
Analyte	mg/l		mg/l	mg/l		date / time	
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/19/2025 19:55	WG2493811
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/19/2025 19:55	WG2493811
Hexachlorobenzene	ND		0.100	0.13	1	04/19/2025 19:55	WG2493811
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/19/2025 19:55	WG2493811
Hexachloroethane	ND		0.100	3	1	04/19/2025 19:55	WG2493811
Nitrobenzene	ND		0.100	2	1	04/19/2025 19:55	WG2493811
Pyridine	ND		0.100	5	1	04/19/2025 19:55	WG2493811
3&4-Methyl Phenol	ND		0.100	400	1	04/19/2025 19:55	WG2493811
2-Methylphenol	ND		0.100	200	1	04/19/2025 19:55	WG2493811
Pentachlorophenol	ND		0.100	100	1	04/19/2025 19:55	WG2493811
2,4,5-Trichlorophenol	ND		0.100	400	1	04/19/2025 19:55	WG2493811
2,4,6-Trichlorophenol	ND		0.100	2	1	04/19/2025 19:55	WG2493811
(S) 2-Fluorophenol	*30.3*		*10.0-120*			*04/19/2025 19:55*	WG2493811

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
(S) Phenol-d5	*21.8*		*10.0-120*			*04/19/2025 19:55*	WG2493811
(S) Nitrobenzene-d5	*55.6*		*10.0-127*			*04/19/2025 19:55*	WG2493811
(S) 2-Fluorobiphenyl	*54.5*		*10.0-130*			*04/19/2025 19:55*	WG2493811
(S) 2,4,6-Tribromophenol	*70.5*		*10.0-155*			*04/19/2025 19:55*	WG2493811
(S) p-Terphenyl-d14	*63.4*		*10.0-128*			*04/19/2025 19:55*	WG2493811

SAMPLE RESULTS - 02

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	77.9		1	05/08/2025 09:30	WG2509891

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	37.3		4.99	25	04/20/2025 12:03	WG2495474
(S) a,a,a-Trifluorotoluene(FID)	*99.5*		*77.0-120*		*04/20/2025 12:03*	WG2495474

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	13000		7190	1400	04/17/2025 15:43	WG2492146
C28-C40 Oil Range	20300		7190	1400	04/17/2025 15:43	WG2492146
(S) o-Terphenyl	*0.000*	J7	*18.0-148*		*04/17/2025 15:43*	WG2492146

Polychlorinated Biphenyls (GC) by Method 8082 A

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.593	13.6	04/17/2025 03:54	WG2490193
PCB 1221	ND		0.593	13.6	04/17/2025 03:54	WG2490193
PCB 1232	ND		0.593	13.6	04/17/2025 03:54	WG2490193
PCB 1242	9.77		0.593	13.6	04/17/2025 03:54	WG2490193
PCB 1248	ND		0.296	13.6	04/17/2025 03:54	WG2490193
PCB 1254	ND		0.296	13.6	04/17/2025 03:54	WG2490193
PCB 1260	1.49		0.296	13.6	04/17/2025 03:54	WG2490193
(S) Decachlorobiphenyl	*79.0*		*10.0-135*		*04/17/2025 03:54*	WG2490193
(S) Tetrachloro-m-xylene	*72.6*		*10.0-139*		*04/17/2025 03:54*	WG2490193

Sample Narrative:

L1846705-02 WG2490193: Dilution due to matrix impact during extraction procedure

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/16/2025 10:49:50 AM	WG2489164
TCLP ZHE Extraction	-		4/14/2025 9:36:15 AM	WG2489213
Initial pH	6.87		4/16/2025 10:49:50 AM	WG2489164
Final pH	4.91		4/16/2025 10:49:50 AM	WG2489164

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/18/2025 17:38	WG2493165

Metals (ICP) by Method 6010D

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	04/19/2025 09:32	WG2493733
Barium	0.798		0.100	100	1	04/19/2025 09:32	WG2493733
Cadmium	0.206		0.100	1	1	04/19/2025 09:32	WG2493733
Chromium	ND		0.100	5	1	04/19/2025 09:32	WG2493733
Lead	0.438		0.100	5	1	04/19/2025 09:32	WG2493733
Selenium	ND		0.100	1	1	04/19/2025 09:32	WG2493733
Silver	ND		0.100	5	1	04/19/2025 09:32	WG2493733

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/17/2025 17:38	WG2490764
Carbon tetrachloride	ND		0.0500	0.50	1	04/17/2025 17:38	WG2490764
Chlorobenzene	ND		0.0500	100	1	04/17/2025 17:38	WG2490764
Chloroform	ND		0.250	6	1	04/17/2025 17:38	WG2490764
1,2-Dichloroethane	ND		0.0500	0.50	1	04/17/2025 17:38	WG2490764
1,1-Dichloroethene	ND		0.0500	0.70	1	04/17/2025 17:38	WG2490764
2-Butanone (MEK)	ND	J3	0.500	200	1	04/17/2025 17:38	WG2490764
Tetrachloroethene	ND		0.0500	0.70	1	04/17/2025 17:38	WG2490764
Trichloroethene	ND	J3	0.0500	0.50	1	04/17/2025 17:38	WG2490764
Vinyl chloride	ND		0.0500	0.20	1	04/17/2025 17:38	WG2490764
(S) Toluene-d8	*108*		*80.0-120*			*04/17/2025 17:38*	WG2490764
(S) 4-Bromofluorobenzene	*97.7*		*77.0-126*			*04/17/2025 17:38*	WG2490764
(S) 1,2-Dichloroethane-d4	*103*		*70.0-130*			*04/17/2025 17:38*	WG2490764

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/19/2025 20:17	WG2493811
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/19/2025 20:17	WG2493811
Hexachlorobenzene	ND		0.100	0.13	1	04/19/2025 20:17	WG2493811
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/19/2025 20:17	WG2493811
Hexachloroethane	ND		0.100	3	1	04/19/2025 20:17	WG2493811
Nitrobenzene	ND		0.100	2	1	04/19/2025 20:17	WG2493811
Pyridine	ND		0.100	5	1	04/19/2025 20:17	WG2493811
3&4-Methyl Phenol	ND		0.100	400	1	04/19/2025 20:17	WG2493811
2-Methylphenol	ND		0.100	200	1	04/19/2025 20:17	WG2493811
Pentachlorophenol	ND		0.100	100	1	04/19/2025 20:17	WG2493811
2,4,5-Trichlorophenol	ND		0.100	400	1	04/19/2025 20:17	WG2493811
2,4,6-Trichlorophenol	ND		0.100	2	1	04/19/2025 20:17	WG2493811
(S) 2-Fluorophenol	*30.1*		*10.0-120*			*04/19/2025 20:17*	WG2493811

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
(S) Phenol-d5	*23.1*		*10.0-120*			*04/19/2025 20:17*	WG2493811
(S) Nitrobenzene-d5	*58.2*		*10.0-127*			*04/19/2025 20:17*	WG2493811
(S) 2-Fluorobiphenyl	*59.3*		*10.0-130*			*04/19/2025 20:17*	WG2493811
(S) 2,4,6-Tribromophenol	*58.5*		*10.0-155*			*04/19/2025 20:17*	WG2493811
(S) p-Terphenyl-d14	*68.6*		*10.0-128*			*04/19/2025 20:17*	WG2493811

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	79.2		1	05/08/2025 09:30	WG2509891

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	43.3		4.72	25	04/20/2025 12:24	WG2495474
(S) a,a,a-Trifluorotoluene(FID)	*96.3*		*77.0-120*		*04/20/2025 12:24*	WG2495474

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	15700		7580	1500	04/17/2025 15:57	WG2492146
C28-C40 Oil Range	23400		7580	1500	04/17/2025 15:57	WG2492146
(S) o-Terphenyl	*0.000*	J7	*18.0-148*		*04/17/2025 15:57*	WG2492146

Polychlorinated Biphenyls (GC) by Method 8082 A

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.644	15	04/17/2025 04:04	WG2490193
PCB 1221	ND		0.644	15	04/17/2025 04:04	WG2490193
PCB 1232	ND		0.644	15	04/17/2025 04:04	WG2490193
PCB 1242	7.98		0.644	15	04/17/2025 04:04	WG2490193
PCB 1248	ND		0.322	15	04/17/2025 04:04	WG2490193
PCB 1254	1.07		0.322	15	04/17/2025 04:04	WG2490193
PCB 1260	ND		0.322	15	04/17/2025 04:04	WG2490193
(S) Decachlorobiphenyl	*72.5*		*10.0-135*		*04/17/2025 04:04*	WG2490193
(S) Tetrachloro-m-xylene	*62.6*		*10.0-139*		*04/17/2025 04:04*	WG2490193

Sample Narrative:

L1846705-04 WG2490193: Dilution due to matrix impact during extraction procedure

SF-9

Collected date/time: 04/10/25 16:10

SAMPLE RESULTS - 05

L1846705

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/16/2025 10:49:50 AM	WG2489164
TCLP ZHE Extraction	-		4/14/2025 9:36:15 AM	WG2489213
Initial pH	7.15		4/16/2025 10:49:50 AM	WG2489164
Final pH	5.33		4/16/2025 10:49:50 AM	WG2489164

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/18/2025 17:41	WG2493165

Metals (ICP) by Method 6010D

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	04/19/2025 09:34	WG2493733
Barium	0.857		0.100	100	1	04/19/2025 09:34	WG2493733
Cadmium	0.195		0.100	1	1	04/19/2025 09:34	WG2493733
Chromium	ND		0.100	5	1	04/19/2025 09:34	WG2493733
Lead	3.58		0.100	5	1	04/19/2025 09:34	WG2493733
Selenium	ND		0.100	1	1	04/19/2025 09:34	WG2493733
Silver	ND		0.100	5	1	04/19/2025 09:34	WG2493733

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/17/2025 18:01	WG2490764
Carbon tetrachloride	ND		0.0500	0.50	1	04/17/2025 18:01	WG2490764
Chlorobenzene	ND		0.0500	100	1	04/17/2025 18:01	WG2490764
Chloroform	ND		0.250	6	1	04/17/2025 18:01	WG2490764
1,2-Dichloroethane	ND		0.0500	0.50	1	04/17/2025 18:01	WG2490764
1,1-Dichloroethene	ND		0.0500	0.70	1	04/17/2025 18:01	WG2490764
2-Butanone (MEK)	ND	J3	0.500	200	1	04/17/2025 18:01	WG2490764
Tetrachloroethene	ND		0.0500	0.70	1	04/17/2025 18:01	WG2490764
Trichloroethene	ND	J3	0.0500	0.50	1	04/17/2025 18:01	WG2490764
Vinyl chloride	ND		0.0500	0.20	1	04/17/2025 18:01	WG2490764
(S) Toluene-d8	*113*		*80.0-120*			*04/17/2025 18:01*	WG2490764
(S) 4-Bromofluorobenzene	*102*		*77.0-126*			*04/17/2025 18:01*	WG2490764
(S) 1,2-Dichloroethane-d4	*102*		*70.0-130*			*04/17/2025 18:01*	WG2490764

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/19/2025 20:40	WG2493811
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/19/2025 20:40	WG2493811
Hexachlorobenzene	ND		0.100	0.13	1	04/19/2025 20:40	WG2493811
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/19/2025 20:40	WG2493811
Hexachloroethane	ND		0.100	3	1	04/19/2025 20:40	WG2493811
Nitrobenzene	ND		0.100	2	1	04/19/2025 20:40	WG2493811
Pyridine	ND		0.100	5	1	04/19/2025 20:40	WG2493811
3&4-Methyl Phenol	ND		0.100	400	1	04/19/2025 20:40	WG2493811
2-Methylphenol	ND		0.100	200	1	04/19/2025 20:40	WG2493811
Pentachlorophenol	ND		0.100	100	1	04/19/2025 20:40	WG2493811
2,4,5-Trichlorophenol	ND		0.100	400	1	04/19/2025 20:40	WG2493811
2,4,6-Trichlorophenol	ND		0.100	2	1	04/19/2025 20:40	WG2493811
(S) 2-Fluorophenol	*26.3*		*10.0-120*			*04/19/2025 20:40*	WG2493811

SF-9

Collected date/time: 04/10/25 16:10

SAMPLE RESULTS - 05

L1846705

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
(S) Phenol-d5	*19.1*		*10.0-120*			*04/19/2025 20:40*	WG2493811
(S) Nitrobenzene-d5	*49.9*		*10.0-127*			*04/19/2025 20:40*	WG2493811
(S) 2-Fluorobiphenyl	*50.3*		*10.0-130*			*04/19/2025 20:40*	WG2493811
(S) 2,4,6-Tribromophenol	*59.0*		*10.0-155*			*04/19/2025 20:40*	WG2493811
(S) p-Terphenyl-d14	*69.8*		*10.0-128*			*04/19/2025 20:40*	WG2493811

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

SF-9

Collected date/time: 04/10/25 16:10

SAMPLE RESULTS - 06

L1846705

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	77.5		1	05/08/2025 09:20	WG2509892

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	34.4		9.82	50	04/20/2025 12:44	WG2495474
(S) a,a,a-Trifluorotoluene(FID)	*103*		*77.0-120*		*04/20/2025 12:44*	WG2495474

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	14600		7380	1430	04/17/2025 16:11	WG2492146
C28-C40 Oil Range	22600		7380	1430	04/17/2025 16:11	WG2492146
(S) o-Terphenyl	*0.000*	J7	*18.0-148*		*04/17/2025 16:11*	WG2492146

Polychlorinated Biphenyls (GC) by Method 8082 A

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.592	13.5	04/17/2025 04:25	WG2490193
PCB 1221	ND		0.592	13.5	04/17/2025 04:25	WG2490193
PCB 1232	ND		0.592	13.5	04/17/2025 04:25	WG2490193
PCB 1242	6.82		0.592	13.5	04/17/2025 04:25	WG2490193
PCB 1248	ND		0.297	13.5	04/17/2025 04:25	WG2490193
PCB 1254	ND		0.297	13.5	04/17/2025 04:25	WG2490193
PCB 1260	ND		0.297	13.5	04/17/2025 04:25	WG2490193
(S) Decachlorobiphenyl	*89.1*		*10.0-135*		*04/17/2025 04:25*	WG2490193
(S) Tetrachloro-m-xylene	*69.9*		*10.0-139*		*04/17/2025 04:25*	WG2490193

Sample Narrative:

L1846705-06 WG2490193: Dilution due to matrix impact during extraction procedure

Method Blank (MB)

