



July 8, 2021

To: Benjamin McPherson (NYSDEC)

From: Todd Waldrop (Inventum)

CC: Jon Williams (Riverview); John Yensan (OSC); Marc Romanowski (Rupp Baase); John Black, P.E. and James Edwards (Inventum)

RE: Surface Water System Maintenance, IRM Work Plan
Concrete-lined Settling Ponds
Riverview Innovation & Technology Campus, Inc.
Brownfield Cleanup Program Site No. C915353
Town of Tonawanda, New York

Inventum Engineering, P.C. (Engineering), on behalf of Riverview Innovation & Technology Campus, Inc. (Riverview), is submitting this IRM Work Plan for the final tasks planned to remove the last residuals from Tonawanda Coke Corporation (TCC) remaining in the process area Site Storm Water Control Structures under the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) for the Riverview Innovation & Technology Campus Site (#C915353) located at 3875 River Road, Tonawanda, New York. While residuals from TCC remain on the property, to the extent practicable, they have been removed from the storm sewers and the Mansion Sump upgradient of the concrete-lined settling ponds.

Background and Purpose

The purpose of this IRM work plan is to remove the accumulated residual sediment (Tables 1 and 2) in the concrete-lined settling ponds which are the final treatment components before discharge through Outfall #001. Completion of the cleaning and maintenance IRM work in the North Storm Sewer, the Box Culvert and the Mansion Sump upstream of this system was required to ensure this IRM could be effectively completed. If the upstream potential sources had not been removed, there would be no way to isolate the effect of the pond cleaning on the outfall quality.

Concrete-lined Settling Ponds

The concrete-lined settling ponds are a multi-chamber designed system constructed to retain and allow settling and aerobic biological treatment of surface water discharges from the north section of the property (AOIs 1, 2, and 3). Underground, east of the ponds is an influent manifold. No as-built drawing of the manifold has been found, but the preliminary design drawing and the valves that are visible suggest a 3-leg manifold into the settling ponds leading to the north pond, south pond, and directly to the chase. During a previous IRM, efforts to confirm the flow configuration of the manifold

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Suite 202
Herndon, Virginia 20170*

were completed. The north valve was closed, and the center and south valve were opened. Opening and closing the valves sequentially produced changes in water level in the Mansion Sump and flow from each pipeline outlet, demonstrating the presence and effective operation of the manifold that is required for this IRM Work Plan.

The concrete pads forming the east end of the concrete-lined settling ponds are ramps to allow access for cleaning. Sufficient sediment has accumulated along the base of the ramps to support cattail growth.

The flow from the North-South Storm Sewer currently discharges to into a small stilling chamber, then over a concrete weir, and then into the north concrete lined settling pond. The stilling chamber is full of sediment. The flow then slowly migrates to the west, allowing settling of suspended solids. The effectiveness of the pond is evident as there is approximately 4 feet of sediment in the north pond. The flow then progresses over a series of v-notch weirs to the west end of the south pond.

The flow in the south pond then flows east. Approximately 25-gallons per minute is recirculated to the North Pond by a pump. The recirculated flow accomplishes two benefits, it increases the overall retention time, and the recirculated flow is broadcast through the air increasing the dissolved oxygen content of the water. The south pond has been effective as a settling pond also, nearly 2-feet of sediment has accumulated in the south pond.

The water by-passing the south to north pond recirculation pump typically would flow east and then over a series of v-notch weirs at the east end of the south concrete lined sedimentation pond into the outfall chase. The flow is interrupted with a pumping and filtration system. The water is now pumped from the south pond, through two bag filters in series and discharged to the chase above the Parshall flume that represents the monitoring point for Outfall #001.

Purpose

The scope of this IRM Work Plan is intended to remove the accumulated sediment from the North and South Concrete-lined Settling Ponds and restore the retention time to optimal condition under which the ponds were designed.

Proposed Scope of Work

Based on the observations of the system, the following recommendations are made, especially if the opportunity to complete the work during the dry summer months is possible:

1. Mobilization
2. Close North Pond Valve Open South Pond Valve
3. Treat Water from North Pond
4. Consolidate Sediment
5. Stabilize Sediment in North Pond
6. Excavate and Dispose North Pond Sediment Offsite
7. Wash North Pond
8. Close South Pond Valve Open North Pond Valve
9. Treat Water from the South Pond



10. Consolidate Sediment
11. Stabilize Sediment in the South Pond
12. Excavate and Dispose South Pond Sediment
13. Wash South Pond
14. Shut Off North Pond By-pass Pump and Clean Discharge Chase While South Pond Fills
15. Demobilize Treatment System
16. Post-Cleaning Testing

Mobilization and Set-up

The mobilization phase of the project will be to ensure the equipment is in place to allow the cleaning to be conducted efficiently. Because the ponds contain significant amounts of sediment, there will be no loss of efficiency during the cleaning process, and in fact, there will be increased treatment. The following will be mobilized to the settling ponds:

- Erosion and Sediment Control Materials;
- Treatment system:
 - 18,000-gallon (nominal) weir tank;
 - Sump pump capable of pumping 75-gallons per minute (GPM);
 - Bag filters (2-in series) 25-micron;
 - Transfer Pump;
 - 2,000- pound Granulated Activated Carbon (GAC) Unit;
 - Connecting and discharge hose
- Excavator with flat bladed bucket;
- Front-end loader;
- Skid-steer; and
- Hand tools required for smaller spaces (weirs and stilling chamber).

The Investigation Derived Waste (IDW) Drums from the Site 109 Remedial Investigation (RI) will be relocated to the northeast corner of the water treatment area (Figure 1). Erosion and sediment controls will be established to protect the Outfall #002 discharge channel and to prevent sediment laden runoff north of the ponds. These are precautions to be taken to prevent sediment transport associated the movement of heavy equipment in and around the settling ponds during the cleaning.

The water treatment area will be established at a location where it is capable of extracting water from the north or south pond and discharge treated water to the discharge chase above Outfall #001.

The upwind Community Air Monitoring Plan (CAMP) station (weather, dust and VOCs) for the BCP Site is generally immediately downwind of the concrete-lined settling ponds. Should the wind direction vary, a second CAMP station (dust and VOCs) will be located downwind of any active materials management in the ponds.

Close North Pond Valve Open South Pond Valve

The manifold east of the settling ponds was designed to allow flow to be directed to each of the ponds or directly to the Outfall #001 discharge chase. The north pond contains the largest amount of sediment and currently provides only 2-feet of surface water retention.



The south pond currently contains 2-feet of freeboard between the water surface and the weir, providing the same duration of retention. During the north pond cleaning, the pool level in the south pond will be raised two feet so the south pond will be capable of providing the equivalent retention time during the north pond cleaning.

The steps necessary to manage the flow during the north pond cleaning include:

- Redirect the discharge from the recirculation/aeration pump to the west end of the south pond;
- Raise the discharge/filtration pump 24-inches;
- Close the north pond discharge gate valve; and
- Open the south pond discharge gate valve.

Treat Water from North Pond

The water in the north pond will not have been retained for the full treatment cycle. The free water in the north pond will be treated through the mobilized treatment system and discharged to the outfall chase above Outfall #001. The water will combine with the filtered discharge from the south pond prior to discharge at Outfall #001.

During the pond cleaning, the sampling frequency for Outfall #001 will be amended to include sampling of the quarterly analytical suite as follows:

- After one day of treated water discharge; and
- After the north pond is initially dewatered.

The treatment system will remain active as the sediments are consolidated and release free liquids.

Consolidate Sediment

The sediment accumulated in the stilling pool, north pond, and on the weir below the catwalk between the ponds (west end) will be consolidated in the west end of the pond and allowed to release free liquids. The estimated volume prior to draining is 15,800-cubic feet (~700-tons). All free liquids will be collected and pumped to the weir tank for treatment. The volume of sediment is expected to decrease as a result of drainage. The consolidation of the sediment is anticipated to require multiple movement utilizing the front-end loader as the consistency stiffens as a result of moisture release. The bench-scale mixing was completed after one week of blending and solidification. The process of moving and consolidating the sediment will continue until the material can be placed in stockpiles without flowing under their own weight.

Stabilize Sediment in North Pond

The sediments in the north stilling pool and north pond will be stabilized with cut-n-dry (Attachment A) a cement/lime kiln dust product. The addition rate of 14.5- percent produced a sample that passed the paint filter test. The sample was tested for disposal profile (Attachment B).

The stabilization at the bench scale required multiple mixing that will be completed in the north pond using the flat bladed excavator. The materials will be mixed and turned over multiple times while adding the cut-n-dry.



Between mixing events the materials will be left exposed to the weather unless a significant precipitation event is forecast. If the weather forecast suggests more than ¼ inch of rain, the materials will be covered with polyethylene sheeting.

Multiple samples will be collected from the pile(s) to confirm, via field tests, that there is no free liquid in the materials.

Excavate and Dispose North Pond Sediment Offsite

The stabilized materials will be excavated and loaded over several days based on the availability of over the road trucking. The total volume may require 30 or more truck loads. The materials will be disposed as solid waste at the Modern or Chafee Landfill. DEC will be notified no less than 5-days before any materials are shipped.

Wash North Pond

Following removal of the stabilized sediment the stilling pool and north pond will be washed with water (no surfactants or detergents will be used) to allow inspection. Prior to washing, the valve to the south pond will be closed for a minimum of one hour. After one hour the valve to the north pond will be opened for 10 minutes to flush any sediment in the end of the pipe. After 10 minutes the valve will be closed, the valve to the south pond will be reopened, and the flush water will be pumped to the weir tank. Washing will be conducted to allow inspection. All wash water will be pumped to the weir tank and treated prior to discharge. As a dry weather contingency, approximately 8,000 gallons of potable water will be discharged into the manhole to the North South Sewer in the parking lot (northwest of the office) from the water truck to provide the desired flow.

The walls and slab of the stilling pool and pond will be inspected and documented with photographs. Any cracks or damaged concrete will be sealed prior to placing the pond back into service.

Close South Pond Valve Open North Pond Valve

The south pond currently contains approximately 2-feet of sediment. Redirecting flow to the north pond will provide more retention time than has been available since soon after TCC built the ponds.