(MB) R4212182-1 05/08/25 09:30

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00200			

L1854025-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1854025-07 05/08/25 09:30 • (DUP) R4212182-3 05/08/25 09:30

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	77.2	76.4	1	0.973		10

Laboratory Control Sample (LCS)

(LCS) R4212182-2 05/08/25 09:30

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	90.0-110	

Method Blank (MB)

(MB) R4212181-1 05/08/25 09:20

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00100			

L1852366-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1852366-01 05/08/25 09:20 • (DUP) R4212181-3 05/08/25 09:20

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	89.3	88.7	1	0.681		10

Laboratory Control Sample (LCS)

(LCS) R4212181-2 05/08/25 09:20

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	90.0-110	

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R4201489-1 04/17/25 19:21

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.00333	0.0100

Laboratory Control Sample (LCS)

(LCS) R4201489-2 04/17/25 19:24

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.0300	0.0287	95.7	80.0-120	

L1846679-14 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1846679-14 04/17/25 19:32 • (MS) R4201489-4 04/17/25 19:37 • (MSD) R4201489-5 04/17/25 19:39

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0285	0.0289	94.9	96.3	1	75.0-125			1.43	20

WG2493165

Mercury by Method 7470A

QUALITY CONTROL SUMMARY

L1846705-03,05

Method Blank (MB)

(MB) R4201874-1 04/18/25 17:08

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.00333	0.0100

Laboratory Control Sample (LCS)

(LCS) R4201874-2 04/18/25 17:10

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.0300	0.0326	109	80.0-120	

L1847779-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1847779-02 04/18/25 17:28 • (MS) R4201874-4 04/18/25 17:33 • (MSD) R4201874-5 04/18/25 17:35

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0319	0.0324	106	108	1	75.0-125			1.43	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4200769-1 04/16/25 22:06

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Arsenic	U		0.0333	0.100
Barium	U		0.0333	0.100
Cadmium	U		0.0333	0.100
Chromium	U		0.0333	0.100
Lead	U		0.0333	0.100
Selenium	U		0.0333	0.100
Silver	U		0.0333	0.100

Laboratory Control Sample (LCS)

(LCS) R4200769-2 04/16/25 22:08

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/l	mg/l	%	%	
Arsenic	10.0	9.81	98.1	80.0-120	
Barium	10.0	10.3	103	80.0-120	
Cadmium	10.0	9.70	97.0	80.0-120	
Chromium	10.0	9.98	99.8	80.0-120	
Lead	10.0	9.40	94.0	80.0-120	
Selenium	10.0	9.42	94.2	80.0-120	
Silver	2.00	2.00	99.8	80.0-120	

L1846583-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1846583-04 04/16/25 22:11 • (MS) R4200769-4 04/16/25 22:17 • (MSD) R4200769-5 04/16/25 22:19

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Arsenic	10.0	ND	9.94	9.97	99.4	99.7	1	75.0-125			0.273	20
Barium	10.0	5.12	15.0	15.0	99.1	98.5	1	75.0-125			0.382	20
Cadmium	10.0	ND	9.81	9.79	98.1	97.9	1	75.0-125			0.167	20
Chromium	10.0	ND	10.1	10.1	101	101	1	75.0-125			0.0729	20
Lead	10.0	ND	9.50	9.50	95.0	95.0	1	75.0-125			0.0461	20
Selenium	10.0	ND	9.63	9.63	96.3	96.3	1	75.0-125			0.0684	20
Silver	2.00	ND	2.01	2.04	101	102	1	75.0-125			1.07	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4202072-1 04/19/25 09:22

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.0333	0.100
Barium	U		0.0333	0.100
Cadmium	U		0.0333	0.100
Chromium	U		0.0333	0.100
Lead	U		0.0333	0.100
Selenium	U		0.0333	0.100
Silver	U		0.0333	0.100

Laboratory Control Sample (LCS)

(LCS) R4202072-2 04/19/25 09:24

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	10.0	10.2	102	80.0-120	
Barium	10.0	10.3	103	80.0-120	
Cadmium	10.0	10.0	100	80.0-120	
Chromium	10.0	10.4	104	80.0-120	
Lead	10.0	10.0	100	80.0-120	
Selenium	10.0	10.1	101	80.0-120	
Silver	2.00	2.10	105	80.0-120	

L1846884-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1846884-02 04/19/25 09:26 • (MS) R4202072-4 04/19/25 09:29 • (MSD) R4202072-5 04/19/25 09:31

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	9.72	9.96	96.7	99.1	1	75.0-125			2.45	20
Barium	10.0	2.59	12.4	12.4	98.2	98.5	1	75.0-125			0.289	20
Cadmium	10.0	ND	9.57	9.78	95.7	97.8	1	75.0-125			2.19	20
Chromium	10.0	ND	9.90	10.1	99.0	101	1	75.0-125			2.46	20
Lead	10.0	0.109	9.69	9.79	95.8	96.8	1	75.0-125			1.00	20
Selenium	10.0	ND	9.58	9.78	95.3	97.3	1	75.0-125			2.06	20
Silver	2.00	ND	2.02	2.04	101	102	1	75.0-125			0.938	20

Method Blank (MB)

(MB) R4202587-2 04/20/25 11:07

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	*103*			*77.0-120*

Laboratory Control Sample (LCS)

(LCS) R4202587-1 04/20/25 10:07

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.00	5.31	106	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*106*	*77.0-120*	

QUALITY CONTROL SUMMARY

Method Blank (MB)

(MB) R4201201-3 04/17/25 13:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0167	0.0500
Carbon tetrachloride	U		0.0167	0.0500
Chlorobenzene	U		0.0167	0.0500
Chloroform	U		0.0833	0.250
1,2-Dichloroethane	U		0.0167	0.0500
1,1-Dichloroethene	U		0.0167	0.0500
2-Butanone (MEK)	U		0.167	0.500
Tetrachloroethene	U		0.0167	0.0500
Trichloroethene	U		0.0167	0.0500
Vinyl chloride	U		0.0167	0.0500
(S) Toluene-d8	*109*			*80.0-120*
(S) 4-Bromofluorobenzene	*96.2*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*99.9*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R4201201-1 04/17/25 09:52 • (LCSD) R4201201-2 04/17/25 12:14

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.250	0.258	0.231	103	92.4	70.0-123			11.0	20
Carbon tetrachloride	0.250	0.244	0.215	97.6	86.0	68.0-126			12.6	20
Chlorobenzene	0.250	0.258	0.235	103	94.0	80.0-121			9.33	20
Chloroform	0.250	0.254	0.234	102	93.6	73.0-120			8.20	20
1,2-Dichloroethane	0.250	0.249	0.220	99.6	88.0	70.0-128			12.4	20
1,1-Dichloroethene	0.250	0.262	0.226	105	90.4	71.0-124			14.8	20
2-Butanone (MEK)	1.25	1.17	0.906	93.6	72.5	44.0-160		J3	25.4	20
Tetrachloroethene	0.250	0.263	0.226	105	90.4	72.0-132			15.1	20
Trichloroethene	0.250	0.252	0.197	101	78.8	78.0-124		J3	24.5	20
Vinyl chloride	0.250	0.323	0.274	129	110	67.0-131			16.4	20
(S) Toluene-d8				*107*	*107*	*80.0-120*				
(S) 4-Bromofluorobenzene				*102*	*103*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*94.4*	*98.1*	*70.0-130*				

L1845499-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1845499-02 04/17/25 14:53 • (MS) R4201201-4 04/17/25 21:09 • (MSD) R4201201-5 04/17/25 21:33

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Benzene	0.250	ND	0.204	0.189	81.6	75.6	1	17.0-158			7.63	27
Carbon tetrachloride	0.250	ND	0.191	0.189	76.4	75.6	1	23.0-159			1.05	28
Chlorobenzene	0.250	ND	0.212	0.204	84.8	81.6	1	33.0-152			3.85	27
Chloroform	0.250	ND	ND	ND	86.4	82.8	1	29.0-154			4.26	28
1,2-Dichloroethane	0.250	ND	0.202	0.203	80.8	81.2	1	29.0-151			0.494	27
1,1-Dichloroethene	0.250	ND	0.169	0.158	67.6	63.2	1	11.0-160			6.73	29
2-Butanone (MEK)	1.25	ND	0.810	0.760	64.8	60.8	1	10.0-160			6.37	32
Tetrachloroethene	0.250	ND	0.186	0.182	74.4	72.8	1	10.0-160			2.17	27
Trichloroethene	0.250	ND	0.166	0.168	66.4	67.2	1	10.0-160			1.20	25
Vinyl chloride	0.250	ND	0.176	0.170	70.4	68.0	1	10.0-160			3.47	27
(S) Toluene-d8					*108*	*106*		*80.0-120*				
(S) 4-Bromofluorobenzene					*99.6*	*99.9*		*77.0-126*				
(S) 1,2-Dichloroethane-d4					*97.4*	*96.4*		*70.0-130*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4201234-1 04/17/25 10:57

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	*60.8*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R4201234-2 04/17/25 11:16

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	37.7	75.4	50.0-150	
(S) o-Terphenyl			*74.8*	*18.0-148*	

L1846983-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1846983-01 04/17/25 13:22 • (MS) R4201234-3 04/17/25 13:36 • (MSD) R4201234-4 04/17/25 13:50

Analyte	Spike Amount (dry) mg/kg	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	54.7	ND	32.2	34.8	59.0	63.6	1	50.0-150			7.73	20
(S) o-Terphenyl					*57.9*	*65.1*		*18.0-148*				

QUALITY CONTROL SUMMARY

L1846705-02,04,06

Method Blank (MB)

(MB) R4200871-1 04/17/25 01:01

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.0102	0.0340
PCB 1221	U		0.0107	0.0340
PCB 1232	U		0.0182	0.0340
PCB 1242	U		0.0101	0.0340
PCB 1248	U		0.0124	0.0170
PCB 1254	U		0.0104	0.0170
PCB 1260	U		0.0110	0.0170
(S) Decachlorobiphenyl	*97.3*			*10.0-135*
(S) Tetrachloro-m-xylene	*89.8*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R4200871-2 04/17/25 01:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1016	0.167	0.0767	45.9	36.0-141	
PCB 1260	0.167	0.0777	46.5	37.0-145	
(S) Decachlorobiphenyl			*58.7*	*10.0-135*	
(S) Tetrachloro-m-xylene			*52.9*	*10.0-139*	

L1846167-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1846167-09 04/17/25 01:21 • (MS) R4200871-3 04/17/25 01:32 • (MSD) R4200871-4 04/17/25 01:42

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1016	0.187	ND	0.154	0.148	82.2	80.1	1	10.0-160			3.80	37
PCB 1260	0.187	ND	0.162	0.153	86.5	82.6	1	10.0-160			5.84	38
(S) Decachlorobiphenyl					*85.9*	*83.5*		*10.0-135*				
(S) Tetrachloro-m-xylene					*77.0*	*77.6*		*10.0-139*				

Method Blank (MB)

(MB) R4202331-2 04/19/25 12:06

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
1,4-Dichlorobenzene	U		0.0333	0.100
2,4-Dinitrotoluene	U		0.0333	0.100
Hexachlorobenzene	U		0.0333	0.100
Hexachloro-1,3-butadiene	U		0.0333	0.100
Hexachloroethane	U		0.0333	0.100
Nitrobenzene	U		0.0333	0.100
Pyridine	U		0.0333	0.100
3&4-Methyl Phenol	U		0.0333	0.100
2-Methylphenol	U		0.0333	0.100
Pentachlorophenol	U		0.0333	0.100
2,4,5-Trichlorophenol	U		0.0333	0.100
2,4,6-Trichlorophenol	U		0.0333	0.100
(S) 2-Fluorophenol	*27.4*			*10.0-120*
(S) Phenol-d5	*19.8*			*10.0-120*
(S) Nitrobenzene-d5	*52.6*			*10.0-127*
(S) 2-Fluorobiphenyl	*53.8*			*10.0-130*
(S) 2,4,6-Tribromophenol	*53.0*			*10.0-155*
(S) p-Terphenyl-d14	*65.6*			*10.0-128*

Laboratory Control Sample (LCS)

(LCS) R4202331-1 04/19/25 11:44

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
1,4-Dichlorobenzene	0.500	0.295	59.0	18.0-120	
2,4-Dinitrotoluene	0.500	0.401	80.2	49.0-124	
Hexachlorobenzene	0.500	0.300	60.0	44.0-120	
Hexachloro-1,3-butadiene	0.500	0.237	47.4	19.0-120	
Hexachloroethane	0.500	0.298	59.6	15.0-120	
Nitrobenzene	0.500	0.273	54.6	27.0-120	
Pyridine	0.500	0.151	30.2	10.0-120	
3&4-Methyl Phenol	0.500	0.234	46.8	31.0-120	
2-Methylphenol	0.500	0.221	44.2	28.0-120	
Pentachlorophenol	0.500	0.304	60.8	23.0-120	
2,4,5-Trichlorophenol	0.500	0.350	70.0	44.0-120	
2,4,6-Trichlorophenol	0.500	0.330	66.0	42.0-120	
(S) 2-Fluorophenol			*30.5*	*10.0-120*	
(S) Phenol-d5			*20.9*	*10.0-120*	
(S) Nitrobenzene-d5			*46.2*	*10.0-127*	

Laboratory Control Sample (LCS)

(LCS) R4202331-1 04/19/25 11:44

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 2-Fluorobiphenyl			*56.8*	*10.0-130*	
(S) 2,4,6-Tribromophenol			*72.0*	*10.0-155*	
(S) p-Terphenyl-d14			*63.6*	*10.0-128*	

L1833166-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1833166-02 04/19/25 16:12 • (MS) R4202331-3 04/19/25 16:34 • (MSD) R4202331-4 04/19/25 16:57

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,4-Dichlorobenzene	0.500	ND	0.230	0.225	46.0	45.0	1	17.0-120			2.20	40
2,4-Dinitrotoluene	0.500	ND	0.362	0.348	72.4	69.6	1	39.0-125			3.94	25
Hexachlorobenzene	0.500	ND	0.267	0.250	53.4	50.0	1	35.0-122			6.58	24
Hexachloro-1,3-butadiene	0.500	ND	0.181	0.180	36.2	36.0	1	12.0-120			0.554	34
Hexachloroethane	0.500	ND	0.225	0.222	45.0	44.4	1	10.0-120			1.34	40
Nitrobenzene	0.500	ND	0.216	0.219	43.2	43.8	1	12.0-120			1.38	30
Pyridine	0.500	ND	0.181	0.141	36.2	28.2	1	10.0-120			24.8	37
3&4-Methyl Phenol	0.500	ND	0.198	0.203	39.6	40.6	1	10.0-120			2.49	36
2-Methylphenol	0.500	ND	0.178	0.182	35.6	36.4	1	10.0-120			2.22	30
Pentachlorophenol	0.500	ND	0.260	0.275	52.0	55.0	1	10.0-128			5.61	37
2,4,5-Trichlorophenol	0.500	ND	0.295	0.286	59.0	57.2	1	33.0-120			3.10	31
2,4,6-Trichlorophenol	0.500	ND	0.270	0.267	54.0	53.4	1	26.0-120			1.12	31
(S) 2-Fluorophenol					*24.6*	*24.7*		*10.0-120*				
(S) Phenol-d5					*17.9*	*18.6*		*10.0-120*				
(S) Nitrobenzene-d5					*40.2*	*39.2*		*10.0-127*				
(S) 2-Fluorobiphenyl					*47.8*	*45.7*		*10.0-130*				
(S) 2,4,6-Tribromophenol					*63.5*	*63.5*		*10.0-155*				
(S) p-Terphenyl-d14					*58.7*	*61.3*		*10.0-128*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1,6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1,4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address: **Civil & Environmental Consultants - PA** 700 Cherrington Parkway Moon Township, PA 15108	Billing Information: **Accounts Payable** **700 Cherrington Parkway** **Moon Township, PA 15108**	Pres Chk
Report to: **Laura Campbell 800-365-2324**	Email To: **lcampbell@cecinc.com**	
Project Description: **Benwood Shredder Fluff**	City/State Collected:	Please Circle: PT MT CT ET
Regulatory Program(DOD,RCRA,DW,etc):	Client Project # HRE ~~335-863~~ 334-094	Lab Project # **CECPPA-BENWOOD**
Collected by (print): Hannah Enderby	Site/Facility ID #	P.O. #
Collected by (signature): Immediately Packed on Ice N ____ Y X	*Rush?* (Lab MUST Be Notified) ____ Same Day ____ Five Day ____ Next Day ____ 5 Day (Rad Only) ____ Two Day ____ 10 Day (Rad Only) ____ Three Day ____ STD TAT	Quote # Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1846705

J146

Acctnum: **CECPPA**
Template: **T270505**
Prelogin: **P1139363**
PM: **3564 - Chad A Upchurch**
PB: CU 3/19/25
Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres							Remarks	Sample # (lab only)
SF-7	Comp	SS		4-8-25	1605	4 X	X	X	X								-01/02
SF-8	Comp	SS		4-9-25	1600	4X	X	X	X								03/04
SF-9	Comp	SS		4-10-25	1610	4	X	X	X								05/06

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH _______ Temp _______

Flow _______ Other _______

Samples returned via:
__ UPS __ FedEx __ Courier ___________

Tracking #

Sample Receipt Checklist ✓
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: ✓Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature) Hannah Enderby	Date: 4/10/2025	Time: 1800	Received by: (Signature)	Trip Blank Received: Yes [✓ No] HCL / MeoH TBR	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 12	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4/11/25 Time: 900	Hold:	Condition: NCF / OK

Multiple Parcel Form

L#

Parcel Tracking Number	Infrared Thermometer ID	Temperature Reading (°C)	Correction Factor (°C)	Corrected Temperature (°C)	Custody Seal Intact
443924451501	A9	4.6	+0.4	=5.0	[✓ Yes] / No / Not Present
443924451475		4.6	+0.4	=5.0	[✓ Yes] / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present

Name

4/11/25
Date

ANALYTICAL REPORT

May 20, 2025

Revised Report

Civil & Environmental Consultants - PA

Sample Delivery Group:	L1849725
Samples Received:	04/18/2025
Project Number:	335-863
Description:	Benwood Shredder Fluff

Report To:

Laura Campbell
700 Cherrington Parkway
Moon Township, PA 15108

Entire Report Reviewed By:

Chad A Upchurch
Project Manager

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

TABLE OF CONTENTS

SAMPLE SUMMARY

SF-10 L1849725-01

Collected by	Collected date/time	Received date/time
SV/HE	04/15/25 15:50	04/18/25 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG2495869	1	04/21/25 13:46	04/21/25 13:46	BTP	Mt. Juliet, TN
Preparation by Method 1311	WG2495874	1	04/22/25 12:58	04/22/25 12:58	JWS	Mt. Juliet, TN
Mercury by Method 7470A	WG2498058	1	04/23/25 12:43	04/24/25 22:45	LAS	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2498280	1	04/24/25 13:33	04/24/25 21:57	RLS	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2498280	1	04/24/25 13:33	04/25/25 12:57	RLS	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2496845	1	04/23/25 21:28	04/23/25 21:28	ACG	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG2499650	1	04/25/25 20:42	04/27/25 04:46	JRM	Mt. Juliet, TN

SF-10 L1849725-02

Collected by	Collected date/time	Received date/time
SV/HE	04/15/25 15:50	04/18/25 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2508755	1	05/07/25 07:23	05/07/25 07:31	CMB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2498798	50	04/22/25 23:54	04/24/25 12:34	CDD	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG2498963	500	04/24/25 16:54	04/25/25 05:26	SGB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2498036	4.6	04/24/25 11:25	04/25/25 16:56	MEW	Mt. Juliet, TN

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

CASE NARRATIVE

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chad A Upchurch
Project Manager

Report Revision History

Level II Report - Version 1: 05/14/25 14:39

Project Narrative

L1849725-02: PCB 1268 removed, per request.

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/22/2025 12:58:39 PM	WG2495874
TCLP ZHE Extraction	-		4/21/2025 1:46:53 PM	WG2495869
Initial pH	8.23		4/22/2025 12:58:39 PM	WG2495874
Final pH	5.90		4/22/2025 12:58:39 PM	WG2495874

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/24/2025 22:45	WG2498058

Metals (ICP) by Method 6010D

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	04/24/2025 21:57	WG2498280
Barium	0.884		0.100	100	1	04/24/2025 21:57	WG2498280
Cadmium	0.173		0.100	1	1	04/24/2025 21:57	WG2498280
Chromium	ND		0.100	5	1	04/24/2025 21:57	WG2498280
Lead	0.234		0.100	5	1	04/24/2025 21:57	WG2498280
Selenium	ND		0.100	1	1	04/24/2025 21:57	WG2498280
Silver	ND		0.100	5	1	04/25/2025 12:57	WG2498280

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/23/2025 21:28	WG2496845
Carbon tetrachloride	ND		0.0500	0.50	1	04/23/2025 21:28	WG2496845
Chlorobenzene	ND		0.0500	100	1	04/23/2025 21:28	WG2496845
Chloroform	ND		0.250	6	1	04/23/2025 21:28	WG2496845
1,2-Dichloroethane	ND		0.0500	0.50	1	04/23/2025 21:28	WG2496845
1,1-Dichloroethene	ND		0.0500	0.70	1	04/23/2025 21:28	WG2496845
2-Butanone (MEK)	ND	C3	0.500	200	1	04/23/2025 21:28	WG2496845
Tetrachloroethene	ND		0.0500	0.70	1	04/23/2025 21:28	WG2496845
Trichloroethene	ND		0.0500	0.50	1	04/23/2025 21:28	WG2496845
Vinyl chloride	ND		0.0500	0.20	1	04/23/2025 21:28	WG2496845
(S) Toluene-d8	*105*		*80.0-120*			*04/23/2025 21:28*	WG2496845
(S) 4-Bromofluorobenzene	*96.3*		*77.0-126*			*04/23/2025 21:28*	WG2496845
(S) 1,2-Dichloroethane-d4	*106*		*70.0-130*			*04/23/2025 21:28*	WG2496845

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/27/2025 04:46	WG2499650
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/27/2025 04:46	WG2499650
Hexachlorobenzene	ND		0.100	0.13	1	04/27/2025 04:46	WG2499650
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/27/2025 04:46	WG2499650
Hexachloroethane	ND		0.100	3	1	04/27/2025 04:46	WG2499650
Nitrobenzene	ND		0.100	2	1	04/27/2025 04:46	WG2499650
Pyridine	ND		0.100	5	1	04/27/2025 04:46	WG2499650
3&4-Methyl Phenol	ND		0.100	400	1	04/27/2025 04:46	WG2499650
2-Methylphenol	ND		0.100	200	1	04/27/2025 04:46	WG2499650
Pentachlorophenol	ND		0.100	100	1	04/27/2025 04:46	WG2499650
2,4,5-Trichlorophenol	ND		0.100	400	1	04/27/2025 04:46	WG2499650
2,4,6-Trichlorophenol	ND		0.100	2	1	04/27/2025 04:46	WG2499650
(S) 2-Fluorophenol	*32.6*		*10.0-120*			*04/27/2025 04:46*	WG2499650

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
(S) Phenol-d5	*22.6*		*10.0-120*			*04/27/2025 04:46*	WG2499650
(S) Nitrobenzene-d5	*69.2*		*10.0-127*			*04/27/2025 04:46*	WG2499650
(S) 2-Fluorobiphenyl	*74.6*		*10.0-130*			*04/27/2025 04:46*	WG2499650
(S) 2,4,6-Tribromophenol	*67.5*		*10.0-155*			*04/27/2025 04:46*	WG2499650
(S) p-Terphenyl-d14	*66.0*		*10.0-128*			*04/27/2025 04:46*	WG2499650

SF-10

Collected date/time: 04/15/25 15:50

SAMPLE RESULTS - 02

L1849725

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	73.9		1	05/07/2025 07:31	WG2508755

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	88.2		7.66	50	04/24/2025 12:34	WG2498798
(S) a,a,a-Trifluorotoluene(FID)	*98.6*		*77.0-120*		*04/24/2025 12:34*	WG2498798

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	11200		2710	500	04/25/2025 05:26	WG2498963
C28-C40 Oil Range	24900		2710	500	04/25/2025 05:26	WG2498963
(S) o-Terphenyl	*0.000*	J7	*18.0-148*		*04/25/2025 05:26*	WG2498963

Polychlorinated Biphenyls (GC) by Method 8082 A

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.211	4.6	04/25/2025 16:56	WG2498036
PCB 1221	ND		0.211	4.6	04/25/2025 16:56	WG2498036
PCB 1232	ND		0.211	4.6	04/25/2025 16:56	WG2498036
PCB 1242	5.62	P	0.211	4.6	04/25/2025 16:56	WG2498036
PCB 1248	ND		0.106	4.6	04/25/2025 16:56	WG2498036
PCB 1254	1.45		0.106	4.6	04/25/2025 16:56	WG2498036
PCB 1260	ND		0.106	4.6	04/25/2025 16:56	WG2498036
(S) Decachlorobiphenyl	*80.1*		*10.0-135*		*04/25/2025 16:56*	WG2498036
(S) Tetrachloro-m-xylene	*54.6*		*10.0-139*		*04/25/2025 16:56*	WG2498036

Method Blank (MB)

(MB) R4211122-1 05/07/25 07:31

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.000			

L1845692-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1845692-10 05/07/25 07:31 • (DUP) R4211122-3 05/07/25 07:31

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	96.6	96.4	1	0.168		10

Laboratory Control Sample (LCS)

(LCS) R4211122-2 05/07/25 07:31

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	90.0-110	

QUALITY CONTROL SUMMARY

L1849725-01

Method Blank (MB)

(MB) R4204893-1 04/24/25 22:16

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.00333	0.0100

Laboratory Control Sample (LCS)

(LCS) R4204893-2 04/24/25 22:18

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.0300	0.0300	100	80.0-120	

L1849731-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1849731-02 04/24/25 22:21 • (MS) R4204893-4 04/24/25 22:31 • (MSD) R4204893-5 04/24/25 22:34

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0292	0.0298	97.3	99.3	1	75.0-125			2.04	20

L1849808-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1849808-01 04/24/25 22:37 • (MS) R4204893-6 04/24/25 22:39 • (MSD) R4204893-7 04/24/25 22:42

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0300	0.0300	100	99.9	1	75.0-125			0.196	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4204820-6 04/24/25 21:45

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.0333	0.100
Barium	U		0.0333	0.100
Cadmium	U		0.0333	0.100
Chromium	U		0.0333	0.100
Lead	U		0.0333	0.100
Selenium	U		0.0333	0.100

Method Blank (MB)

(MB) R4205240-1 04/25/25 12:46

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Silver	U		0.0333	0.100

Laboratory Control Sample (LCS)

(LCS) R4204820-7 04/24/25 21:47

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	10.0	9.45	94.5	80.0-120	
Barium	10.0	9.87	98.7	80.0-120	
Cadmium	10.0	9.62	96.2	80.0-120	
Chromium	10.0	9.75	97.5	80.0-120	
Lead	10.0	9.42	94.2	80.0-120	
Selenium	10.0	9.32	93.2	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R4205240-2 04/25/25 12:47

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Silver	2.00	1.86	93.0	80.0-120	

L1849669-27 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1849669-27 04/24/25 21:48 • (MS) R4204820-9 04/24/25 21:52 • (MSD) R4204820-10 04/24/25 21:54

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	9.81	9.41	98.1	94.1	1	75.0-125			4.10	20
Barium	10.0	ND	10.3	9.99	102	99.1	1	75.0-125			3.30	20
Cadmium	10.0	ND	9.98	9.70	99.8	97.0	1	75.0-125			2.76	20
Chromium	10.0	ND	10.1	9.76	101	97.6	1	75.0-125			3.80	20
Lead	10.0	ND	9.95	9.57	99.0	95.1	1	75.0-125			3.92	20
Selenium	10.0	ND	9.69	9.38	96.9	93.8	1	75.0-125			3.22	20

L1849669-27 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1849669-27 04/25/25 12:49 • (MS) R4205240-4 04/25/25 12:52 • (MSD) R4205240-5 04/25/25 12:54

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Silver	2.00	ND	1.89	1.85	94.4	92.4	1	75.0-125			2.12	20

Method Blank (MB)

(MB) R4204936-2 04/24/25 10:20

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	1.26	J	0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	*101*			*77.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R4204936-1 04/24/25 09:35 • (LCSD) R4204936-3 04/24/25 10:43

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.00	5.07	5.28	101	106	72.0-127			4.06	20
(S) a,a,a-Trifluorotoluene(FID)				*109*	*109*	*77.0-120*				

Method Blank (MB)