The steps necessary to manage the flow will be:

- Move the recirculation/aeration pump to the north pond and redirect the discharge to the east end of the north pond;
- Move the discharge/filtration pump to the north pond, set 12-inches below the north to south weir;
- Run hoses around the south pond to the filtration system;
- Close the south pond discharge gate valve; and
- Open the north pond discharge gate valve.

Treat Water from the South Pond

The water remaining in the south pond should be fully treated but will be pumped to the weir tank for polishing. During the south pond cleaning, the sampling frequency for Outfall #001 will be amended to include sampling of the quarterly analytical suite as follows:

- After one day of south pond treated water discharge; and



- After the south pond is initially dewatered.

The treatment system will remain active as the sediments are consolidated and release free liquids.

Consolidate Sediment

The sediment accumulated in the south pond will be consolidated in the west end of the pond and allowed to release free liquids. The estimated volume after draining is 5,300-cubic feet (~300-tons). All free liquids will be collected and pumped to the weir tank for treatment. The consolidation of the sediment is anticipated to require multiple movement utilizing the front-end loader as the consistency stiffens as moisture is released. The process of moving and consolidating the sediment will continue until the material can be placed in stockpiles without flowing under their own weight.

Stabilize Sediment in South Pond

The sediments in the south stilling pool, south pond, and under the catwalk over the south side weir will be stabilized with cut-n-dry (Attachment A) a cement/lime kiln dust product. The addition rate of 14.5 percent produced a sample that passed the paint filter test.

The stabilization at the bench scale required multiple mixing that will be completed in the south pond using the flat bladed excavator. The materials will be mixed and turned over multiple times while adding the cut-n-dry. The lower quantity in the south pond may allow stabilization to proceed more quickly.

Between mixing events the materials will be left exposed to the weather unless a significant precipitation event is forecast. If the weather forecast suggests more than ¼ inch of rain, the materials will be covered with polyethylene sheeting.

Multiple samples will be collected from the pile(s) to confirm via field tests that there is no free liquid in the materials.

Excavate and Dispose South Pond Sediment Offsite

The stabilized materials will be excavated and loaded over several days based on the availability of over the road trucking. The total volume may require 14 or more truck loads. The materials will be disposed as solid waste at the Modern or Chafee Landfill. DEC will be notified no less than 5-days before any materials are shipped.

Wash South Pond

Following removal of the stabilized sediment the stilling pool and south pond will be washed to allow inspection. Prior to washing, the valve to the north pond will be closed for a minimum of one hour. After one hour the valve to the south pond will be opened for 10 minutes to flush any sediment in the end of the pipe. After 10 minutes the valve will be closed, the valve to the north pond will be reopened, and the flush water will be pumped to the weir tank. Washing will be conducted to allow inspection. All wash water will be pumped to the weir tank and treated prior to discharge. As a dry weather contingency, approximately 8,000 gallons of potable water will be discharged into the manhole to the North South Sewer in the parking lot (northwest of the office) from the water truck to provide the desired flow.



The walls and slab of the stilling pool and pond will be inspected and documented with photographs. Any cracks or damaged concrete will be sealed prior to placing the pond back into service.

Shut Off North Pond By-pass Pump and Clean Discharge Chase While South Pond Fills

Following cleaning of the south pond, the normal treatment cycle will be reestablished by:

- Treating the water in the weir tank to create capacity for ~10,000 gallons of washing fluids;
- Move the recirculation/aeration pump to the South pond and direct the discharge to the east end of the north pond. The pump can be set within 6-inches of the bottom of the south pond to maximize recirculation and aeration of water in the system; and
- Move the discharge/filtration pump to the south pond, set 24-inches below the south to discharge chase weir.

The south pond will fill in 12-hours to 36-hours. During that time, no water will discharge to Outfall #001. The discharge chase shall be cleaned by:

- The water treatment system pump shall be placed downstream of the Outfall #001 Weir;
- Sandbags shall be used to create a sump for the pump;
- The chase walls and slab shall be washed to remove all loose sediment;
- The chase walls, slab, and flume shall be inspected and photographed; and
- The washing fluid and sediment shall be pumped to the weir tank for treatment after cleaning.

Demobilize Treatment System

Following cleaning of the discharge chase, the water in the weir tank will be treated and discharged to the north pond. The system will be deconstructed by removing the sediment and bag filters. The sediment from the weir tank will be stabilized with cut-n-dry and the filters will be disposed with the stabilized sediment at Modern Landfill or Chaffee Landfill

Post-Cleaning Testing

The pond system will be allowed to come into equilibrium for two-months. During this period, the ongoing SWPPP sampling will be conducted but the full benefit of the cleaning is not expected until the microbial population and dissolved oxygen levels are reestablished. After two-months the water from the south pond near the weir will be sampled and tested to determine if it meets the Action Levels in the SWPPP. If the south pond water sample meets the Action Levels, the by-pass pump and filters will be taken offline, and the full quarterly sampling suite will be collected at Outfall #001.

Following receipt of those sample results the Construction Completion Report (CPR) for the pond cleaning will be submitted with recommendations for restoration of the operation maintenance and monitoring of Outfall #001.



G:\My Drive\Inventum\Project Files\Tonawanda\Work Plans And Site Management Plans\BCP Task
Wps\Surface Water Sewer IRM\Phase 3 - Concrete Lined Settling Ponds\Surface Water System
Maintenance_Concrete-Lined Settling Pond IRM Work Plan _ MASTER.Docx



Tables

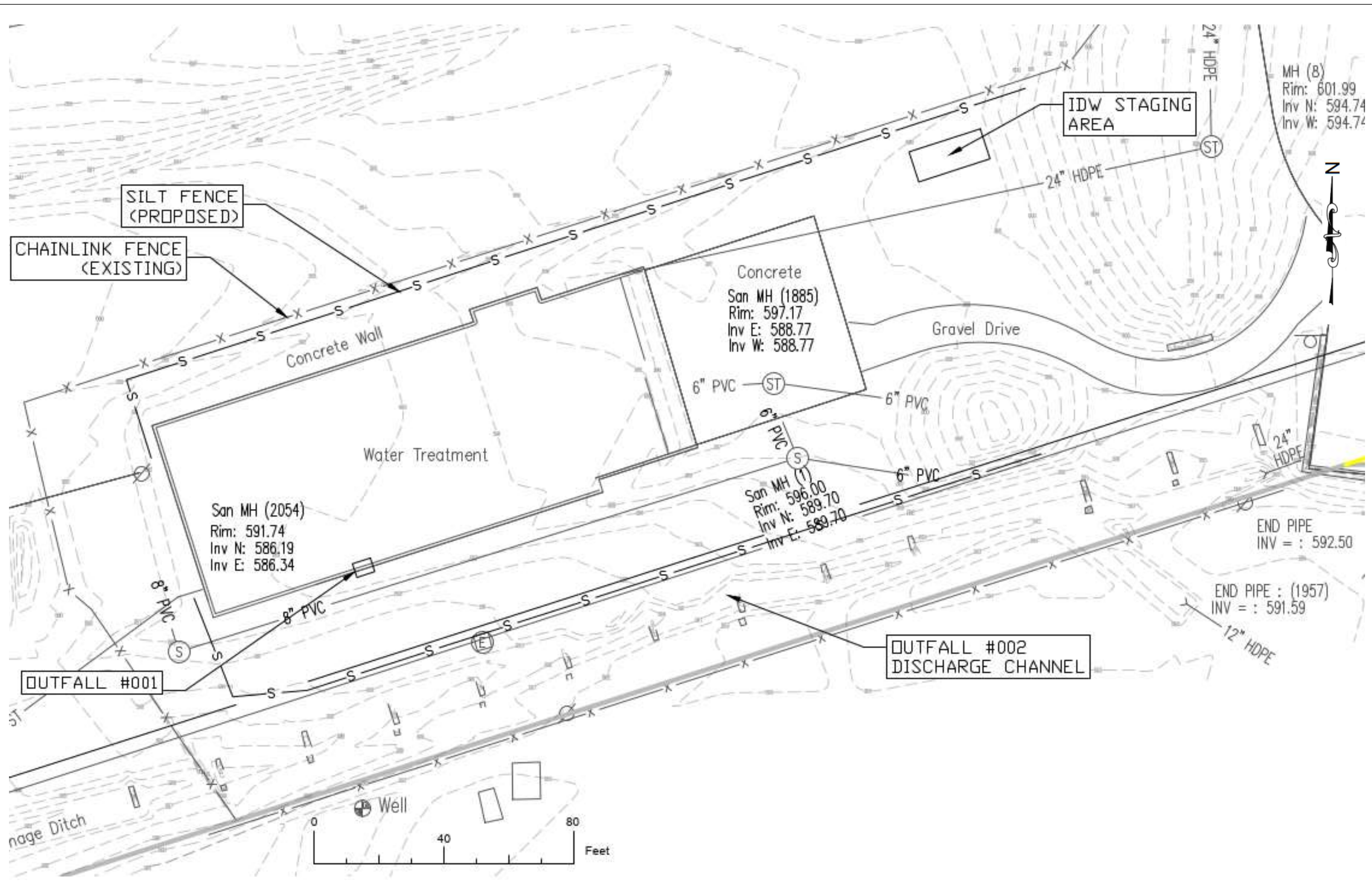


Table 1
 Estimated Volume of Sediment and Water
 Surface Water System IRM
 Concrete Lined Settling Ponds
 Riverview Innovation Technology Campus, Inc.
 Town of Tonawanda, New York

		North Pond		South Pond	
		Sediment	Water	Sediment	Water
		Feet	Feet	Feet	Feet
Measurements March 17, 2021					
	SE Corner	4.5	2	0.83	2.83
	North Center	3.5	3	1.17	2.50
	North West Corner	2.5	4	0.83	2.83
	Southwest Corner	1	5.5	0.50	3.17
	South Center	2.5	4		
	Southeast	3.5	3		
	Average Thickness	3	4	1	3
					Rounded up to a whole increment
Area	5250				Each Pond is approximately 35-foot wide by 150 feet long
Sediment					
Estimated	CF	15800		5300	
Volume	Tons	700		300	Assuming 85 PCF
Water					
Estimated	Gallons		158000		118000
Volume					

Figure





DRAWING BY	CHECKED	APPROVED

MOBILIZATION: CONCRETE LINED
SETTLING PONDS IRM WORK PLAN

INVENTUM ENGINEERING
481 CARLISLE DRIVE
SUITE 202
HERNDON, VIRGINIA 20170

FIGURE 1
DRAWING NUMBER

B

Attachment A

Stabilization Agent



Shepherd Materials Management LLC, 56 Central Avenue, Ravena, NY 12143 (518) 756-1964 www.shepmaterials.com

Cut-N-Dry®

DRYING AGENTS FOR STABILIZING SHALE DRILL CUTTINGS

Shepherd provides select drying agents to gas well sites for stabilization of shale drill cuttings. We ship materials direct to well sites (source-to-site), or from our storage/distribution locations. Our storage/distribution capabilities enable us to accommodate on demand supply needs and prepare product blends designed to meet site-specific requirements. Shepherd personnel have been providing superior service to clients throughout the Northeast US for over 15 years and servicing natural gas development projects since 2009.