(MB) R4205002-2 04/23/25 19:12

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0167	0.0500
Carbon tetrachloride	U		0.0167	0.0500
Chlorobenzene	U		0.0167	0.0500
Chloroform	U		0.0833	0.250
1,2-Dichloroethane	U		0.0167	0.0500
1,1-Dichloroethene	U		0.0167	0.0500
2-Butanone (MEK)	U		0.167	0.500
Tetrachloroethene	U		0.0167	0.0500
Trichloroethene	U		0.0167	0.0500
Vinyl chloride	U		0.0167	0.0500
(S) Toluene-d8	*104*			*80.0-120*
(S) 4-Bromofluorobenzene	*97.2*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*117*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R4205002-1 04/23/25 17:40

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.250	0.214	85.6	70.0-123	
Carbon tetrachloride	0.250	0.271	108	68.0-126	
Chlorobenzene	0.250	0.215	86.0	80.0-121	
Chloroform	0.250	0.236	94.4	73.0-120	
1,2-Dichloroethane	0.250	0.231	92.4	70.0-128	
1,1-Dichloroethene	0.250	0.256	102	71.0-124	
2-Butanone (MEK)	1.25	0.660	52.8	44.0-160	
Tetrachloroethene	0.250	0.245	98.0	72.0-132	
Trichloroethene	0.250	0.251	100	78.0-124	
Vinyl chloride	0.250	0.239	95.6	67.0-131	
(S) Toluene-d8			*96.1*	*80.0-120*	
(S) 4-Bromofluorobenzene			*95.9*	*77.0-126*	
(S) 1,2-Dichloroethane-d4			*118*	*70.0-130*	

L1849669-27 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1849669-27 04/23/25 22:48 • (MS) R4205002-3 04/24/25 05:23 • (MSD) R4205002-4 04/24/25 05:44

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.250	ND	0.230	0.197	92.0	78.8	1	17.0-158			15.5	27
Carbon tetrachloride	0.250	ND	0.284	0.250	114	100	1	23.0-159			12.7	28
Chlorobenzene	0.250	ND	0.246	0.211	98.4	84.4	1	33.0-152			15.3	27
Chloroform	0.250	ND	ND	ND	98.4	86.0	1	29.0-154			13.4	28
1,2-Dichloroethane	0.250	ND	0.206	0.196	82.4	78.4	1	29.0-151			4.98	27
1,1-Dichloroethene	0.250	ND	0.222	0.198	88.8	79.2	1	11.0-160			11.4	29
2-Butanone (MEK)	1.25	ND	0.569	0.540	45.5	43.2	1	10.0-160			5.23	32
Tetrachloroethene	0.250	ND	0.260	0.219	104	87.6	1	10.0-160			17.1	27
Trichloroethene	0.250	ND	0.246	0.200	98.4	80.0	1	10.0-160			20.6	25
Vinyl chloride	0.250	ND	0.219	0.186	87.6	74.4	1	10.0-160			16.3	27
(S) Toluene-d8					*105*	*103*		*80.0-120*				
(S) 4-Bromofluorobenzene					*101*	*98.8*		*77.0-126*				
(S) 1,2-Dichloroethane-d4					*110*	*107*		*70.0-130*				

L1849708-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1849708-01 04/23/25 23:31 • (MS) R4205002-5 04/24/25 06:06

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Benzene	0.250	ND	0.207	82.8	1	17.0-158	
Carbon tetrachloride	0.250	ND	0.257	103	1	23.0-159	
Chlorobenzene	0.250	ND	0.248	99.2	1	33.0-152	
Chloroform	0.250	ND	ND	86.8	1	29.0-154	
1,2-Dichloroethane	0.250	ND	0.200	80.0	1	29.0-151	
1,1-Dichloroethene	0.250	ND	0.347	139	1	11.0-160	
2-Butanone (MEK)	1.25	ND	0.930	74.4	1	10.0-160	
Tetrachloroethene	0.250	ND	0.277	111	1	10.0-160	
Trichloroethene	0.250	ND	0.482	193	1	10.0-160	J5
Vinyl chloride	0.250	ND	0.199	79.6	1	10.0-160	
(S) Toluene-d8				*109*		*80.0-120*	
(S) 4-Bromofluorobenzene				*104*		*77.0-126*	
(S) 1,2-Dichloroethane-d4				*98.5*		*70.0-130*	

Method Blank (MB)

(MB) R4204881-1 04/25/25 01:04

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	*84.7*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R4204881-2 04/25/25 01:16

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	43.7	87.4	50.0-150	
(S) o-Terphenyl			*96.1*	*18.0-148*	

Method Blank (MB)

(MB) R4205726-1 04/25/25 15:11

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.0102	0.0340
PCB 1221	U		0.0107	0.0340
PCB 1232	U		0.0182	0.0340
PCB 1242	U		0.0101	0.0340
PCB 1248	U		0.0124	0.0170
PCB 1254	U		0.0104	0.0170
PCB 1260	U		0.0110	0.0170
(S) Decachlorobiphenyl	*82.4*			*10.0-135*
(S) Tetrachloro-m-xylene	*88.6*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R4205726-2 04/25/25 15:22

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1016	0.167	0.175	105	36.0-141	
PCB 1260	0.167	0.157	94.0	37.0-145	
(S) Decachlorobiphenyl			*83.6*	*10.0-135*	
(S) Tetrachloro-m-xylene			*88.3*	*10.0-139*	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4205881-2 04/26/25 22:05

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
1,4-Dichlorobenzene	U		0.0333	0.100
2,4-Dinitrotoluene	U		0.0333	0.100
Hexachlorobenzene	U		0.0333	0.100
Hexachloro-1,3-butadiene	U		0.0333	0.100
Hexachloroethane	U		0.0333	0.100
Nitrobenzene	U		0.0333	0.100
Pyridine	U		0.0333	0.100
3&4-Methyl Phenol	U		0.0333	0.100
2-Methylphenol	U		0.0333	0.100
Pentachlorophenol	U		0.0333	0.100
2,4,5-Trichlorophenol	U		0.0333	0.100
2,4,6-Trichlorophenol	U		0.0333	0.100
(S) 2-Fluorophenol	*31.8*			*10.0-120*
(S) Phenol-d5	*22.4*			*10.0-120*
(S) Nitrobenzene-d5	*62.7*			*10.0-127*
(S) 2-Fluorobiphenyl	*69.5*			*10.0-130*
(S) 2,4,6-Tribromophenol	*68.0*			*10.0-155*
(S) p-Terphenyl-d14	*75.0*			*10.0-128*

Laboratory Control Sample (LCS)

(LCS) R4205881-1 04/26/25 21:44

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
1,4-Dichlorobenzene	0.500	0.349	69.8	18.0-120	
2,4-Dinitrotoluene	0.500	0.528	106	49.0-124	
Hexachlorobenzene	0.500	0.379	75.8	44.0-120	
Hexachloro-1,3-butadiene	0.500	0.331	66.2	19.0-120	
Hexachloroethane	0.500	0.336	67.2	15.0-120	
Nitrobenzene	0.500	0.337	67.4	27.0-120	
Pyridine	0.500	0.0737	14.7	10.0-120	
3&4-Methyl Phenol	0.500	0.269	53.8	31.0-120	
2-Methylphenol	0.500	0.266	53.2	28.0-120	
Pentachlorophenol	0.500	0.366	73.2	23.0-120	
2,4,5-Trichlorophenol	0.500	0.481	96.2	44.0-120	
2,4,6-Trichlorophenol	0.500	0.442	88.4	42.0-120	
(S) 2-Fluorophenol			*39.8*	*10.0-120*	
(S) Phenol-d5			*26.6*	*10.0-120*	
(S) Nitrobenzene-d5			*68.3*	*10.0-127*	

Laboratory Control Sample (LCS)

(LCS) R4205881-1 04/26/25 21:44

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 2-Fluorobiphenyl			*84.8*	*10.0-130*	
(S) 2,4,6-Tribromophenol			*83.5*	*10.0-155*	
(S) p-Terphenyl-d14			*74.9*	*10.0-128*	

L1849311-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1849311-02 04/27/25 05:39 • (MS) R4207057-1 04/27/25 06:00 • (MSD) R4207057-2 04/27/25 06:21

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,4-Dichlorobenzene	0.500	ND	0.344	0.318	68.8	63.6	1	17.0-120			7.85	40
2,4-Dinitrotoluene	0.500	ND	0.410	0.388	82.0	77.6	1	39.0-125			5.51	25
Hexachlorobenzene	0.500	ND	0.392	0.356	78.4	71.2	1	35.0-122			9.63	24
Hexachloro-1,3-butadiene	0.500	ND	0.307	0.280	61.4	56.0	1	12.0-120			9.20	34
Hexachloroethane	0.500	ND	0.326	0.308	65.2	61.6	1	10.0-120			5.68	40
Nitrobenzene	0.500	ND	0.314	0.286	62.8	57.2	1	12.0-120			9.33	30
Pyridine	0.500	ND	ND	ND	17.7	18.2	1	10.0-120			2.79	37
3&4-Methyl Phenol	0.500	ND	0.265	0.236	53.0	47.2	1	10.0-120			11.6	36
2-Methylphenol	0.500	ND	0.252	0.222	50.4	44.4	1	10.0-120			12.7	30
Pentachlorophenol	0.500	ND	0.340	0.314	68.0	62.8	1	10.0-128			7.95	37
2,4,5-Trichlorophenol	0.500	ND	0.426	0.379	85.2	75.8	1	33.0-120			11.7	31
2,4,6-Trichlorophenol	0.500	ND	0.413	0.355	82.6	71.0	1	26.0-120			15.1	31
(S) 2-Fluorophenol					*36.7*	*33.4*		*10.0-120*				
(S) Phenol-d5					*26.3*	*24.5*		*10.0-120*				
(S) Nitrobenzene-d5					*56.4*	*51.9*		*10.0-127*				
(S) 2-Fluorobiphenyl					*79.0*	*70.2*		*10.0-130*				
(S) 2,4,6-Tribromophenol					*88.0*	*80.0*		*10.0-155*				
(S) p-Terphenyl-d14					*80.8*	*74.9*		*10.0-128*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
C3	The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Method sensitivity check is acceptable.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
P	RPD between the primary and confirmatory analysis exceeded 40%.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico[1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina[1]	DW21704
Georgia	NELAP	North Carolina[3]	41
Georgia[1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky[1,6]	KY90010	South Carolina	84004002
Kentucky[2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee[1,4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas[5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025[5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Civil & Environmental Consultants - PA

700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:
Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Report to:
Laura Campbell 800-365-2324

Email To: **lcampbell@cecinc.com**

Project Description:
Benwood Shredder Fluff

City/State Collected: Benwood WV

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
335-863

Lab Project #
CECPPA-BENWOOD

Collected by (print): SV HE

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y X

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day ____ STD TAT

Quote #

Date Results Needed

Chain of Custody Page 1 of 1

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1849725

Table # T143

Acctnum: **CECPPA**
Template: **T270505**
Prelogin: **P1139369**
PM: **3564 - Chad A Upchurch**
PB: 3/20/25 BK
Shipped Via: **FedEX Ground**

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres							Remarks	Sample # (lab only)
SF-10	Comp	SS	NA	4-15-25	1550	2			X								-01
SF-10	Comp	SS	NA	4-15-25	1550	2	X	X									-02

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ________ Temp ________

Flow ________ Other ________

Samples returned via:
__ UPS __ FedEx __ Courier ________

Tracking # 4439 2445 8631

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	
	4-15-25	1730		Trip Blank Received: Yes [✓ No] HCL / MeoH TBR
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 4 TUA9 4.5 to.4 4.9
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4-18-2025 Time: 0845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / [✓ OK]

ANALYTICAL REPORT

May 20, 2025

Revised Report

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Civil & Environmental Consultants - PA

Sample Delivery Group:	L1851474
Samples Received:	04/24/2025
Project Number:	334-094
Description:	Benwood Shredder Fluff
Report To:	Laura Campbell 700 Cherrington Parkway Moon Township, PA 15108

Entire Report Reviewed By:

Chad A Upchurch
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

TABLE OF CONTENTS

SAMPLE SUMMARY

SF-11 L1851474-01

Collected by	Collected date/time	Received date/time
HE/SAV	04/22/25 15:50	04/24/25 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG2499501	1	04/25/25 09:47	04/25/25 09:47	JWS	Mt. Juliet, TN
Preparation by Method 1311	WG2499504	1	04/27/25 03:51	04/27/25 03:51	PNK	Mt. Juliet, TN
Mercury by Method 7470A	WG2500726	1	04/26/25 23:47	04/28/25 12:19	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2501557	1	05/01/25 11:20	05/01/25 17:55	MAP	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG2502172	1	04/29/25 14:00	04/29/25 14:00	KST	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270E	WG2500995	1	05/03/25 08:54	05/04/25 23:40	JCH	Mt. Juliet, TN

SF-11 L1851474-02

Collected by	Collected date/time	Received date/time
HE/SAV	04/22/25 15:50	04/24/25 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2508755	1	05/07/25 07:23	05/07/25 07:31	CMB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2502943	125	04/22/25 15:50	04/30/25 01:07	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG2503686	1000	05/01/25 10:28	05/02/25 13:15	SGB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2502535	162	04/29/25 17:18	04/30/25 13:34	LTB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2502535	3.23	04/29/25 17:18	04/30/25 04:00	LJD	Mt. Juliet, TN

SF-12 L1851474-03

Collected by	Collected date/time	Received date/time
HE/SAV	04/23/25 16:15	04/24/25 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG2499501	1	04/25/25 09:47	04/25/25 09:47	JWS	Mt. Juliet, TN
Preparation by Method 1311	WG2499504	1	04/27/25 03:51	04/27/25 03:51	PNK	Mt. Juliet, TN
Mercury by Method 7470A	WG2500726	1	04/26/25 23:47	04/28/25 12:22	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2501557	1	05/01/25 11:20	05/01/25 18:04	MAP	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG2502172	1	04/29/25 14:20	04/29/25 14:20	KST	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270E	WG2500995	1	05/03/25 08:54	05/05/25 00:01	JCH	Mt. Juliet, TN

SF-12 L1851474-04

Collected by	Collected date/time	Received date/time
HE/SAV	04/23/25 16:15	04/24/25 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG2508755	1	05/07/25 07:23	05/07/25 07:31	CMB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2502943	100	04/23/25 16:15	04/30/25 03:53	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG2502579	526	04/30/25 07:53	05/01/25 05:50	SGB	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2502535	13.9	04/29/25 17:18	04/30/25 03:51	LJD	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082 A	WG2502535	27.8	04/29/25 17:18	04/30/25 12:06	LTB	Mt. Juliet, TN

CASE NARRATIVE

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chad A Upchurch
Project Manager

Report Revision History

Level II Report - Version 1: 05/14/25 14:41

Project Narrative

L1851474-01, L1851474-03: TCLP VOC compounds updated.
L1851474-02, L1851474-04: PCB 1268 removed.