Why Shepherd drying agents?

DEMONSTRATED EFFECTIVENESS (SAVE TIME AND MONEY)

Drill site contractors have found that Shepherd products are superior to conventional wood-based drying agents.

USES:

- Drill cuttings stabilization/remediation
- Access road stabilization
- Site prep/stabilization
- Waste drill casing grout/concrete stabilization

BENEFITS:

- Reduced drying agent volumes needed
- Reduced drying/mixing time (i.e., reduced labor costs)
- Reduced site truck traffic
- Reduced volume of solidified material to landfill (i.e., reduced transportation and disposal costs)

TRANSPORTATION OPTIONS

Shepherd drying agents are shipped directly to well sites from our sources of material supply, or from our local designated storage/distribution facilities. Our multiple distribution points enable us to offer convenient access and quick response for emergency needs. Customer pick up or delivery can be arranged in:

- Bulk pneumatic trailers
- Bulk dump trailers
- Triaxles
- Rolloffs
- Supersacks

What materials are available?

Material	Cut-N-Dry® 100	Cut-N-Dry®	Cut-N-Dry® Blends
Description	Calcium Oxide (CaO)	Partially processed cement/lime – will not set hard like concrete	Blends of quicklime/kiln dust products
CaO Content	> 90%	Up to 30%	10% – 90%
Scale of exothermic reaction when mixed with wet cuttings	Significant	Minor	Medium to Significant
Absorptive?	Yes	Yes	Yes
How quickly does stiffening of treated cuttings initiate?	Immediate	Quickly	Per customer's specification
Neutralization potential	Excellent	Excellent	Excellent
Approved at PA, NY, OH, and WV landfills? Shepherd's drying agents have a pH of less than 12.5. Drill cuttings treated properly with these products will not be rejected at the landfill for high pH or free liquids.	Yes	Yes	Yes

Where can I get more information?

Leo Palmateer
(518) 567-5634
leop@shepmaterials.com

Michael Luybli
(610) 216-1658
mluybli@cycle4ward.com

Dave Goldman
(610) 657-4129
dgoldman@cycle4ward.com

"For the highest quality drying agents and most reliable service, it's 'cut-n-dry'....choose Shepherd Materials!"



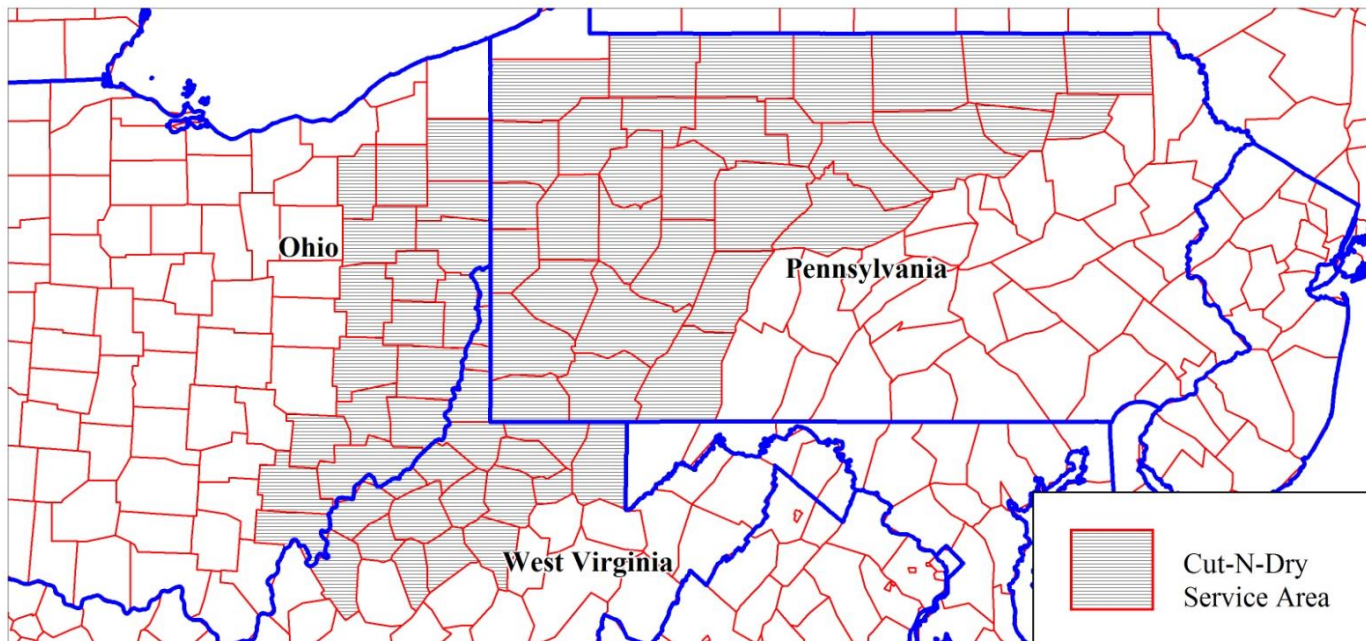
Shepherd Materials Management LLC, 56 Central Avenue, Ravenna, NY 12143 (518) 756-1964 www.shepmaterials.com

Cut-N-Dry®

OIL & GAS CUSTOMER SUPPLY LIST

- | | |
|--|---|
| <ul style="list-style-type: none">• ANADARKO• ANTERO RESOURCES• CAMPBELL OIL & GAS• CHESAPEAKE APPALACHIA• CHIEF OIL & GAS• CARRIZO OIL & GAS• CABOT OIL & GAS• CNX GAS CO.• EQT• EXCO RESOURCES• GASTAR EXPLORATION• GULFPORT ENERGY | <ul style="list-style-type: none">• H.A.D. DRILLING• HALCON RESOURCES• NOBLE ENERGY• PDC ENERGY• RANGE RESOURCES• REX ENERGY• SENECA RESOURCE CORP• SOUTHWESTERN ENERGY• STATOIL• TRIAD HUNTER, LLC• TRIANA ENERGY• WPX ENERGY |
|--|---|

Cut-N-Dry® Service Area



"For the highest quality drying agents and most reliable service, it's 'cut-n-dry'....choose Shepherd Materials!"

Attachment B
Laboratory Report
Stabilized Sediment





Analytical Report For
Inventum Engineering, P.C.

For Lab Project ID

211053

Referencing

Riverview

Prepared

Wednesday, March 24, 2021

Any noncompliant QC parameters or other notes impacting data interpretation are flagged or documented on the final report or are noted below.

Certifies that this report has been approved by the Technical Director or Designee

179 Lake Avenue • Rochester, NY 14608 • (585) 647-2530 • Fax (585) 647-3311 • ELAP ID# 10958



Client: Inventum Engineering, P.C.

Project Reference: Riverview

Sample Identifier: SD-SPN-03172021

Lab Sample ID: 211053-01

Date Sampled: 3/17/2021

Matrix: Sludge

Date Received: 3/18/2021

Ammonia-N

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Ammonia	230	mg/Kg		3/23/2021
Method Reference(s):		SM 4500 NH3 BH		
Subcontractor ELAP ID:		11148		

Mercury

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Mercury	0.603	mg/Kg		3/22/2021 11:43
Method Reference(s):		EPA 7471B		
Preparation Date:		3/19/2021		
Data File:		Hg210322A		

Percent Solids

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Percent Solids	3.80	%		3/19/2021
Method Reference(s):		Par%M		
<i>ELAP does not offer this test for approval as part of their laboratory certification program.</i>				

Total Cyanide

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Cyanide, Total	461	mg/Kg	M	3/23/2021
Method Reference(s):		EPA 9014		
		EPA 9010C		
Preparation Date:		3/23/2021		



Client: Inventum Engineering, P.C.

Project Reference: Riverview

Sample Identifier: SD-SPS-03172021

Lab Sample ID: 211053-02

Date Sampled: 3/17/2021

Matrix: Sludge

Date Received: 3/18/2021

Ammonia-N

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Ammonia	78	mg/Kg		3/23/2021
Method Reference(s):		SM 4500 NH3 BH		
Subcontractor ELAP ID:		11148		

Mercury

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Mercury	0.555	mg/Kg		3/22/2021 11:45
Method Reference(s):		EPA 7471B		
Preparation Date:		3/19/2021		
Data File:		Hg210322A		

Percent Solids

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Percent Solids	26.2	%		3/19/2021
Method Reference(s):		Par%M		
<i>ELAP does not offer this test for approval as part of their laboratory certification program.</i>				

Total Cyanide

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Cyanide, Total	22.7	mg/Kg		3/23/2021
Method Reference(s):		EPA 9014		
		EPA 9010C		
Preparation Date:		3/23/2021		



Method Blank Report

Client: Inventum Engineering, P.C.
Project Reference: Riverview
Lab Project ID: 211053
Matrix: Sludge

Mercury

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Mercury	<0.00707	mg/Kg		3/22/2021 11:21

Method Reference(s): EPA 7471B
Preparation Date: 3/19/2021
Data File: Hg210322A
QC Batch ID: QC210319HgSoil
QC Number: Blk 1



QC Report for Laboratory Control Sample and Control Sample Duplicate

Client: Inventum Engineering, P.C.
Project Reference: Riverview
Lab Project ID: 211053
Matrix: Sludge

Mercury

<u>Analyte</u>	<u>LCS Added</u>	<u>LCSD Added</u>	<u>Spike Units</u>	<u>LCS Result</u>	<u>LCSD Result</u>	<u>LCS % Recovery</u>	<u>LCSD % Recovery</u>	<u>% Rec Limits</u>	<u>LCS Outliers</u>	<u>LCSD Outliers</u>	<u>Relative % Difference</u>	<u>RPD Limit</u>	<u>RPD Outliers</u>	<u>Date Analyzed</u>
Mercury	0.0750	0.0679	mg/Kg	0.0746	0.0667	99.4	98.3	80 - 120			1.16	20		3/22/2021

Method Reference(s): EPA 7471B
Preparation Date: 3/19/2021
Data File: Hg210322A
QC Number: 1
QC Batch ID: QC210319HgSoil

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.



Method Blank Report

Client: Inventum Engineering, P.C.
Project Reference: Riverview
Lab Project ID: 211053
SDG #: 1053-01
Matrix: Sludge

Total Cyanide

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Cyanide, Total	<0.485	mg/Kg		3/23/2021

Method Reference(s): EPA 9014
 EPA 9010C
Preparation Date: 3/23/2021
QC Batch ID: QC210323stcn
QC Number: Blk 1



QC Report for Laboratory Control Sample

Client: Inventum Engineering, P.C.
Project Reference: Riverview
Lab Project ID: 211053
SDG #: 1053-01
Matrix: Sludge

Total Cyanide

<u>Analyte</u>	<u>Spike Added</u>	<u>Spike Units</u>	<u>LCS Result</u>	<u>LCS % Recovery</u>	<u>% Rec Limits</u>	<u>LCS Outliers</u>	<u>Date Analyzed</u>
Cyanide, Total	4.72	mg/Kg	4.59	97.3	85 - 115		3/23/2021
Method Reference(s):	EPA 9014 EPA 9010C						
Preparation Date:	3/23/2021						
QC Number:	1						
QC Batch ID:	QC210323stcn						

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.



QC Report for Sample Spike and Sample Duplicate

Client: Inventum Engineering, P.C.
Project Reference: Riverview

SDG #: 1053-01
Lab Project ID: 211053

Lab Sample ID: 211053-01
Sample Identifier: SD-SPN-03172021
Matrix: Sludge

Date Sampled: 3/17/2021
Date Received: 3/18/2021

Total Cyanide

<u>Analyte</u>	<u>Sample Results</u>	<u>Result Units</u>	<u>Spike Added</u>	<u>Spike Result</u>	<u>Spike % Recovery</u>	<u>% Rec Limits</u>	<u>Spike Outliers</u>	<u>Duplicate Result</u>	<u>Relative % Difference</u>	<u>RPD Limit</u>	<u>RPD Outliers</u>	<u>Date Analyzed</u>
Cyanide, Total	461	mg/Kg	120	550	74.7	80 - 120	*	415	10.4	20		3/23/2021

Method Reference(s): EPA 9014
EPA 9010C
Preparation Date: 3/23/2021
QC Batch ID: QC210323stcn

NC = Not Calculable. Applicable to RPD if sample or duplicate result is non-detect or estimated (see primary report for data flags). Applicable to MS if sample is greater or equal to ten times the spike added.

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.



Analytical Report Appendix

The reported results relate only to the samples as they have been received by the laboratory.

Each page of this document is part of a multipage report. This document may not be reproduced except in its entirety, without the prior consent of Paradigm Environmental Services, Inc.

All soil/sludge samples have been reported on a dry weight basis, unless qualified "reported as received". Other solids are reported as received.

Low level Volatiles blank reports for soil/solid matrix are based on a nominal 5 gram weight. Sample results and reporting limits are based on actual weight, which may be more or less than 5 grams.

The Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt. Sample condition requirements are defined under the 2003 NELAC Standard, sections 5.5.8.3.1 and 5.5.8.3.2.

NYSDOH ELAP does not certify for all parameters. Paradigm Environmental Services or the indicated subcontracted laboratory does hold certification for all analytes where certification is offered by ELAP unless otherwise specified. Aliquots separated for certain tests, such as TCLP, are indicated on the Chain of Custody and final reports with an "A" suffix.

Data qualifiers are used, when necessary, to provide additional information about the data. This information may be communicated as a flag or as text at the bottom of the report. Please refer to the following list of analyte-specific, frequently used data flags and their meaning:

"<" = Analyzed for but not detected at or above the quantitation limit.

"E" = Result has been estimated, calibration limit exceeded.

"Z" = See case narrative.

"D" = Sample, Laboratory Control Sample, or Matrix Spike Duplicate results above Relative Percent Difference limit.

"M" = Matrix spike recoveries outside QC limits. Matrix bias indicated.

"B" = Method blank contained trace levels of analyte. Refer to included method blank report.

"J" = Result estimated between the quantitation limit and half the quantitation limit.

"L" = Laboratory Control Sample recovery outside accepted QC limits.

"P" = Concentration differs by more than 40% between the primary and secondary analytical columns.

"NC" = Not calculable. Applicable to RPD if sample or duplicate result is non-detect or estimated (see primary report for data flags). Applicable to MS if sample is greater or equal to ten times the spike added. Applicable to sample surrogates or MS if sample dilution is 10x or higher.

"" = Indicates any recoveries outside associated acceptance windows. Surrogate outliers in samples are presumed matrix effects. LCS demonstrates method compliance unless otherwise noted.*

"(1)" = Indicates data from primary column used for QC calculation.

"A" = denotes a parameter for which ELAP does not offer approval as part of their laboratory certification program.

"F" = denotes a parameter for which Paradigm does not carry certification, the results for which should therefore only be used where ELAP certification is not required, such as personal exposure assessment.

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GENERAL TERMS AND CONDITIONS

LABORATORY SERVICES

These Terms and Conditions embody the whole agreement of the parties in the absence of a signed and executed contract between the Laboratory (LAB) and Client. They shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties. The LAB specifically rejects all additional, inconsistent, or conflicting terms, whether printed or otherwise set forth in any purchase order or other communication from the Client to the LAB. The invalidity or unenforceability in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder of the Terms and Conditions. No waiver by LAB of any provision, term, or condition hereof or of any breach by or obligation of the Client hereunder shall constitute a waiver of such provision, term, or condition on any other occasion or a waiver of any other breach by or obligation of the Client. This agreement shall be administered and interpreted under the laws of the state which services are procured.

Warranty.

Recognizing that the nature of many samples is unknown and that some may contain potentially hazardous components, LAB warrants only that it will perform testing services, obtain findings, and prepare reports in accordance with generally accepted analytical laboratory principles and practices at the time of performance of services. LAB makes no other warranty, express or implied.

Scope and Compensation.

LAB agrees to perform the services described in the chain of custody to which these terms and conditions are attached. Unless the parties agree in writing to the contrary, the duties of LAB shall not be construed to exceed the services specifically described. LAB will use LAB default method for all tests unless specified otherwise on the Work Order.

Payment terms are net 30 days from the date of invoice. All overdue payments are subject to an interest charge of one and one-half percent (1-1/2%) per month or a portion thereof. Client shall also be responsible for costs of collection, including payment of reasonable attorney fees if such expense is incurred. The prices, unless stated, do not include any sale, use or other taxes. Such taxes will be added to invoice prices when required.

Prices.

Compensation for services performed will be based on the current Lab Analytical Fee Schedule or on quotations agreed to in writing by the parties. Turnaround time based charges are determined from the time of resolution of all work order questions. Testimony, court appearances or data compilation for legal action will be charged separately. Evaluation and reporting of initial screening runs may incur additional fees.

Limitations of Liability.

In the event of any error, omission, or other professional negligence, the sole and exclusive responsibility of LAB shall be to re-perform the deficient work at its own expense and LAB shall have no other liability whatsoever. All claims shall be deemed waived unless made in writing and received by LAB within ninety (90) days following completion of services.

LAB shall have no liability, obligation, or responsibility of any kind for losses, costs, expenses, or other damages (including but not limited to any special, direct, incidental or consequential damages) with respect to LAB's services or results.

All results provided by LAB are strictly for the use of its clients and LAB is in no way responsible for the use of such results by clients or third parties. All reports should be considered in their entirety, and LAB is not responsible for the separation, detachment, or other use of any portion of these reports. Client may not assign the lab report without the written consent of the LAB.

Client covenants and agrees, at its/his/her sole expense, to indemnify, protect, defend, and save harmless the LAB from and against any and all damages, losses, liabilities, obligations, penalties, claims, litigation, demands, defenses, judgments, suits, actions, proceedings, costs, disbursements and/or expenses (including, without limitation attorneys' and experts' fees and disbursements) of any kind whatsoever which may at any time be imposed upon, incurred by or asserted or awarded against client relating to, resulting from or arising out of (a) the breach of this agreement by this client, (b) the negligence of the client in handling, delivering or disclosing any hazardous substance, (c) the violation of the Client of any applicable law, (d) non-compliance by the Client with any environmental permit or (e) a material misrepresentation in disclosing the materials to be tested.

Hazard Disclosure.

Client represents and warrants that any sample delivered to LAB will be preceded or accompanied by complete written disclosure of the presence of any hazardous substances known or suspected by Client. Client further warrants that any sample containing any hazardous substance that is to be delivered to LAB will be packaged, labeled, transported, and delivered properly and in accordance with applicable laws.

Sample Handling.

Prior to LAB's acceptance of any sample (or after any revocation of acceptance), the entire risk of loss or of damage to such sample remains with Client. Samples are accepted when receipt is acknowledged on chain of custody documentation. In no event will LAB have any responsibility for the action or inaction of any carrier shipping or delivering any sample to or from LAB premises.

Client authorizes LAB to proceed with the analysis of samples as received by the laboratory, recognizing that any samples not in compliance with all current DOH-ELAP-NELAP requirements for containers, preservation or holding time will be noted as such on the final report.