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/25/2025 9:47:30 AM	WG2499501
TCLP ZHE Extraction	-		4/27/2025 3:51:54 AM	WG2499504
Initial pH	8.71		4/25/2025 9:47:30 AM	WG2499501
Final pH	5.58		4/25/2025 9:47:30 AM	WG2499501

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/28/2025 12:19	WG2500726

Metals (ICP) by Method 6010D

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	05/01/2025 17:55	WG2501557
Barium	0.748		0.100	100	1	05/01/2025 17:55	WG2501557
Cadmium	ND		0.100	1	1	05/01/2025 17:55	WG2501557
Chromium	ND		0.100	5	1	05/01/2025 17:55	WG2501557
Lead	ND		0.100	5	1	05/01/2025 17:55	WG2501557
Selenium	ND		0.100	1	1	05/01/2025 17:55	WG2501557
Silver	ND		0.100	5	1	05/01/2025 17:55	WG2501557

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/29/2025 14:00	WG2502172
Carbon tetrachloride	ND		0.0500	0.50	1	04/29/2025 14:00	WG2502172
Chlorobenzene	ND		0.0500	100	1	04/29/2025 14:00	WG2502172
Chloroform	ND		0.250	6	1	04/29/2025 14:00	WG2502172
1,2-Dichloroethane	ND		0.0500	0.50	1	04/29/2025 14:00	WG2502172
1,1-Dichloroethene	ND		0.0500	0.70	1	04/29/2025 14:00	WG2502172
2-Butanone (MEK)	ND		0.500	200	1	04/29/2025 14:00	WG2502172
Tetrachloroethene	ND		0.0500	0.70	1	04/29/2025 14:00	WG2502172
Trichloroethene	ND		0.0500	0.50	1	04/29/2025 14:00	WG2502172
Vinyl chloride	ND		0.0500	0.20	1	04/29/2025 14:00	WG2502172
(S) Toluene-d8	*104*		*80.0-120*			*04/29/2025 14:00*	WG2502172
(S) 4-Bromofluorobenzene	*95.6*		*77.0-126*			*04/29/2025 14:00*	WG2502172
(S) 1,2-Dichloroethane-d4	*113*		*70.0-130*			*04/29/2025 14:00*	WG2502172

Semi Volatile Organic Compounds (GC/MS) by Method 8270E

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	05/04/2025 23:40	WG2500995
2,4-Dinitrotoluene	ND		0.100	0.13	1	05/04/2025 23:40	WG2500995
Hexachlorobenzene	ND		0.100	0.13	1	05/04/2025 23:40	WG2500995
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	05/04/2025 23:40	WG2500995
Hexachloroethane	ND		0.100	3	1	05/04/2025 23:40	WG2500995
Nitrobenzene	ND		0.100	2	1	05/04/2025 23:40	WG2500995
Pyridine	ND		0.100	5	1	05/04/2025 23:40	WG2500995
3&4-Methyl Phenol	ND		0.100	400	1	05/04/2025 23:40	WG2500995
2-Methylphenol	ND	C3	0.100	200	1	05/04/2025 23:40	WG2500995
Pentachlorophenol	ND	C3	0.100	100	1	05/04/2025 23:40	WG2500995
2,4,5-Trichlorophenol	ND		0.100	400	1	05/04/2025 23:40	WG2500995
2,4,6-Trichlorophenol	ND		0.100	2	1	05/04/2025 23:40	WG2500995
(S) 2-Fluorophenol	*33.4*		*10.0-120*			*05/04/2025 23:40*	WG2500995

Semi Volatile Organic Compounds (GC/MS) by Method 8270E

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
(S) Phenol-d5	*23.6*		*10.0-120*			*05/04/2025 23:40*	WG2500995
(S) Nitrobenzene-d5	*68.1*		*10.0-127*			*05/04/2025 23:40*	WG2500995
(S) 2-Fluorobiphenyl	*72.7*		*10.0-130*			*05/04/2025 23:40*	WG2500995
(S) 2,4,6-Tribromophenol	*74.5*		*10.0-155*			*05/04/2025 23:40*	WG2500995
(S) p-Terphenyl-d14	*66.0*		*10.0-128*			*05/04/2025 23:40*	WG2500995

Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	%			date / time	
Total Solids	76.7		1	05/07/2025 07:31	WG2508755

Volatile Organic Compounds (GC) by Method 8015D/GRO

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
TPH (GC/FID) Low Fraction	172		17.1	125	04/30/2025 01:07	WG2502943
(S) a,a,a-Trifluorotoluene(FID)	*101*		*77.0-120*		*04/30/2025 01:07*	WG2502943

Semi-Volatile Organic Compounds (GC) by Method 8015

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	7120		5220	1000	05/02/2025 13:15	WG2503686
C28-C40 Oil Range	13300		5220	1000	05/02/2025 13:15	WG2503686
(S) o-Terphenyl	*0.000*	J7	*18.0-148*		*05/02/2025 13:15*	WG2503686

Polychlorinated Biphenyls (GC) by Method 8082 A

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
PCB 1016	ND	J5	0.143	3.23	04/30/2025 04:00	WG2502535
PCB 1221	ND		0.143	3.23	04/30/2025 04:00	WG2502535
PCB 1232	ND		0.143	3.23	04/30/2025 04:00	WG2502535
PCB 1242	ND		0.143	3.23	04/30/2025 04:00	WG2502535
PCB 1248	ND		0.0716	3.23	04/30/2025 04:00	WG2502535
PCB 1254	201		3.59	162	04/30/2025 13:34	WG2502535
PCB 1260	ND	J5	0.0716	3.23	04/30/2025 04:00	WG2502535
(S) Decachlorobiphenyl	*83.3*		*10.0-135*		*04/30/2025 04:00*	WG2502535
(S) Decachlorobiphenyl	*85.1*	J7	*10.0-135*		*04/30/2025 13:34*	WG2502535
(S) Tetrachloro-m-xylene	*60.9*		*10.0-139*		*04/30/2025 04:00*	WG2502535
(S) Tetrachloro-m-xylene	*63.7*	J7	*10.0-139*		*04/30/2025 13:34*	WG2502535

Sample Narrative:

L1851474-02 WG2502535: Dilution due to matrix impact during extraction procedure

SF-12
Collected date/time: 04/23/25 16:15

SAMPLE RESULTS - 03

L1851474

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/25/2025 9:47:30 AM	WG2499501
TCLP ZHE Extraction	-		4/27/2025 3:51:54 AM	WG2499504
Initial pH	8.69		4/25/2025 9:47:30 AM	WG2499501
Final pH	5.44		4/25/2025 9:47:30 AM	WG2499501

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/28/2025 12:22	WG2500726

Metals (ICP) by Method 6010D

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	05/01/2025 18:04	WG2501557
Barium	0.625		0.100	100	1	05/01/2025 18:04	WG2501557
Cadmium	ND		0.100	1	1	05/01/2025 18:04	WG2501557
Chromium	ND		0.100	5	1	05/01/2025 18:04	WG2501557
Lead	ND		0.100	5	1	05/01/2025 18:04	WG2501557
Selenium	ND		0.100	1	1	05/01/2025 18:04	WG2501557
Silver	ND		0.100	5	1	05/01/2025 18:04	WG2501557

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/29/2025 14:20	WG2502172
Carbon tetrachloride	ND		0.0500	0.50	1	04/29/2025 14:20	WG2502172
Chlorobenzene	ND		0.0500	100	1	04/29/2025 14:20	WG2502172
Chloroform	ND		0.250	6	1	04/29/2025 14:20	WG2502172
1,2-Dichloroethane	ND		0.0500	0.50	1	04/29/2025 14:20	WG2502172
1,1-Dichloroethene	ND		0.0500	0.70	1	04/29/2025 14:20	WG2502172
2-Butanone (MEK)	ND		0.500	200	1	04/29/2025 14:20	WG2502172
Tetrachloroethene	ND		0.0500	0.70	1	04/29/2025 14:20	WG2502172
Trichloroethene	ND		0.0500	0.50	1	04/29/2025 14:20	WG2502172
Vinyl chloride	ND		0.0500	0.20	1	04/29/2025 14:20	WG2502172
(S) Toluene-d8	*104*		*80.0-120*			*04/29/2025 14:20*	WG2502172
(S) 4-Bromofluorobenzene	*95.3*		*77.0-126*			*04/29/2025 14:20*	WG2502172
(S) 1,2-Dichloroethane-d4	*113*		*70.0-130*			*04/29/2025 14:20*	WG2502172

Semi Volatile Organic Compounds (GC/MS) by Method 8270E

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	05/05/2025 00:01	WG2500995
2,4-Dinitrotoluene	ND		0.100	0.13	1	05/05/2025 00:01	WG2500995
Hexachlorobenzene	ND		0.100	0.13	1	05/05/2025 00:01	WG2500995
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	05/05/2025 00:01	WG2500995
Hexachloroethane	ND		0.100	3	1	05/05/2025 00:01	WG2500995
Nitrobenzene	ND		0.100	2	1	05/05/2025 00:01	WG2500995
Pyridine	ND		0.100	5	1	05/05/2025 00:01	WG2500995
3&4-Methyl Phenol	ND		0.100	400	1	05/05/2025 00:01	WG2500995
2-Methylphenol	ND	C3	0.100	200	1	05/05/2025 00:01	WG2500995
Pentachlorophenol	ND	C3	0.100	100	1	05/05/2025 00:01	WG2500995
2,4,5-Trichlorophenol	ND		0.100	400	1	05/05/2025 00:01	WG2500995
2,4,6-Trichlorophenol	ND		0.100	2	1	05/05/2025 00:01	WG2500995
(S) 2-Fluorophenol	*33.4*		*10.0-120*			*05/05/2025 00:01*	WG2500995

Semi Volatile Organic Compounds (GC/MS) by Method 8270E

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
(S) Phenol-d5	*23.3*		*10.0-120*			*05/05/2025 00:01*	WG2500995
(S) Nitrobenzene-d5	*67.4*		*10.0-127*			*05/05/2025 00:01*	WG2500995
(S) 2-Fluorobiphenyl	*70.7*		*10.0-130*			*05/05/2025 00:01*	WG2500995
(S) 2,4,6-Tribromophenol	*73.0*		*10.0-155*			*05/05/2025 00:01*	WG2500995
(S) p-Terphenyl-d14	*65.3*		*10.0-128*			*05/05/2025 00:01*	WG2500995

SF-12
Collected date/time: 04/23/25 16:15

SAMPLE RESULTS - 04

L1851474

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Total Solids by Method 2540 G-2011

	Result	Qualifier	Dilution	Analysis	Batch
Analyte	%			date / time	
Total Solids	77.5		1	05/07/2025 07:31	WG2508755

Volatile Organic Compounds (GC) by Method 8015D/GRO

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
TPH (GC/FID) Low Fraction	357		15.8	100	04/30/2025 03:53	WG2502943
(S) a,a,a-Trifluorotoluene(FID)	*101*		*77.0-120*		*04/30/2025 03:53*	WG2502943

Semi-Volatile Organic Compounds (GC) by Method 8015

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	13300		2710	526	05/01/2025 05:50	WG2502579
C28-C40 Oil Range	17800		2710	526	05/01/2025 05:50	WG2502579
(S) o-Terphenyl	*0.000*	J7	*18.0-148*		*05/01/2025 05:50*	WG2502579

Sample Narrative:

L1851474-04 WG2502579: Cannot run at lower dilution due to viscosity of extract

Polychlorinated Biphenyls (GC) by Method 8082 A

	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
Analyte	mg/kg		mg/kg		date / time	
PCB 1016	ND		0.610	13.9	04/30/2025 03:51	WG2502535
PCB 1221	ND		0.610	13.9	04/30/2025 03:51	WG2502535
PCB 1232	ND		0.610	13.9	04/30/2025 03:51	WG2502535
PCB 1242	26.6		1.22	27.8	04/30/2025 12:06	WG2502535
PCB 1248	ND		0.304	13.9	04/30/2025 03:51	WG2502535
PCB 1254	ND		0.304	13.9	04/30/2025 03:51	WG2502535
PCB 1260	ND		0.304	13.9	04/30/2025 03:51	WG2502535
(S) Decachlorobiphenyl	*59.7*		*10.0-135*		*04/30/2025 03:51*	WG2502535
(S) Decachlorobiphenyl	*66.8*		*10.0-135*		*04/30/2025 12:06*	WG2502535
(S) Tetrachloro-m-xylene	*72.2*		*10.0-139*		*04/30/2025 03:51*	WG2502535
(S) Tetrachloro-m-xylene	*70.3*		*10.0-139*		*04/30/2025 12:06*	WG2502535

Sample Narrative:

L1851474-04 WG2502535: Dilution due to matrix impact during extraction procedure

WG2508755

Total Solids by Method 2540 G-2011

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4211122-1 05/07/25 07:31

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	%		%	%
Total Solids	0.000			

L1845692-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1845692-10 05/07/25 07:31 • (DUP) R4211122-3 05/07/25 07:31

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	%	%		%		%
Total Solids	96.6	96.4	1	0.168		10

Laboratory Control Sample (LCS)

(LCS) R4211122-2 05/07/25 07:31

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	90.0-110	

QUALITY CONTROL SUMMARY

L1851474-01,03

Method Blank (MB)

(MB) R4206320-1 04/28/25 11:47

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.00333	0.0100

Laboratory Control Sample (LCS)

(LCS) R4206320-2 04/28/25 11:58

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.0300	0.0292	97.4	80.0-120	

L1851423-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1851423-01 04/28/25 12:01 • (MS) R4206320-4 04/28/25 12:06 • (MSD) R4206320-5 04/28/25 12:09

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0296	0.0300	98.7	100	1	75.0-125			1.43	20

L1851480-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1851480-02 04/28/25 12:12 • (MS) R4206320-6 04/28/25 12:14 • (MSD) R4206320-7 04/28/25 12:17

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0306	0.0288	102	96.1	1	75.0-125			5.87	20

Method Blank (MB)

(MB) R4208669-1 05/01/25 17:30

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.0333	0.100
Barium	U		0.0333	0.100
Cadmium	U		0.0333	0.100
Chromium	U		0.0333	0.100
Lead	U		0.0333	0.100
Selenium	U		0.0333	0.100
Silver	U		0.0333	0.100

Laboratory Control Sample (LCS)