Disposal of hazardous waste samples is the responsibility of the Client. If the Client does not wish such samples returned, LAB may add storage and disposal fees to the final invoice. Maximum storage time for samples is 30 days after completion of analysis unless modified by applicable state or federal laws. Client will be required to give the LAB written instructions concerning disposal of these samples.

LAB reserves the absolute right, exercisable at any time, to refuse to receive delivery of, refuse to accept, or revoke acceptance of any sample, which, in the sole judgment of LAB (a) is of unsuitable volume, (b) may be or become unsuitable for or may pose a risk in handling, transport, or processing for any health, safety, environmental or other reason whether or not due to the presence in the sample of any hazardous substance, and whether or not such presence has been disclosed to LAB by Client or (c) if the condition or sample date make the sample unsuitable for analysis.

Legal Responsibility.

LAB is solely responsible for performance of this contract, and no affiliated company, director, officer, employee, or agent shall have any legal responsibility hereunder, whether in contract or tort including negligence.

Assignment.

LAB may assign its performance obligations under this contract to other parties, as it deems necessary. LAB shall disclose to Client any assignee (subcontractor) by ELAP ID # on the submitted final report.

Force Majeure.

LAB shall have no responsibility or liability to the Client for any failure or delay in performance by LAB, which results in whole or in part from any cause or circumstance beyond the reasonable control of LAB. Such causes and circumstances shall include, but not limited to, acts of God, acts or orders of any government authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, difficulties or delays in transportation, mail or delivery services, inability to obtain sufficient services or supplies from LAB's usual suppliers, or any other cause beyond LAB's reasonable control.

Law.

This contract shall be continued under the laws of the State of New York without regard to its conflicts of laws provision.

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Report Prepared Wednesday, March 24, 2021

1062



Invention client **CHAIN OF CUSTODY**

REPORT TO: *mm 3/18/21* INVOICE TO:

CLIENT: <i>John Black</i>	CLIENT: <i>Same</i>	LAB PROJECT ID: <i>211053</i>
ADDRESS: <i>481 Carlisle Dr.</i>	ADDRESS:	Quotation #:
CITY: <i>Herndon</i> STATE: <i>VA</i> ZIP: <i>20170</i>	CITY: STATE: ZIP:	Email: john.black <i>john.black</i>
PHONE: <i>(571) 217-6761</i>	PHONE:	
ATTN: <i>John Black</i>	ATTN:	

PROJECT REFERENCE
River view

Matrix Codes:

AQ - Aqueous Liquid	WA - Water	DW - Drinking Water	SO - Soil	SD - Solid	WP - Wipe	OL - Oil
NQ - Non-Aqueous Liquid	WG - Groundwater	WW - Wastewater	SL - Sludge	PT - Paint	CK - Caulk	AR - Air

DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX	CONTAINER	REQUESTED ANALYSIS				REMARKS	PARADIGM LAB SAMPLE NUMBER
							Ammonia	Cyanide	Mercury	Percent Solids		
<i>3/17/21</i>	<i>11:00am</i>			<i>SD-SPN-03172021</i>	<i>sludge</i>	<i>1</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>Mercury is now method 245</i>	<i>01</i>
	<i>11:15am</i>			<i>SD-SPS-03172021</i>	<i>6</i>	<i>1</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>BZ 3/18</i>	<i>02</i>
					<i>per visual</i>						<i>BZ 3/18 1:47</i>	
					<i>in sludge</i>						<i>Mercury is now method 7478</i>	
											<i>7471B</i>	
											<i>BZ 3/18 2:11</i>	
											<i>sub sent directly to sub lab mm 3/18/21</i>	

Turnaround Time	Report Supplements	
Availability contingent upon lab approval; additional fees may apply.		
Standard 5 day <input checked="" type="checkbox"/>	None Required <input type="checkbox"/>	None Required <input type="checkbox"/>
10 day <input type="checkbox"/>	Batch QC <input checked="" type="checkbox"/>	Basic EDD <input type="checkbox"/>
Rush 3 day <input type="checkbox"/>	Category A <input type="checkbox"/>	NYSDEC EDD <input checked="" type="checkbox"/>
Rush 2 day <input type="checkbox"/>	Category B <input type="checkbox"/>	
Rush 1 day <input type="checkbox"/>		
Date Needed _____	Other <input type="checkbox"/>	Other EDD <input type="checkbox"/>
<small>please indicate date needed:</small>	<small>please indicate package needed:</small>	<small>please indicate EDD needed:</small>

Keith Addeley *3/17/21*
 Sampled By Date/Time
Keith Addeley *3/17/21*
 Relinquished By Date/Time
Brian Z... *3/17/21 4:00*
 Received By Date/Time
Molly Vail *3/18/21 1603*
 Received @ Lab By Date/Time
3°C rec'd 3/18/21 15:56

Total Cost:
 P.I.F.

2072



Chain of Custody Supplement

Client: Inventum Completed by: Molykai
 Lab Project ID: 211053 Date: 31/8/21

Sample Condition Requirements

Per NELAC/ELAP 210/241/242/243/244

Condition	NELAC compliance with the sample condition requirements upon receipt		
	Yes	No	N/A
Container Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments			
Transferred to method-compliant container	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Headspace (<1 mL)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments			
Preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments			
Chlorine Absent (<0.10 ppm per test strip)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments			
Holding Time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments			
Temperature	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> met
Comments	3°C		
Compliant Sample Quantity/Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	ammonia sent directly to sublab		



CHAIN OF CUSTODY

REPORT TO:		INVOICE TO:		ELAP ID#
CLIENT: Paradigm Environmental Services	CLIENT: Same	LAB PROJECT ID		L2113351
ADDRESS: 179 Lake Avenue		ADDRESS:		Quotation #:
CITY: Rochester STATE: NY ZIP: 14608	CITY: STATE: ZIP:	Email: please email reports to reporting@paradigmenv.com		
PHONE:	PHONE:	ATTN: Reporting		
ATTN: Accounts Payable		Matrix Codes:		
AQ - Aqueous Liquid	WA - Water	DW - Drinking Water	SO - Soil	SD - Solid
NQ - Non-Aqueous Liquid	WG - Groundwater	WW - Wastewater	SL - Sludge	PT - Paint
				WP - Wipe
				CK - Caulk
				OL - Oil
				AR - Air

PROJECT REFERENCE
Riverview

REQUESTED ANALYSIS									
DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX	CONTAINER OF	Ammonia	REMARKS	PARADIGM LAB SAMPLE NUMBER
3/17/21	11:00			SD-SPN-03172021	SO		X		
3/17/21	11:15			SD-SPS-03172021	SO		X		

Turnaround Time	Report Supplements	
Availability contingent upon lab approval; additional fees may apply.		
Standard 5 day <input checked="" type="checkbox"/>	None Required <input type="checkbox"/>	None Required <input type="checkbox"/>
10 day <input type="checkbox"/>	Batch QC <input checked="" type="checkbox"/>	Basic EDD <input type="checkbox"/>
Rush 3 day <input type="checkbox"/>	Category A <input type="checkbox"/>	NYSDEC EDD <input checked="" type="checkbox"/>
Rush 2 day <input type="checkbox"/>	Category B <input type="checkbox"/>	
Rush 1 day <input type="checkbox"/>		
Other <input type="checkbox"/>	Other <input type="checkbox"/>	Other EDD <input type="checkbox"/>
please indicate date needed:	please indicate package needed:	please indicate EDD needed:

Client

Sampled By	Date/Time	Total Cost:
<i>Brian Z...</i>	3/17/21 16:00	<input style="width: 80%; height: 30px;" type="text"/>
Relinquished By	Date/Time	
<i>Willy...</i>	3/17/21 1600	
Received By	Date/Time	P.I.F.
<i>Willy...</i>	3/17/21 1600	<input style="width: 80%; height: 30px;" type="text"/>
Received @ Lab By	Date/Time	
<i>[Signature]</i>	3/18/21 0125	

By signing this form, client agrees to Paradigm Terms and Conditions (reverse).



Client: Inventum Engineering, P.C.

Project Reference: Riverview

Sample Identifier: SD-NSP-04142021-14.5

Lab Sample ID: 211570-01

Date Sampled: 4/14/2021

Matrix: Sludge

Date Received: 4/16/2021

Corrosivity as pH

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Corrosivity (as pH)	12.39 @ 22.1 C	S.U.		4/19/2021 16:30
Method Reference(s):	EPA 9045D			

Ignitability

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Ignitability	No Burn	mm / sec		4/21/2021
Method Reference(s):	EPA 1030			

Mercury

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Mercury	0.407	mg/Kg		4/21/2021 09:33
Method Reference(s):	EPA 7471B			
Preparation Date:	4/20/2021			
Data File:	Hg210421C			

TAL Metals (ICP)

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Aluminum	15000	mg/Kg		4/20/2021 15:42
Antimony	< 6.64	mg/Kg		4/20/2021 15:42
Arsenic	13.2	mg/Kg		4/20/2021 15:42
Barium	160	mg/Kg		4/20/2021 15:42
Beryllium	0.741	mg/Kg		4/20/2021 15:42
Cadmium	1.81	mg/Kg		4/20/2021 15:42
Calcium	240000	mg/Kg		4/21/2021 14:48
Chromium	39.6	mg/Kg		4/20/2021 15:42
Cobalt	9.26	mg/Kg		4/20/2021 15:42
Copper	77.3	mg/Kg		4/20/2021 15:42
Iron	30500	mg/Kg		4/20/2021 15:42
Lead	38.7	mg/Kg		4/20/2021 15:42

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Client: Inventum Engineering, P.C.