(LCS) R4208669-2 05/01/25 17:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	10.0	10.0	100	80.0-120	
Barium	10.0	10.2	102	80.0-120	
Cadmium	10.0	9.79	97.9	80.0-120	
Chromium	10.0	10.2	102	80.0-120	
Lead	10.0	9.65	96.5	80.0-120	
Selenium	10.0	9.89	98.9	80.0-120	
Silver	2.00	1.69	84.3	80.0-120	

L1851501-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1851501-02 05/01/25 17:35 • (MS) R4208669-4 05/01/25 17:41 • (MSD) R4208669-5 05/01/25 17:44

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	10.1	10.0	101	100	1	75.0-125			1.39	20
Barium	10.0	ND	10.4	10.2	103	101	1	75.0-125			1.37	20
Cadmium	10.0	ND	9.88	9.70	98.8	97.0	1	75.0-125			1.89	20
Chromium	10.0	ND	10.3	10.2	103	102	1	75.0-125			1.23	20
Lead	10.0	ND	9.79	9.53	97.9	95.3	1	75.0-125			2.63	20
Selenium	10.0	ND	10.1	9.88	101	98.8	1	75.0-125			2.45	20
Silver	2.00	ND	1.71	1.67	85.5	83.5	1	75.0-125			2.33	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4207559-2 04/29/25 21:46

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	*99.3*			*77.0-120*

Laboratory Control Sample (LCS)

(LCS) R4207559-1 04/29/25 20:37

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.00	4.91	98.2	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*100*	*77.0-120*	

Method Blank (MB)

(MB) R4207741-3 04/29/25 10:39

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Benzene	U		0.0167	0.0500
Carbon tetrachloride	U		0.0167	0.0500
Chlorobenzene	U		0.0167	0.0500
Chloroform	U		0.0833	0.250
1,2-Dichloroethane	U		0.0167	0.0500
1,1-Dichloroethene	U		0.0167	0.0500
2-Butanone (MEK)	U		0.167	0.500
Tetrachloroethene	U		0.0167	0.0500
Trichloroethene	U		0.0167	0.0500
Vinyl chloride	U		0.0167	0.0500
(S) Toluene-d8	*104*			*80.0-120*
(S) 4-Bromofluorobenzene	*93.9*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*112*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R4207741-1 04/29/25 07:52 • (LCSD) R4207741-2 04/29/25 09:57

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Benzene	0.250	0.235	0.242	94.0	96.8	70.0-123			2.94	20
Carbon tetrachloride	0.250	0.271	0.290	108	116	68.0-126			6.77	20
Chlorobenzene	0.250	0.275	0.261	110	104	80.0-121			5.22	20
Chloroform	0.250	0.257	0.264	103	106	73.0-120			2.69	20
1,2-Dichloroethane	0.250	0.278	0.287	111	115	70.0-128			3.19	20
1,1-Dichloroethene	0.250	0.264	0.252	106	101	71.0-124			4.65	20
2-Butanone (MEK)	1.25	1.22	1.12	97.6	89.6	44.0-160			8.55	20
Tetrachloroethene	0.250	0.293	0.267	117	107	72.0-132			9.29	20
Trichloroethene	0.250	0.252	0.245	101	98.0	78.0-124			2.82	20
Vinyl chloride	0.250	0.261	0.251	104	100	67.0-131			3.91	20
(S) Toluene-d8				*105*	*103*	*80.0-120*				
(S) 4-Bromofluorobenzene				*96.9*	*98.9*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*110*	*113*	*70.0-130*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

L1852360-17 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1852360-17 04/29/25 13:39 • (MS) R4207741-4 04/29/25 18:37 • (MSD) R4207741-5 04/29/25 18:57

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Benzene	0.250	ND	0.268	0.262	107	105	1	17.0-158			2.26	27
Carbon tetrachloride	0.250	ND	0.350	0.328	140	131	1	23.0-159			6.49	28
Chlorobenzene	0.250	ND	0.307	0.295	123	118	1	33.0-152			3.99	27
Chloroform	0.250	ND	0.297	0.277	119	111	1	29.0-154			6.97	28
1,2-Dichloroethane	0.250	ND	0.316	0.310	126	124	1	29.0-151			1.92	27
1,1-Dichloroethene	0.250	ND	0.315	0.294	126	118	1	11.0-160			6.90	29
2-Butanone (MEK)	1.25	ND	1.14	1.11	91.2	88.8	1	10.0-160			2.67	32
Tetrachloroethene	0.250	ND	0.328	0.297	131	119	1	10.0-160			9.92	27
Trichloroethene	0.250	ND	0.278	0.279	111	112	1	10.0-160			0.359	25
Vinyl chloride	0.250	ND	0.300	0.288	120	115	1	10.0-160			4.08	27
(S) Toluene-d8					*105*	*104*		*80.0-120*				
(S) 4-Bromofluorobenzene					*98.1*	*100*		*77.0-126*				
(S) 1,2-Dichloroethane-d4					*113*	*110*		*70.0-130*				

Method Blank (MB)

(MB) R4207971-1 04/30/25 23:01

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	*80.0*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R4207971-2 04/30/25 23:14

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	38.7	77.4	50.0-150	
(S) o-Terphenyl			*79.0*	*18.0-148*	

L1851490-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1851490-08 05/01/25 04:30 • (MS) R4207971-3 05/01/25 04:44 • (MSD) R4207971-4 05/01/25 04:57

Analyte	Spike Amount (dry) mg/kg	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	55.6	4.84	42.4	44.9	67.4	72.1	1	50.0-150			5.77	20
(S) o-Terphenyl					*70.8*	*73.1*		*18.0-148*				

Method Blank (MB)

(MB) R4208555-1 05/01/25 22:06

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	*59.8*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R4208555-2 05/01/25 22:20

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	36.7	73.4	50.0-150	
(S) o-Terphenyl			*55.9*	*18.0-148*	

L1851839-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1851839-02 05/02/25 12:32 • (MS) R4208994-1 05/02/25 12:47 • (MSD) R4208994-2 05/02/25 13:01

Analyte	Spike Amount (dry) mg/kg	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	69.7	17.2	82.0	81.4	93.0	92.7	2	50.0-150			0.703	20
(S) o-Terphenyl					*53.3*	*57.0*		*18.0-148*				

Sample Narrative:

OS: Dilution due to matrix impact during extract concentration procedure.

WG2502535

Polychlorinated Biphenyls (GC) by Method 8082 A

QUALITY CONTROL SUMMARY

L1851474-02,04

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4207429-1 04/30/25 00:35

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.0102	0.0340
PCB 1221	U		0.0107	0.0340
PCB 1232	U		0.0182	0.0340
PCB 1242	U		0.0101	0.0340
PCB 1248	U		0.0124	0.0170
PCB 1254	U		0.0104	0.0170
PCB 1260	U		0.0110	0.0170
(S) Decachlorobiphenyl	*81.5*			*10.0-135*
(S) Tetrachloro-m-xylene	*91.6*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R4207429-2 04/30/25 00:44

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1016	0.167	0.117	70.1	36.0-141	
PCB 1260	0.167	0.113	67.7	37.0-145	
(S) Decachlorobiphenyl			*80.9*	*10.0-135*	
(S) Tetrachloro-m-xylene			*85.6*	*10.0-139*	

L1851474-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1851474-02 04/30/25 04:00 • (MS) R4207429-3 04/30/25 04:09 • (MSD) R4207429-4 04/30/25 04:19

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1016	0.649	ND	3.31	3.40	510	489	2.99	10.0-160	J5	J5	2.72	37
PCB 1260	0.649	ND	1.32	1.33	203	191	2.99	10.0-160	J5	J5	0.985	38
(S) Decachlorobiphenyl					*88.4*	*88.7*		*10.0-135*				
(S) Tetrachloro-m-xylene					*68.3*	*60.6*		*10.0-139*				

Sample Narrative:

OS: Dilution due to matrix impact during extraction procedure

Method Blank (MB)

(MB) R4210006-2 05/04/25 16:33

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
1,4-Dichlorobenzene	U		0.0333	0.100
2,4-Dinitrotoluene	U		0.0333	0.100
Hexachlorobenzene	U		0.0333	0.100
Hexachloro-1,3-butadiene	U		0.0333	0.100
Hexachloroethane	U		0.0333	0.100
Nitrobenzene	U		0.0333	0.100
Pyridine	U		0.0333	0.100
3&4-Methyl Phenol	U		0.0333	0.100
2-Methylphenol	U		0.0333	0.100
Pentachlorophenol	U		0.0333	0.100
2,4,5-Trichlorophenol	U		0.0333	0.100
2,4,6-Trichlorophenol	U		0.0333	0.100
(S) 2-Fluorophenol	*32.6*			*10.0-120*
(S) Phenol-d5	*25.0*			*10.0-120*
(S) Nitrobenzene-d5	*62.0*			*10.0-127*
(S) 2-Fluorobiphenyl	*70.5*			*10.0-130*
(S) 2,4,6-Tribromophenol	*71.0*			*10.0-155*
(S) p-Terphenyl-d14	*69.5*			*10.0-128*

Laboratory Control Sample (LCS)

(LCS) R4210006-1 05/04/25 16:11

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
1,4-Dichlorobenzene	0.500	0.314	62.8	18.0-120	
2,4-Dinitrotoluene	0.500	0.432	86.4	49.0-124	
Hexachlorobenzene	0.500	0.353	70.6	44.0-120	
Hexachloro-1,3-butadiene	0.500	0.340	68.0	19.0-120	
Hexachloroethane	0.500	0.300	60.0	15.0-120	
Nitrobenzene	0.500	0.284	56.8	27.0-120	
Pyridine	0.500	0.125	25.0	10.0-120	
3&4-Methyl Phenol	0.500	0.211	42.2	31.0-120	
2-Methylphenol	0.500	0.202	40.4	28.0-120	
Pentachlorophenol	0.500	0.259	51.8	23.0-120	
2,4,5-Trichlorophenol	0.500	0.396	79.2	44.0-120	
2,4,6-Trichlorophenol	0.500	0.378	75.6	42.0-120	
(S) 2-Fluorophenol			*30.0*	*10.0-120*	
(S) Phenol-d5			*21.1*	*10.0-120*	
(S) Nitrobenzene-d5			*59.5*	*10.0-127*	

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Laboratory Control Sample (LCS)

(LCS) R4210006-1 05/04/25 16:11

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/l	mg/l	%	%	
(S) 2-Fluorobiphenyl			*67.6*	*10.0-130*	
(S) 2,4,6-Tribromophenol			*73.0*	*10.0-155*	
(S) p-Terphenyl-d14			*61.7*	*10.0-128*	

L1851016-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1851016-01 05/04/25 17:15 • (MS) R4210006-3 05/04/25 17:37 • (MSD) R4210006-4 05/04/25 17:58

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
1,4-Dichlorobenzene	0.500	ND	0.333	0.306	66.6	61.2	1	17.0-120			8.45	40
2,4-Dinitrotoluene	0.500	ND	0.477	0.462	95.4	92.4	1	39.0-125			3.19	25
Hexachlorobenzene	0.500	ND	0.388	0.377	77.6	75.4	1	35.0-122			2.88	24
Hexachloro-1,3-butadiene	0.500	ND	0.371	0.346	74.2	69.2	1	12.0-120			6.97	34
Hexachloroethane	0.500	ND	0.319	0.294	63.8	58.8	1	10.0-120			8.16	40
Nitrobenzene	0.500	ND	0.311	0.292	62.2	58.4	1	12.0-120			6.30	30
Pyridine	0.500	ND	0.131	ND	26.2	15.3	1	10.0-120		J3	52.7	37
3&4-Methyl Phenol	0.500	ND	0.248	0.214	49.6	42.8	1	10.0-120			14.7	36
2-Methylphenol	0.500	ND	0.242	0.203	48.4	40.6	1	10.0-120			17.5	30
Pentachlorophenol	0.500	ND	0.250	0.238	50.0	47.6	1	10.0-128			4.92	37
2,4,5-Trichlorophenol	0.500	ND	0.421	0.394	84.2	78.8	1	33.0-120			6.63	31
2,4,6-Trichlorophenol	0.500	ND	0.423	0.388	84.6	77.6	1	26.0-120			8.63	31
(S) 2-Fluorophenol					*34.8*	*29.6*		*10.0-120*				
(S) Phenol-d5					*23.8*	*21.9*		*10.0-120*				
(S) Nitrobenzene-d5					*64.4*	*61.8*		*10.0-127*				
(S) 2-Fluorobiphenyl					*77.3*	*72.7*		*10.0-130*				
(S) 2,4,6-Tribromophenol					*80.0*	*76.5*		*10.0-155*				
(S) p-Terphenyl-d14					*66.9*	*63.6*		*10.0-128*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
C3	The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Method sensitivity check is acceptable.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1,6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1,4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Company Name/Address:

Civil & Environmental Consultants - PA

700 Cherrington Parkway
Moon Township, PA 15108

Billing Information:

Accounts Payable
700 Cherrington Parkway
Moon Township, PA 15108

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

Report to: Laura Campbell 800-365-2324

Email To: lcampbell@cecinc.com

Project Description: Benwood Shredder Fluff

City/State Collected: Benwood WV

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project # ~~335-863~~ SAV 334-094

Lab Project # CECPPA-BENWOOD

Collected by (print): HE SAV

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ____

Rush? (Lab MUST Be Notified)

- ____ Same Day
- X Five Day
- ____ Next Day
- ____ 5 Day (Rad Only)
- ____ Two Day
- ____ 10 Day (Rad Only)
- ____ Three Day
- ____ STD TAT

Quote #

Date Results Needed

SDG # L1851474

1034

Acctnum: CECPPA

Template: T270505

Prelogin: P1139365

PM: 3564 - Chad A Upchurch

PB: 3/20/25 BK

Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DRORLA, SV8082 4ozClr-NoPres	GRO 40mlAmb/MeOH10ml/Syr	TCLP VOC/SVOC/METALS 1L-Clr-NoPres								Remarks	Sample # (lab only)
SF-11	C	SS		4/22/24	1550	2			X									-01
↑	C	SS		↑	↑	2	X	X										-02
SF-12	C	SS		4-23-25	1615	2			X									-03
SF-12	C	SS		4-23-25	1615	2	X	X										-04

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other________

Remarks:

pH ______ Temp ______

Flow ______ Other ______

Samples returned via:
__ UPS X FedEx __ Courier ________

Tracking # 4439 2445 8723

Sample Receipt Checklist

COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: ✓Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	
	4-23-25	1830		Trip Blank Received: [✓ Yes] / No [✓ HCL] / MeoH TBR 1
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 8 TH491.9+0.4=2.3
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4-24-25 Time: 0845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / [✓ OK]