Project Reference: Riverview

Sample Identifier: SD-NSP-04142021-14.5

Lab Sample ID: 211570-01

Date Sampled: 4/14/2021

Matrix: Sludge

Date Received: 4/16/2021

Magnesium	5150	mg/Kg	4/20/2021 15:42
Manganese	444	mg/Kg	4/20/2021 15:42
Nickel	33.6	mg/Kg	4/20/2021 15:42
Potassium	4280	mg/Kg	4/20/2021 15:42
Selenium	5.02	mg/Kg	4/20/2021 15:42
Silver	< 1.11	mg/Kg	4/20/2021 15:42
Sodium	972	mg/Kg	4/20/2021 15:42
Thallium	< 2.77	mg/Kg	4/20/2021 15:42
Vanadium	32.1	mg/Kg	4/20/2021 15:42
Zinc	211	mg/Kg	4/20/2021 15:42

Method Reference(s): EPA 6010C
EPA 3050B
Preparation Date: 4/19/2021
Data File: 210420C

Paint Filter Test

Analyte	Result	Units	Qualifier	Date Analyzed
Paint Filter Test	Pass	N/A		4/22/2021

Method Reference(s): EPA 9095B

PCBs

Analyte	Result	Units	Qualifier	Date Analyzed
PCB-1016	< 0.350	mg/Kg		4/19/2021 17:54
PCB-1221	< 0.350	mg/Kg		4/19/2021 17:54
PCB-1232	< 0.350	mg/Kg		4/19/2021 17:54
PCB-1242	< 0.350	mg/Kg		4/19/2021 17:54
PCB-1248	< 0.350	mg/Kg		4/19/2021 17:54
PCB-1254	< 0.350	mg/Kg		4/19/2021 17:54
PCB-1260	< 0.350	mg/Kg		4/19/2021 17:54
PCB-1262	< 0.350	mg/Kg		4/19/2021 17:54
PCB-1268	< 0.350	mg/Kg		4/19/2021 17:54



Client: Inventum Engineering, P.C.

Project Reference: Riverview

Sample Identifier: SD-NSP-04142021-14.5

Lab Sample ID: 211570-01

Date Sampled: 4/14/2021

Matrix: Sludge

Date Received: 4/16/2021

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Limits</u>	<u>Outliers</u>	<u>Date Analyzed</u>
Tetrachloro-m-xylene	42.7	16.4 - 99.1		4/19/2021 17:54

Method Reference(s): EPA 8082A

EPA 3546

Preparation Date: 4/19/2021

Reactive Cyanide

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Reactivity, Cyanide	<10	mg/Kg		4/21/2021

Method Reference(s): EPA 7.3.3.2

Subcontractor ELAP ID: 11148

ELAP does not offer this test for approval as part of their laboratory certification program.

Reactive Sulfide

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Reactivity, Sulfide	<10	mg/Kg		4/21/2021

Method Reference(s): EPA 7.3.4.2

Subcontractor ELAP ID: 11148

ELAP does not offer this test for approval as part of their laboratory certification program.

Semi-Volatile Organics (Acid/Base Neutrals)

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
1,1-Biphenyl	< 618	ug/Kg		4/20/2021 05:28
1,2,4,5-Tetrachlorobenzene	< 618	ug/Kg		4/20/2021 05:28
1,2,4-Trichlorobenzene	< 618	ug/Kg		4/20/2021 05:28
1,2-Dichlorobenzene	< 618	ug/Kg		4/20/2021 05:28
1,3-Dichlorobenzene	< 618	ug/Kg		4/20/2021 05:28
1,4-Dichlorobenzene	< 618	ug/Kg		4/20/2021 05:28
2,2-Oxybis (1-chloropropane)	< 618	ug/Kg		4/20/2021 05:28
2,3,4,6-Tetrachlorophenol	< 618	ug/Kg		4/20/2021 05:28
2,4,5-Trichlorophenol	< 618	ug/Kg		4/20/2021 05:28
2,4,6-Trichlorophenol	< 618	ug/Kg		4/20/2021 05:28
2,4-Dichlorophenol	< 618	ug/Kg		4/20/2021 05:28



Lab Project ID: 211570

Client: Inventum Engineering, P.C.

Project Reference: Riverview

Sample Identifier: SD-NSP-04142021-14.5

Lab Sample ID: 211570-01

Date Sampled: 4/14/2021

Matrix: Sludge

Date Received: 4/16/2021

2,4-Dimethylphenol	< 618	ug/Kg	4/20/2021 05:28
2,4-Dinitrophenol	< 2470	ug/Kg	4/20/2021 05:28
2,4-Dinitrotoluene	< 618	ug/Kg	4/20/2021 05:28
2,6-Dinitrotoluene	< 618	ug/Kg	4/20/2021 05:28
2-Chloronaphthalene	< 618	ug/Kg	4/20/2021 05:28
2-Chlorophenol	< 618	ug/Kg	4/20/2021 05:28
2-Methylnapthalene	2150	ug/Kg	4/20/2021 05:28
2-Methylphenol	< 618	ug/Kg	4/20/2021 05:28
2-Nitroaniline	< 618	ug/Kg	4/20/2021 05:28
2-Nitrophenol	< 618	ug/Kg	4/20/2021 05:28
3&4-Methylphenol	< 618	ug/Kg	4/20/2021 05:28
3,3'-Dichlorobenzidine	< 618	ug/Kg	4/20/2021 05:28
3-Nitroaniline	< 618	ug/Kg	4/20/2021 05:28
4,6-Dinitro-2-methylphenol	< 827	ug/Kg	4/20/2021 05:28
4-Bromophenyl phenyl ether	< 618	ug/Kg	4/20/2021 05:28
4-Chloro-3-methylphenol	< 618	ug/Kg	4/20/2021 05:28
4-Chloroaniline	< 618	ug/Kg	4/20/2021 05:28
4-Chlorophenyl phenyl ether	< 618	ug/Kg	4/20/2021 05:28
4-Nitroaniline	< 618	ug/Kg	4/20/2021 05:28
4-Nitrophenol	< 618	ug/Kg	4/20/2021 05:28
Acenaphthene	< 618	ug/Kg	4/20/2021 05:28
Acenaphthylene	956	ug/Kg	4/20/2021 05:28
Acetophenone	< 618	ug/Kg	4/20/2021 05:28
Anthracene	2170	ug/Kg	4/20/2021 05:28
Atrazine	< 618	ug/Kg	4/20/2021 05:28
Benzaldehyde	< 618	ug/Kg	4/20/2021 05:28
Benzo (a) anthracene	4290	ug/Kg	4/20/2021 05:28
Benzo (a) pyrene	3530	ug/Kg	4/20/2021 05:28
Benzo (b) fluoranthene	4240	ug/Kg	4/20/2021 05:28
Benzo (g,h,i) perylene	2500	ug/Kg	4/20/2021 05:28

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Lab Project ID: 211570

Client: Inventum Engineering, P.C.

Project Reference: Riverview

Sample Identifier: SD-NSP-04142021-14.5

Lab Sample ID: 211570-01

Date Sampled: 4/14/2021

Matrix: Sludge

Date Received: 4/16/2021

Benzo (k) fluoranthene	2830	ug/Kg	4/20/2021 05:28
Bis (2-chloroethoxy) methane	< 618	ug/Kg	4/20/2021 05:28
Bis (2-chloroethyl) ether	< 618	ug/Kg	4/20/2021 05:28
Bis (2-ethylhexyl) phthalate	< 618	ug/Kg	4/20/2021 05:28
Butylbenzylphthalate	< 618	ug/Kg	4/20/2021 05:28
Caprolactam	< 618	ug/Kg	4/20/2021 05:28
Carbazole	938	ug/Kg	4/20/2021 05:28
Chrysene	5140	ug/Kg	4/20/2021 05:28
Dibenz (a,h) anthracene	721	ug/Kg	4/20/2021 05:28
Dibenzofuran	1500	ug/Kg	4/20/2021 05:28
Diethyl phthalate	< 618	ug/Kg	4/20/2021 05:28
Dimethyl phthalate	< 618	ug/Kg	4/20/2021 05:28
Di-n-butyl phthalate	< 618	ug/Kg	4/20/2021 05:28
Di-n-octylphthalate	< 618	ug/Kg	4/20/2021 05:28
Fluoranthene	7840	ug/Kg	4/20/2021 05:28
Fluorene	1650	ug/Kg	4/20/2021 05:28
Hexachlorobenzene	< 618	ug/Kg	4/20/2021 05:28
Hexachlorobutadiene	< 618	ug/Kg	4/20/2021 05:28
Hexachlorocyclopentadiene	< 2470	ug/Kg	4/20/2021 05:28
Hexachloroethane	< 618	ug/Kg	4/20/2021 05:28
Indeno (1,2,3-cd) pyrene	2280	ug/Kg	4/20/2021 05:28
Isophorone	< 618	ug/Kg	4/20/2021 05:28
Naphthalene	11100	ug/Kg	4/20/2021 05:28
Nitrobenzene	< 618	ug/Kg	4/20/2021 05:28
N-Nitroso-di-n-propylamine	< 618	ug/Kg	4/20/2021 05:28
N-Nitrosodiphenylamine	< 618	ug/Kg	4/20/2021 05:28
Pentachlorophenol	< 1240	ug/Kg	4/20/2021 05:28
Phenanthrene	6880	ug/Kg	4/20/2021 05:28
Phenol	< 618	ug/Kg	4/20/2021 05:28
Pyrene	5800	ug/Kg	4/20/2021 05:28

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.



Lab Project ID: 211570

Client: Inventum Engineering, P.C.

Project Reference: Riverview

Sample Identifier: SD-NSP-04142021-14.5

Lab Sample ID: 211570-01

Date Sampled: 4/14/2021

Matrix: Sludge

Date Received: 4/16/2021

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
2,4,6-Tribromophenol	7.40	34.6 - 87.3	*	4/20/2021 05:28
2-Fluorobiphenyl	43.4	34.6 - 83.9		4/20/2021 05:28
2-Fluorophenol	2.59	38.2 - 79	*	4/20/2021 05:28
Nitrobenzene-d5	5.08	32.4 - 76	*	4/20/2021 05:28
Phenol-d5	19.1	37 - 75.5	*	4/20/2021 05:28
Terphenyl-d14	45.7	38.2 - 88.8		4/20/2021 05:28

Method Reference(s): EPA 8270D
 EPA 3546
 Preparation Date: 4/19/2021
 Data File: B53516.D

Volatile Organics

Analyte	Result	Units	Qualifier	Date Analyzed
1,1,1-Trichloroethane	< 10.7	ug/Kg		4/20/2021 16:28
1,1,2,2-Tetrachloroethane	< 10.7	ug/Kg		4/20/2021 16:28
1,1,2-Trichloroethane	< 10.7	ug/Kg		4/20/2021 16:28
1,1-Dichloroethane	< 10.7	ug/Kg		4/20/2021 16:28
1,1-Dichloroethene	< 10.7	ug/Kg		4/20/2021 16:28
1,2,3-Trichlorobenzene	< 26.6	ug/Kg		4/20/2021 16:28
1,2,4-Trichlorobenzene	< 26.6	ug/Kg		4/20/2021 16:28
1,2-Dibromo-3-Chloropropane	< 53.3	ug/Kg		4/20/2021 16:28
1,2-Dibromoethane	< 10.7	ug/Kg		4/20/2021 16:28
1,2-Dichlorobenzene	< 10.7	ug/Kg		4/20/2021 16:28
1,2-Dichloroethane	< 10.7	ug/Kg		4/20/2021 16:28
1,2-Dichloropropane	< 10.7	ug/Kg		4/20/2021 16:28
1,3-Dichlorobenzene	< 10.7	ug/Kg		4/20/2021 16:28
1,4-Dichlorobenzene	< 10.7	ug/Kg		4/20/2021 16:28
1,4-Dioxane	< 53.3	ug/Kg		4/20/2021 16:28
2-Butanone	< 53.3	ug/Kg		4/20/2021 16:28
2-Hexanone	< 26.6	ug/Kg		4/20/2021 16:28
4-Methyl-2-pentanone	< 26.6	ug/Kg		4/20/2021 16:28

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Lab Project ID: 211570

Client: Inventum Engineering, P.C.

Project Reference: Riverview

Sample Identifier: SD-NSP-04142021-14.5

Lab Sample ID: 211570-01

Date Sampled: 4/14/2021

Matrix: Sludge

Date Received: 4/16/2021

Acetone	124	ug/Kg	4/20/2021 16:28
Benzene	< 10.7	ug/Kg	4/20/2021 16:28
Bromochloromethane	< 26.6	ug/Kg	4/20/2021 16:28
Bromodichloromethane	< 10.7	ug/Kg	4/20/2021 16:28
Bromoform	< 26.6	ug/Kg	4/20/2021 16:28
Bromomethane	< 10.7	ug/Kg	4/20/2021 16:28
Carbon disulfide	54.0	ug/Kg	4/20/2021 16:28
Carbon Tetrachloride	< 10.7	ug/Kg	4/20/2021 16:28
Chlorobenzene	< 10.7	ug/Kg	4/20/2021 16:28
Chloroethane	< 10.7	ug/Kg	4/20/2021 16:28
Chloroform	< 10.7	ug/Kg	4/20/2021 16:28
Chloromethane	< 10.7	ug/Kg	4/20/2021 16:28
cis-1,2-Dichloroethene	< 10.7	ug/Kg	4/20/2021 16:28
cis-1,3-Dichloropropene	< 10.7	ug/Kg	4/20/2021 16:28
Cyclohexane	< 53.3	ug/Kg	4/20/2021 16:28
Dibromochloromethane	< 10.7	ug/Kg	4/20/2021 16:28
Dichlorodifluoromethane	< 10.7	ug/Kg	4/20/2021 16:28
Ethylbenzene	< 10.7	ug/Kg	4/20/2021 16:28
Freon 113	< 10.7	ug/Kg	4/20/2021 16:28
Isopropylbenzene	< 10.7	ug/Kg	4/20/2021 16:28
m,p-Xylene	< 10.7	ug/Kg	4/20/2021 16:28
Methyl acetate	< 10.7	ug/Kg	4/20/2021 16:28
Methyl tert-butyl Ether	< 10.7	ug/Kg	4/20/2021 16:28
Methylcyclohexane	< 10.7	ug/Kg	4/20/2021 16:28
Methylene chloride	< 26.6	ug/Kg	4/20/2021 16:28
o-Xylene	< 10.7	ug/Kg	4/20/2021 16:28
Styrene	< 26.6	ug/Kg	4/20/2021 16:28
Tetrachloroethene	< 10.7	ug/Kg	4/20/2021 16:28
Toluene	< 10.7	ug/Kg	4/20/2021 16:28
trans-1,2-Dichloroethene	< 10.7	ug/Kg	4/20/2021 16:28

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Client: Inventum Engineering, P.C.

Project Reference: Riverview

Sample Identifier: SD-NSP-04142021-14.5

Lab Sample ID: 211570-01

Date Sampled: 4/14/2021

Matrix: Sludge

Date Received: 4/16/2021

trans-1,3-Dichloropropene	< 10.7	ug/Kg	4/20/2021	16:28
Trichloroethene	< 10.7	ug/Kg	4/20/2021	16:28
Trichlorofluoromethane	< 10.7	ug/Kg	4/20/2021	16:28
Vinyl chloride	< 10.7	ug/Kg	4/20/2021	16:28

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Limits</u>	<u>Outliers</u>	<u>Date Analyzed</u>
1,2-Dichloroethane-d4	100	52.5 - 151		4/20/2021 16:28
4-Bromofluorobenzene	84.3	37.7 - 146		4/20/2021 16:28
Pentafluorobenzene	103	92.1 - 115		4/20/2021 16:28
Toluene-D8	96.3	74 - 120		4/20/2021 16:28

Method Reference(s): EPA 8260C
EPA 5035A - L
Data File: z00950.D

This sample was not collected following SW846 5035A specifications. Accordingly, any Volatiles soil results that are less than 200 ug/Kg, including Non Detects, may be biased low, per ELAP method 5035 guidance document from 11/15/2012.

Total Cyanide

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Cyanide, Total	14.5	mg/Kg	M	4/22/2021

Method Reference(s): EPA 9014
EPA 9010C
Preparation Date: 4/21/2021



Client: Inventum Engineering, P.C.

Project Reference: Riverview

Sample Identifier: SD-NSP-04142021-14.5

Lab Sample ID: 211570-01A

Date Sampled: 4/14/2021

Matrix: TCLP Extract

Date Received: 4/16/2021

TCLP Semi-Volatile Organics

Analyte	Result	Units	Regulatory Limit	Qualifier	Date Analyzed
1,4-Dichlorobenzene	< 50.0	ug/L	7500		4/20/2021 16:07
2,4,5-Trichlorophenol	< 50.0	ug/L	400000		4/20/2021 16:07
2,4,6-Trichlorophenol	< 50.0	ug/L	2000		4/20/2021 16:07
2,4-Dinitrotoluene	< 50.0	ug/L	130		4/20/2021 16:07
Cresols (as m,p,o-Cresol)	< 100	ug/L	200000		4/20/2021 16:07
Hexachlorobenzene	< 50.0	ug/L	130		4/20/2021 16:07
Hexachlorobutadiene	< 50.0	ug/L	500		4/20/2021 16:07
Hexachloroethane	< 50.0	ug/L	3000		4/20/2021 16:07
Nitrobenzene	< 50.0	ug/L	2000		4/20/2021 16:07
Pentachlorophenol	< 100	ug/L	100000		4/20/2021 16:07
Pyridine	< 50.0	ug/L	5000		4/20/2021 16:07

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
2,4,6-Tribromophenol	91.2	56.5 - 119		4/20/2021 16:07
2-Fluorobiphenyl	74.9	38.9 - 93.8		4/20/2021 16:07
2-Fluorophenol	72.5	13.2 - 103		4/20/2021 16:07
Nitrobenzene-d5	83.8	43.1 - 104		4/20/2021 16:07
Phenol-d5	68.2	10 - 102		4/20/2021 16:07
Terphenyl-d14	95.9	51.8 - 109		4/20/2021 16:07

Method Reference(s): EPA 8270D
EPA 1311 / 3510C
Preparation Date: 4/19/2021
Data File: B53537.D

TCLP Herbicides

Analyte	Result	Units	Regulatory Limit	Qualifier	Date Analyzed
2,4,5-TP (Silvex)	<0.005	mg/L	1		4/26/2021
2,4-D	<0.025	mg/L	10		4/26/2021



Client: Inventum Engineering, P.C.

Project Reference: Riverview

Sample Identifier: SD-NSP-04142021-14.5

Lab Sample ID: 211570-01A

Date Sampled: 4/14/2021

Matrix: TCLP Extract

Date Received: 4/16/2021

Method Reference(s): EPA 8151A

EPA 1311

Subcontractor ELAP ID: 11148

TCLP Mercury

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Regulatory Limit</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Mercury	< 0.00200	mg/L	0.2		4/20/2021 09:42

Method Reference(s): EPA 7470A

EPA 1311

Preparation Date: 4/20/2021

Data File: Hg210420C

TCLP Pesticides

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Regulatory Limit</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Chlordane	< 2.00	ug/L	30		4/20/2021 16:22
Endrin	< 1.00	ug/L	20		4/20/2021 16:22
gamma-BHC (Lindane)	< 1.00	ug/L	400		4/20/2021 16:22
Heptachlor	< 1.00	ug/L	8		4/20/2021 16:22
Heptachlor Epoxide	< 1.00	ug/L	8		4/20/2021 16:22
Methoxychlor	< 1.00	ug/L	10000		4/20/2021 16:22
Toxaphene	< 20.0	ug/L	500		4/20/2021 16:22

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Limits</u>	<u>Outliers</u>	<u>Date Analyzed</u>
Decachlorobiphenyl (1)	96.3	10 - 185		4/20/2021 16:22
Tetrachloro-m-xylene (1)	83.5	20.4 - 124		4/20/2021 16:22

Method Reference(s): EPA 8081B

EPA 1311 / 3510C

Preparation Date: 4/20/2021

TCLP RCRA Metals (ICP)

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Regulatory Limit</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
Arsenic	< 0.500	mg/L	5		4/19/2021 17:20
Barium	< 0.500	mg/L	100		4/19/2021 17:20
Cadmium	< 0.0250	mg/L	1		4/19/2021 17:20



Lab Project ID: 211570

Client: Inventum Engineering, P.C.