ATTACHMENT C

ProUCL OUTPUTS

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.2 5/20/2025 9:27:12 AM
From File	ProUCL concentrations.xls
Full Precision	OFF
Confidence Coefficient	90%
Number of Bootstrap Operations	2000

GRO

General Statistics

Total Number of Observations	12	Number of Distinct Observations	12
		Number of Missing Observations	0
Minimum	34.4	Mean	222.6
Maximum	418	Median	226.5
SD	149.3	Std. Error of Mean	43.1
Coefficient of Variation	0.671	Skewness	-0.0282

Normal GOF Test

Shapiro Wilk Test Statistic	0.893	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.805	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.149	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.281	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

90% Normal UCL		**90% UCLs (Adjusted for Skewness)**	
90% Student's-t UCL	281.4	90% Adjusted-CLT UCL (Chen-1995)	277.6
		90% Modified-t UCL (Johnson-1978)	281.3

Gamma GOF Test

A-D Test Statistic	0.648	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.744	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.197	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.249	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.645	k star (bias corrected MLE)	1.289
Theta hat (MLE)	135.3	Theta star (bias corrected MLE)	172.7
nu hat (MLE)	39.48	nu star (bias corrected)	30.94
MLE Mean (bias corrected)	222.6	MLE Sd (bias corrected)	196
		Approximate Chi Square Value (0.1)	21.38
Adjusted Level of Significance	0.0752	Adjusted Chi Square Value	20.44

Assuming Gamma Distribution

90% Approximate Gamma UCL	322.1	90% Adjusted Gamma UCL	337

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.842	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.883	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.207	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.223	Data appear Lognormal at 10% Significance Level

Data appear Approximate Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.538	Mean of logged Data	5.072
Maximum of Logged Data	6.035	SD of logged Data	0.97

Assuming Lognormal Distribution

90% H-UCL	462.9	90% Chebyshev (MVUE) UCL	459.1
95% Chebyshev (MVUE) UCL	557.3	97.5% Chebyshev (MVUE) UCL	693.7
99% Chebyshev (MVUE) UCL	961.7		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

90% CLT UCL	277.8	90% BCA Bootstrap UCL	272.2
90% Standard Bootstrap UCL	275.8	90% Bootstrap-t UCL	279.7
90% Hall's Bootstrap UCL	273.5	90% Percentile Bootstrap UCL	276
90% Chebyshev(Mean, Sd) UCL	351.9	95% Chebyshev(Mean, Sd) UCL	410.5
97.5% Chebyshev(Mean, Sd) UCL	491.8	99% Chebyshev(Mean, Sd) UCL	651.4

Suggested UCL to Use

ecommendation Provided only for 95% Confidence Coefficient

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

	A	B	C	D	E	F	G	H	I	J	K	L
82												
83												
84	DRO											
85												
86	**General Statistics**											
87					Total Number of Observations	12					Number of Distinct Observations	12
88											Number of Missing Observations	0
89					Minimum	2830					Mean	16424
90					Maximum	74600					Median	12100
91					SD	18669					Std. Error of Mean	5389
92					Coefficient of Variation	1.137					Skewness	3.228
93												
94	**Normal GOF Test**											
95					Shapiro Wilk Test Statistic	0.512	**Shapiro Wilk GOF Test**					
96					1% Shapiro Wilk Critical Value	0.805	Data Not Normal at 1% Significance Level					
97					Lilliefors Test Statistic	0.432	**Lilliefors GOF Test**					
98					1% Lilliefors Critical Value	0.281	Data Not Normal at 1% Significance Level					
99	Data Not Normal at 1% Significance Level											
100												
101	**Assuming Normal Distribution**											
102	**90% Normal UCL**						**90% UCLs (Adjusted for Skewness)**					
103					90% Student's-t UCL	23772					90% Adjusted-CLT UCL (Chen-1995)	26917
104											90% Modified-t UCL (Johnson-1978)	24609
105												
106	**Gamma GOF Test**											
107					A-D Test Statistic	1.375	**Anderson-Darling Gamma GOF Test**					
108					5% A-D Critical Value	0.743	Data Not Gamma Distributed at 5% Significance Level					
109					K-S Test Statistic	0.34	**Kolmogorov-Smirnov Gamma GOF Test**					
110					5% K-S Critical Value	0.249	Data Not Gamma Distributed at 5% Significance Level					
111	Data Not Gamma Distributed at 5% Significance Level											
112												
113	**Gamma Statistics**											
114					k hat (MLE)	1.783					k star (bias corrected MLE)	1.393
115					Theta hat (MLE)	9211					Theta star (bias corrected MLE)	11791
116					nu hat (MLE)	42.8					nu star (bias corrected)	33.43
117					MLE Mean (bias corrected)	16424					MLE Sd (bias corrected)	13916
118											Approximate Chi Square Value (0.1)	23.47
119					Adjusted Level of Significance	0.0752					Adjusted Chi Square Value	22.48
120												
121	**Assuming Gamma Distribution**											
122					90% Approximate Gamma UCL	23392					90% Adjusted Gamma UCL	24425
123												
124	**Lognormal GOF Test**											
125					Shapiro Wilk Test Statistic	0.839	**Shapiro Wilk Lognormal GOF Test**					
126					10% Shapiro Wilk Critical Value	0.883	Data Not Lognormal at 10% Significance Level					
127					Lilliefors Test Statistic	0.279	**Lilliefors Lognormal GOF Test**					
128					10% Lilliefors Critical Value	0.223	Data Not Lognormal at 10% Significance Level					
129	Data Not Lognormal at 10% Significance Level											
130												
131	**Lognormal Statistics**											
132					Minimum of Logged Data	7.948					Mean of logged Data	9.401
133					Maximum of Logged Data	11.22					SD of logged Data	0.738
134												
135	**Assuming Lognormal Distribution**											
136					90% H-UCL	23591					90% Chebyshev (MVUE) UCL	25770
137					95% Chebyshev (MVUE) UCL	30445					97.5% Chebyshev (MVUE) UCL	36933
138					99% Chebyshev (MVUE) UCL	49677						
139												
140	**Nonparametric Distribution Free UCL Statistics**											
141	Data do not follow a Discernible Distribution											
142												
143	**Nonparametric Distribution Free UCLs**											
144					90% CLT UCL	23331					90% BCA Bootstrap UCL	26605
145					90% Standard Bootstrap UCL	22958					90% Bootstrap-t UCL	47897
146					90% Hall's Bootstrap UCL	67165					90% Percentile Bootstrap UCL	22532
147					90% Chebyshev(Mean, Sd) UCL	32592					95% Chebyshev(Mean, Sd) UCL	39915
148					97.5% Chebyshev(Mean, Sd) UCL	50080					99% Chebyshev(Mean, Sd) UCL	70046
149												
150	**Suggested UCL to Use**											
151					ecommendation Provided only for 95% Confidence Coefficient							
152												
153	The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.											
154	Please verify the data were collected from random locations.											
155	If the data were collected using judgmental or other non-random methods,											
156	then contact a statistician to correctly calculate UCLs.											
157												
158												

ORO			
General Statistics			
Total Number of Observations	12	Number of Distinct Observations	12
		Number of Missing Observations	0
Minimum	5600	Mean	21783
Maximum	69500	Median	17700
SD	15896	Std. Error of Mean	4589
Coefficient of Variation	0.73	Skewness	2.795
Normal GOF Test			
Shapiro Wilk Test Statistic	0.646	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.805	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.339	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.281	Data Not Normal at 1% Significance Level	
Data Not Normal at 1% Significance Level			
Assuming Normal Distribution			
90% Normal UCL		**90% UCLs (Adjusted for Skewness)**	
90% Student's-t UCL	28040	90% Adjusted-CLT UCL (Chen-1995)	30309
		90% Modified-t UCL (Johnson-1978)	28657
Gamma GOF Test			
A-D Test Statistic	0.916	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.738	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.25	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.247	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	3.213	k star (bias corrected MLE)	2.465
Theta hat (MLE)	6780	Theta star (bias corrected MLE)	8837
nu hat (MLE)	77.1	nu star (bias corrected)	59.16
MLE Mean (bias corrected)	21783	MLE Sd (bias corrected)	13874
		Approximate Chi Square Value (0.1)	45.72
Adjusted Level of Significance	0.0752	Adjusted Chi Square Value	44.3
Assuming Gamma Distribution			
90% Approximate Gamma UCL	28188	90% Adjusted Gamma UCL	29088
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.879	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.883	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.218	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.223	Data appear Lognormal at 10% Significance Level	
Data appear Approximate Lognormal at 10% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	8.631	Mean of logged Data	9.825
Maximum of Logged Data	11.15	SD of logged Data	0.571
Assuming Lognormal Distribution			
90% H-UCL	28789	90% Chebyshev (MVUE) UCL	32351
95% Chebyshev (MVUE) UCL	37295	97.5% Chebyshev (MVUE) UCL	44156
99% Chebyshev (MVUE) UCL	57634		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution			
Nonparametric Distribution Free UCLs			
90% CLT UCL	27664	90% BCA Bootstrap UCL	29775
90% Standard Bootstrap UCL	27382	90% Bootstrap-t UCL	37826
90% Hall's Bootstrap UCL	60680	90% Percentile Bootstrap UCL	27308
90% Chebyshev(Mean, Sd) UCL	35550	95% Chebyshev(Mean, Sd) UCL	41785
97.5% Chebyshev(Mean, Sd) UCL	50440	99% Chebyshev(Mean, Sd) UCL	67441
Suggested UCL to Use			
ecommendation Provided only for 95% Confidence Coefficient			

	A	B	C	D	E	F	G	H	I	J	K	L
229	Ba											
230												
231	**General Statistics**											
232	Total Number of Observations					12	Number of Distinct Observations					12
233							Number of Missing Observations					0
234	Minimum					0.363	Mean					0.688
235	Maximum					0.884	Median					0.728
236	SD					0.16	Std. Error of Mean					0.0462
237	Coefficient of Variation					0.233	Skewness					-0.691
238												
239	**Normal GOF Test**											
240	Shapiro Wilk Test Statistic					0.942	**Shapiro Wilk GOF Test**					
241	1% Shapiro Wilk Critical Value					0.805	Data appear Normal at 1% Significance Level					
242	Lilliefors Test Statistic					0.147	**Lilliefors GOF Test**					
243	1% Lilliefors Critical Value					0.281	Data appear Normal at 1% Significance Level					
244	**Data appear Normal at 1% Significance Level**											
245												
246	**Assuming Normal Distribution**											
247	**90% Normal UCL**						**90% UCLs (Adjusted for Skewness)**					
248	90% Student's-t UCL					0.75	90% Adjusted-CLT UCL (Chen-1995)					0.74
249							90% Modified-t UCL (Johnson-1978)					0.749
250												
251	**Gamma GOF Test**											
252	A-D Test Statistic					0.411	**Anderson-Darling Gamma GOF Test**					
253	5% A-D Critical Value					0.731	Detected data appear Gamma Distributed at 5% Significance Level					
254	K-S Test Statistic					0.175	**Kolmogorov-Smirnov Gamma GOF Test**					
255	5% K-S Critical Value					0.245	Detected data appear Gamma Distributed at 5% Significance Level					
256	**Detected data appear Gamma Distributed at 5% Significance Level**											
257												
258	**Gamma Statistics**											
259	k hat (MLE)					17.3	k star (bias corrected MLE)					13.03
260	Theta hat (MLE)					0.0397	Theta star (bias corrected MLE)					0.0528
261	nu hat (MLE)					415.2	nu star (bias corrected)					312.7
262	MLE Mean (bias corrected)					0.688	MLE Sd (bias corrected)					0.19
263							Approximate Chi Square Value (0.1)					281.1
264	Adjusted Level of Significance					0.0752	Adjusted Chi Square Value					277.5
265												
266	**Assuming Gamma Distribution**											
267	90% Approximate Gamma UCL					0.765	90% Adjusted Gamma UCL					0.775
268												
269	**Lognormal GOF Test**											
270	Shapiro Wilk Test Statistic					0.894	**Shapiro Wilk Lognormal GOF Test**					
271	10% Shapiro Wilk Critical Value					0.883	Data appear Lognormal at 10% Significance Level					
272	Lilliefors Test Statistic					0.182	**Lilliefors Lognormal GOF Test**					
273	10% Lilliefors Critical Value					0.223	Data appear Lognormal at 10% Significance Level					
274	**Data appear Lognormal at 10% Significance Level**											
275												
276	**Lognormal Statistics**											
277	Minimum of Logged Data					-1.013	Mean of logged Data					-0.404
278	Maximum of Logged Data					-0.123	SD of logged Data					0.264
279												
280	**Assuming Lognormal Distribution**											
281	90% H-UCL					0.774	90% Chebyshev (MVUE) UCL					0.848
282	95% Chebyshev (MVUE) UCL					0.92	97.5% Chebyshev (MVUE) UCL					1.019
283	99% Chebyshev (MVUE) UCL					1.215						
284												
285	**Nonparametric Distribution Free UCL Statistics**											
286	Data appear to follow a Discernible Distribution											
287												
288	**Nonparametric Distribution Free UCLs**											
289	90% CLT UCL					0.747	90% BCA Bootstrap UCL					0.737
290	90% Standard Bootstrap UCL					0.745	90% Bootstrap-t UCL					0.744
291	90% Hall's Bootstrap UCL					0.74	90% Percentile Bootstrap UCL					0.744
292	90% Chebyshev(Mean, Sd) UCL					0.826	95% Chebyshev(Mean, Sd) UCL					0.889
293	97.5% Chebyshev(Mean, Sd) UCL					0.976	99% Chebyshev(Mean, Sd) UCL					1.147
294												
295	**Suggested UCL to Use**											
296	ecommendation Provided only for 95% Confidence Coefficient											
297												
298	Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be											
299	reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.											
300												
301												

	A	B	C	D	E	F	G	H	I	J	K	L
302	Cd											
303												
304	**General Statistics**											
305	Total Number of Observations					12	Number of Distinct Observations					11
306							Number of Missing Observations					0
307	Minimum					0.05	Mean					0.159
308	Maximum					0.361	Median					0.148
309	SD					0.0807	Std. Error of Mean					0.0233
310	Coefficient of Variation					0.507	Skewness					1.172
311												
312	**Normal GOF Test**											
313	Shapiro Wilk Test Statistic					0.877	**Shapiro Wilk GOF Test**					
314	1% Shapiro Wilk Critical Value					0.805	Data appear Normal at 1% Significance Level					
315	Lilliefors Test Statistic					0.198	**Lilliefors GOF Test**					
316	1% Lilliefors Critical Value					0.281	Data appear Normal at 1% Significance Level					
317	Data appear Normal at 1% Significance Level											
318												
319	**Assuming Normal Distribution**											
320	**90% Normal UCL**						**90% UCLs (Adjusted for Skewness)**					
321	90% Student's-t UCL					0.191	90% Adjusted-CLT UCL (Chen-1995)					0.195
322							90% Modified-t UCL (Johnson-1978)					0.192
323												
324	**Gamma GOF Test**											
325	A-D Test Statistic					0.585	**Anderson-Darling Gamma GOF Test**					
326	5% A-D Critical Value					0.736	Detected data appear Gamma Distributed at 5% Significance Level					
327	K-S Test Statistic					0.221	**Kolmogorov-Smirnov Gamma GOF Test**					
328	5% K-S Critical Value					0.246	Detected data appear Gamma Distributed at 5% Significance Level					
329	Detected data appear Gamma Distributed at 5% Significance Level											
330												
331	**Gamma Statistics**											
332	k hat (MLE)					4.069	k star (bias corrected MLE)					3.107
333	Theta hat (MLE)					0.0391	Theta star (bias corrected MLE)					0.0513
334	nu hat (MLE)					97.65	nu star (bias corrected)					74.57
335	MLE Mean (bias corrected)					0.159	MLE Sd (bias corrected)					0.0903
336							Approximate Chi Square Value (0.1)					59.41
337	Adjusted Level of Significance					0.0752	Adjusted Chi Square Value					57.79
338												
339	**Assuming Gamma Distribution**											
340	90% Approximate Gamma UCL					0.2	90% Adjusted Gamma UCL					0.206
341												
342	**Lognormal GOF Test**											
343	Shapiro Wilk Test Statistic					0.879	**Shapiro Wilk Lognormal GOF Test**					
344	10% Shapiro Wilk Critical Value					0.883	Data Not Lognormal at 10% Significance Level					
345	Lilliefors Test Statistic					0.254	**Lilliefors Lognormal GOF Test**					
346	10% Lilliefors Critical Value					0.223	Data Not Lognormal at 10% Significance Level					
347	Data Not Lognormal at 10% Significance Level											
348												
349	**Lognormal Statistics**											
350	Minimum of Logged Data					-2.996	Mean of logged Data					-1.965
351	Maximum of Logged Data					-1.019	SD of logged Data					0.56
352												
353	**Assuming Lognormal Distribution**											
354	90% H-UCL					0.215	90% Chebyshev (MVUE) UCL					0.242
355	95% Chebyshev (MVUE) UCL					0.278	97.5% Chebyshev (MVUE) UCL					0.329
356	99% Chebyshev (MVUE) UCL					0.429						
357												
358	**Nonparametric Distribution Free UCL Statistics**											
359	Data appear to follow a Discernible Distribution											
360												
361	**Nonparametric Distribution Free UCLs**											
362	90% CLT UCL					0.189	90% BCA Bootstrap UCL					0.191
363	90% Standard Bootstrap UCL					0.188	90% Bootstrap-t UCL					0.199
364	90% Hall's Bootstrap UCL					0.223	90% Percentile Bootstrap UCL					0.188
365	90% Chebyshev(Mean, Sd) UCL					0.229	95% Chebyshev(Mean, Sd) UCL					0.261
366	97.5% Chebyshev(Mean, Sd) UCL					0.305	99% Chebyshev(Mean, Sd) UCL					0.391
367												
368	**Suggested UCL to Use**											
369	ecommendation Provided only for 95% Confidence Coefficient											
370												
371												

372	Pb			
373				
374	**General Statistics**			
375	Total Number of Observations	12	Number of Distinct Observations	11
376			Number of Missing Observations	0
377	Minimum	0.05	Mean	0.741
378	Maximum	3.58	Median	0.382
379	SD	0.984	Std. Error of Mean	0.284
380	Coefficient of Variation	1.327	Skewness	2.523
381				
382	**Normal GOF Test**			
383	Shapiro Wilk Test Statistic	0.678	**Shapiro Wilk GOF Test**	
384	1% Shapiro Wilk Critical Value	0.805	Data Not Normal at 1% Significance Level	
385	Lilliefors Test Statistic	0.288	**Lilliefors GOF Test**	
386	1% Lilliefors Critical Value	0.281	Data Not Normal at 1% Significance Level	
387	**Data Not Normal at 1% Significance Level**			
388				
389	**Assuming Normal Distribution**			
390	**90% Normal UCL**		**90% UCLs (Adjusted for Skewness)**	
391	90% Student's-t UCL	1.129	90% Adjusted-CLT UCL (Chen-1995)	1.253
392			90% Modified-t UCL (Johnson-1978)	1.163
393				
394	**Gamma GOF Test**			
395	A-D Test Statistic	0.363	**Anderson-Darling Gamma GOF Test**	
396	5% A-D Critical Value	0.761	Detected data appear Gamma Distributed at 5% Significance Level	
397	K-S Test Statistic	0.2	**Kolmogorov-Smirnov Gamma GOF Test**	
398	5% K-S Critical Value	0.254	Detected data appear Gamma Distributed at 5% Significance Level	
399	**Detected data appear Gamma Distributed at 5% Significance Level**			
400				
401	**Gamma Statistics**			
402	k hat (MLE)	0.882	k star (bias corrected MLE)	0.717
403	Theta hat (MLE)	0.841	Theta star (bias corrected MLE)	1.034
404	nu hat (MLE)	21.17	nu star (bias corrected)	17.21
405	MLE Mean (bias corrected)	0.741	MLE Sd (bias corrected)	0.876
406			Approximate Chi Square Value (0.1)	10.25
407	Adjusted Level of Significance	0.0752	Adjusted Chi Square Value	9.615
408				
409	**Assuming Gamma Distribution**			
410	90% Approximate Gamma UCL	1.245	90% Adjusted Gamma UCL	1.327
411				
412	**Lognormal GOF Test**			
413	Shapiro Wilk Test Statistic	0.957	**Shapiro Wilk Lognormal GOF Test**	
414	10% Shapiro Wilk Critical Value	0.883	Data appear Lognormal at 10% Significance Level	
415	Lilliefors Test Statistic	0.144	**Lilliefors Lognormal GOF Test**	
416	10% Lilliefors Critical Value	0.223	Data appear Lognormal at 10% Significance Level	
417	**Data appear Lognormal at 10% Significance Level**			
418				
419	**Lognormal Statistics**			
420	Minimum of Logged Data	-2.996	Mean of logged Data	-0.964
421	Maximum of Logged Data	1.275	SD of logged Data	1.26
422				
423	**Assuming Lognormal Distribution**			
424	90% H-UCL	2.101	90% Chebyshev (MVUE) UCL	1.664
425	95% Chebyshev (MVUE) UCL	2.073	97.5% Chebyshev (MVUE) UCL	2.64
426	99% Chebyshev (MVUE) UCL	3.755		
427				
428	**Nonparametric Distribution Free UCL Statistics**			
429	**Data appear to follow a Discernible Distribution**			
430				
431	**Nonparametric Distribution Free UCLs**			
432	90% CLT UCL	1.105	90% BCA Bootstrap UCL	1.246
433	90% Standard Bootstrap UCL	1.089	90% Bootstrap-t UCL	1.597
434	90% Hall's Bootstrap UCL	2.721	90% Percentile Bootstrap UCL	1.096
435	90% Chebyshev(Mean, Sd) UCL	1.593	95% Chebyshev(Mean, Sd) UCL	1.979
436	97.5% Chebyshev(Mean, Sd) UCL	2.515	99% Chebyshev(Mean, Sd) UCL	3.567
437				
438	**Suggested UCL to Use**			
439	ecommendation Provided only for 95% Confidence Coefficient			
440				
441	**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**			
442	**Please verify the data were collected from random locations.**			
443	**If the data were collected using judgmental or other non-random methods,**			
444	**then contact a statistician to correctly calculate UCLs.**			
445				

GRO	DRO	ORO	Ba	Cd	Pb
34.4	**11,100**	**16,000**	**0.713**	**0.144**	**0.356**
37.3	2,830	5,600	**0.363**	0.05	0.05
43.3	**7,120**	**13,300**	**0.504**	0.05	0.05
88.2	**8,540**	**15,000**	**0.535**	**0.113**	**0.173**
172	**11,000**	**15,400**	**0.625**	**0.141**	**0.234**
183	**11,200**	**17,600**	**0.633**	**0.145**	**0.355**
270	**13,000**	**17,800**	**0.742**	**0.151**	**0.408**
280	**13,300**	**20,300**	**0.748**	**0.173**	**0.438**
357	**14,100**	**22,600**	**0.798**	**0.182**	**0.733**
377	**14,600**	**23,400**	**0.848**	**0.195**	**1.19**
411	**15,700**	**24,900**	**0.857**	**0.206**	**1.33**
418	**74,600**	**69,500**	**0.884**	**0.361**	**3.58**

	A	B	C	D	E	F	G	H	I	J	K
1					Outlier Tests for Selected Uncensored Variables						
2				**User Selected Options**							
3			Date/Time of Computation	ProUCL 5.2 5/19/2025 5:36:55 PM							
4				From File	ProUCL_PCB Concentrations.xls						
5				Full Precision	OFF						
6											
7											
8			**Dixon's Outlier Test for PCBs**								
9											
10	Number of Observations = 12										
11	10% critical value: 0.49										
12	5% critical value: 0.546										
13	1% critical value: 0.642										
14											
15	**1. Observation Value 201 is a Potential Outlier (Upper Tail)?**										
16											
17	Test Statistic: 0.898										
18											
19	For 10% significance level, 201 is an outlier.										
20	For 5% significance level, 201 is an outlier.										
21	For 1% significance level, 201 is an outlier.										
22											
23	**2. Observation Value 4.91 is a Potential Outlier (Lower Tail)?**										
24											
25	Test Statistic: 0.057										
26											
27	For 10% significance level, 4.91 is not an outlier.										
28	For 5% significance level, 4.91 is not an outlier.										
29	For 1% significance level, 4.91 is not an outlier.										
30											

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Uncensored Full Data Sets											
2												
3			User Selected Options									
4			Date/Time of Computation	ProUCL 5.2 5/20/2025 9:46:27 AM								
5			From File	ProUCL_PCB Concentrations.xls								
6			Full Precision	OFF								
7			Confidence Coefficient	90%								
8			Number of Bootstrap Operations	2000								
9												
10												
11	PCB											
12												
13	**General Statistics**											
14					Total Number of Observations	11					Number of Distinct Observations	11
15											Number of Missing Observations	0
16					Minimum	4.91					Mean	14.24
17					Maximum	43.14					Median	10.54
18					SD	11.2					Std. Error of Mean	3.378
19					Coefficient of Variation	0.787					Skewness	2.096
20												
21	**Normal GOF Test**											
22					Shapiro Wilk Test Statistic	0.735	**Shapiro Wilk GOF Test**					
23					1% Shapiro Wilk Critical Value	0.792	Data Not Normal at 1% Significance Level					
24					Lilliefors Test Statistic	0.321	**Lilliefors GOF Test**					
25					1% Lilliefors Critical Value	0.291	Data Not Normal at 1% Significance Level					
26	Data Not Normal at 1% Significance Level											
27												
28	**Assuming Normal Distribution**											
29	**90% Normal UCL**						**90% UCLs (Adjusted for Skewness)**					
30					90% Student's-t UCL	18.87					90% Adjusted-CLT UCL (Chen-1995)	20.09
31											90% Modified-t UCL (Johnson-1978)	19.23
32												
33	**Gamma GOF Test**											
34					A-D Test Statistic	0.637	**Anderson-Darling Gamma GOF Test**					
35					5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level					
36					K-S Test Statistic	0.239	**Kolmogorov-Smirnov Gamma GOF Test**					
37					5% K-S Critical Value	0.258	Detected data appear Gamma Distributed at 5% Significance Level					
38	Detected data appear Gamma Distributed at 5% Significance Level											
39												
40	**Gamma Statistics**											
41					k hat (MLE)	2.633					k star (bias corrected MLE)	1.976
42					Theta hat (MLE)	5.406					Theta star (bias corrected MLE)	7.206
43					nu hat (MLE)	57.93					nu star (bias corrected)	43.47
44					MLE Mean (bias corrected)	14.24					MLE Sd (bias corrected)	10.13
45											Approximate Chi Square Value (0.1)	32.03
46					Adjusted Level of Significance	0.0738					Adjusted Chi Square Value	30.78
47												
48	**Assuming Gamma Distribution**											
49					90% Approximate Gamma UCL	19.32					90% Adjusted Gamma UCL	20.1
50												
51	**Lognormal GOF Test**											
52					Shapiro Wilk Test Statistic	0.931	**Shapiro Wilk Lognormal GOF Test**					
53					10% Shapiro Wilk Critical Value	0.876	Data appear Lognormal at 10% Significance Level					
54					Lilliefors Test Statistic	0.194	**Lilliefors Lognormal GOF Test**					
55					10% Lilliefors Critical Value	0.231	Data appear Lognormal at 10% Significance Level					
56	Data appear Lognormal at 10% Significance Level											
57												
58	**Lognormal Statistics**											
59					Minimum of Logged Data	1.591					Mean of logged Data	2.454
60					Maximum of Logged Data	3.764					SD of logged Data	0.622
61												
62	**Assuming Lognormal Distribution**											
63					90% H-UCL	19.69					90% Chebyshev (MVUE) UCL	21.86
64					95% Chebyshev (MVUE) UCL	25.49					97.5% Chebyshev (MVUE) UCL	30.53
65					99% Chebyshev (MVUE) UCL	40.43						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	Data appear to follow a Discernible Distribution											
69												
70	**Nonparametric Distribution Free UCLs**											
71					90% CLT UCL	18.57					90% BCA Bootstrap UCL	20.09
72					90% Standard Bootstrap UCL	18.37					90% Bootstrap-t UCL	26.88
73					90% Hall's Bootstrap UCL	47.81					90% Percentile Bootstrap UCL	18.57
74					90% Chebyshev(Mean, Sd) UCL	24.37					95% Chebyshev(Mean, Sd) UCL	28.96
75					97.5% Chebyshev(Mean, Sd) UCL	35.33					99% Chebyshev(Mean, Sd) UCL	47.85
76												
77	**Suggested UCL to Use**											
78	ecommendation Provided only for 95% Confidence Coefficient											

PCBs
4.91
6.82
7.07
9.05
9.35
10.54
11.26
13.69
14.17
26.6
43.14
~~201~~