Project Reference: Riverview

Sample Identifier: SD-NSP-04142021-14.5

Lab Sample ID: 211570-01A

Date Sampled: 4/14/2021

Matrix: TCLP Extract

Date Received: 4/16/2021

Chromium	< 0.500	mg/L	5	4/19/2021 17:20
Lead	< 0.500	mg/L	5	4/19/2021 17:20
Selenium	< 0.200	mg/L	1	4/19/2021 17:20
Silver	< 0.500	mg/L	5	4/19/2021 17:20

Method Reference(s): EPA 6010C
EPA 1311 / 3005A
Preparation Date: 4/19/2021
Data File: 210419C

TCLP Volatile Organics

Analyte	Result	Units	Regulatory Limit	Qualifier	Date Analyzed
1,1-Dichloroethene	< 20.0	ug/L	700		4/21/2021 14:15
1,2-Dichloroethane	< 20.0	ug/L	500		4/21/2021 14:15
2-Butanone	< 100	ug/L	200000		4/21/2021 14:15
Benzene	< 20.0	ug/L	500		4/21/2021 14:15
Carbon Tetrachloride	< 20.0	ug/L	500		4/21/2021 14:15
Chlorobenzene	< 20.0	ug/L	100000		4/21/2021 14:15
Chloroform	< 20.0	ug/L	6000		4/21/2021 14:15
Tetrachloroethene	< 20.0	ug/L	700		4/21/2021 14:15
Trichloroethene	< 20.0	ug/L	500		4/21/2021 14:15
Vinyl chloride	< 20.0	ug/L	200		4/21/2021 14:15

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
1,2-Dichloroethane-d4	96.4	64 - 142		4/21/2021 14:15
4-Bromofluorobenzene	89.6	37.2 - 146		4/21/2021 14:15
Pentafluorobenzene	99.7	91.4 - 114		4/21/2021 14:15
Toluene-D8	92.0	73.1 - 120		4/21/2021 14:15

Method Reference(s): EPA 8260C
EPA 1311 / 5030C
Data File: z00984.D

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QC Report for Matrix Spike and Matrix Spike Duplicate

Client: Inventum Engineering, P.C.

Lab Project ID: 211570

Project Reference: Riverview

Lab Sample ID: 211570-01
Sample Identifier: SD-NSP-04142021-14.5
Matrix: Sludge

Date Sampled: 4/14/2021
Date Received: 4/16/2021
Date Analyzed: 4/19/2021

PCBs

Analyte	Sample Result	MS Added	MS Result	MS % Recovery	MSD Added	MSD Result	MSD % Recovery	% Rec. Limits	MS Outlier	MSD Outlier	Relative % Diff.	RPD Limit	RPD Outlier
PCB-1016/1260	< 0.350	mg/Kg	1.72	1.16	67.6	1.77	0.904	51.1	12.9 - 96.3		27.8	82.9	

Method Reference(s): EPA 8082A
 EPA 3546
Preparation Date: 4/19/2021
 1
QC Batch ID: QC210419PCBS

Any estimated values are displayed, and derived values calculated, based on numeric result only. See primary analytical report for data flags.

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QC Report for Sample Spike and Sample Duplicate

Client: Inventum Engineering, P.C.

Lab Project ID: 211570

Project Reference: Riverview

Lab Sample ID: 211570-01
Sample Identifier: SD-NSP-04142021-14.5
Matrix: Sludge

Date Sampled: 4/14/2021
Date Received: 4/16/2021

Total Cyanide

<u>Analyte</u>	<u>Sample Results</u>	<u>Result Units</u>	<u>Spike Added</u>	<u>Spike Result</u>	<u>Spike % Recovery</u>	<u>% Rec Limits</u>	<u>Spike Outliers</u>	<u>Duplicate Result</u>	<u>Relative % Difference</u>	<u>RPD Limit</u>	<u>RPD Outliers</u>	<u>Date Analyzed</u>
Cyanide, Total	14.5	mg/Kg	11.1	21.2	60.8	80 - 120	*	12.2	17.1	20		4/21/2021
Method Reference(s):	EPA 9014 EPA 9010C											
Preparation Date:	4/21/2021											
QC Batch ID:	QC210421STCN											

NC = Not Calculable. Applicable to RPD if sample or duplicate result is non-detect or estimated (see primary report for data flags). Applicable to MS if sample is greater or equal to ten times the spike added.

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Analytical Report Appendix

The reported results relate only to the samples as they have been received by the laboratory.

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All soil/sludge samples have been reported on a dry weight basis, unless qualified "reported as received". Other solids are reported as received.

Low level Volatiles blank reports for soil/solid matrix are based on a nominal 5 gram weight. Sample results and reporting limits are based on actual weight, which may be more or less than 5 grams.

The Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt. Sample condition requirements are defined under the 2003 NELAC Standard, sections 5.5.8.3.1 and 5.5.8.3.2.

NYSDOH ELAP does not certify for all parameters. Paradigm Environmental Services or the indicated subcontracted laboratory does hold certification for all analytes where certification is offered by ELAP unless otherwise specified. Aliquots separated for certain tests, such as TCLP, are indicated on the Chain of Custody and final reports with an "A" suffix.

Data qualifiers are used, when necessary, to provide additional information about the data. This information may be communicated as a flag or as text at the bottom of the report. Please refer to the following list of analyte-specific, frequently used data flags and their meaning:

"<" = Analyzed for but not detected at or above the quantitation limit.

"E" = Result has been estimated, calibration limit exceeded.

"Z" = See case narrative.

"D" = Sample, Laboratory Control Sample, or Matrix Spike Duplicate results above Relative Percent Difference limit.

"M" = Matrix spike recoveries outside QC limits. Matrix bias indicated.

"B" = Method blank contained trace levels of analyte. Refer to included method blank report.

"J" = Result estimated between the quantitation limit and half the quantitation limit.

"L" = Laboratory Control Sample recovery outside accepted QC limits.

"P" = Concentration differs by more than 40% between the primary and secondary analytical columns.

"NC" = Not calculable. Applicable to RPD if sample or duplicate result is non-detect or estimated (see primary report for data flags). Applicable to MS if sample is greater or equal to ten times the spike added. Applicable to sample surrogates or MS if sample dilution is 10x or higher.

"" = Indicates any recoveries outside associated acceptance windows. Surrogate outliers in samples are presumed matrix effects. LCS demonstrates method compliance unless otherwise noted.*

"(1)" = Indicates data from primary column used for QC calculation.

"A" = denotes a parameter for which ELAP does not offer approval as part of their laboratory certification program.

"F" = denotes a parameter for which Paradigm does not carry certification, the results for which should therefore only be used where ELAP certification is not required, such as personal exposure assessment.

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GENERAL TERMS AND CONDITIONS

LABORATORY SERVICES

These Terms and Conditions embody the whole agreement of the parties in the absence of a signed and executed contract between the Laboratory (LAB) and Client. They shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties. The LAB specifically rejects all additional, inconsistent, or conflicting terms, whether printed or otherwise set forth in any purchase order or other communication from the Client to the LAB. The invalidity or unenforceability in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder of the Terms and Conditions. No waiver by LAB of any provision, term, or condition hereof or of any breach by or obligation of the Client hereunder shall constitute a waiver of such provision, term, or condition on any other occasion or a waiver of any other breach by or obligation of the Client. This agreement shall be administered and interpreted under the laws of the state which services are procured.

Warranty.

Recognizing that the nature of many samples is unknown and that some may contain potentially hazardous components, LAB warrants only that it will perform testing services, obtain findings, and prepare reports in accordance with generally accepted analytical laboratory principles and practices at the time of performance of services. LAB makes no other warranty, express or implied.

Scope and Compensation.

LAB agrees to perform the services described in the chain of custody to which these terms and conditions are attached. Unless the parties agree in writing to the contrary, the duties of LAB shall not be construed to exceed the services specifically described. LAB will use LAB default method for all tests unless specified otherwise on the Work Order.

Payment terms are net 30 days from the date of invoice. All overdue payments are subject to an interest charge of one and one-half percent (1-1/2%) per month or a portion thereof. Client shall also be responsible for costs of collection, including payment of reasonable attorney fees if such expense is incurred. The prices, unless stated, do not include any sale, use or other taxes. Such taxes will be added to invoice prices when required.

Prices.

Compensation for services performed will be based on the current Lab Analytical Fee Schedule or on quotations agreed to in writing by the parties. Turnaround time based charges are determined from the time of resolution of all work order questions. Testimony, court appearances or data compilation for legal action will be charged separately. Evaluation and reporting of initial screening runs may incur additional fees.

Limitations of Liability.

In the event of any error, omission, or other professional negligence, the sole and exclusive responsibility of LAB shall be to re-perform the deficient work at its own expense and LAB shall have no other liability whatsoever. All claims shall be deemed waived unless made in writing and received by LAB within ninety (90) days following completion of services.

LAB shall have no liability, obligation, or responsibility of any kind for losses, costs, expenses, or other damages (including but not limited to any special, direct, incidental or consequential damages) with respect to LAB's services or results.

All results provided by LAB are strictly for the use of its clients and LAB is in no way responsible for the use of such results by clients or third parties. All reports should be considered in their entirety, and LAB is not responsible for the separation, detachment, or other use of any portion of these reports. Client may not assign the lab report without the written consent of the LAB.

Client covenants and agrees, at its/his/her sole expense, to indemnify, protect, defend, and save harmless the LAB from and against any and all damages, losses, liabilities, obligations, penalties, claims, litigation, demands, defenses, judgments, suits, actions, proceedings, costs, disbursements and/or expenses (including, without limitation attorneys' and experts' fees and disbursements) of any kind whatsoever which may at any time be imposed upon, incurred by or asserted or awarded against client relating to, resulting from or arising out of (a) the breach of this agreement by this client, (b) the negligence of the client in handling, delivering or disclosing any hazardous substance, (c) the violation of the Client of any applicable law, (d) non-compliance by the Client with any environmental permit or (e) a material misrepresentation in disclosing the materials to be tested.

Hazard Disclosure.

Client represents and warrants that any sample delivered to LAB will be preceded or accompanied by complete written disclosure of the presence of any hazardous substances known or suspected by Client. Client further warrants that any sample containing any hazardous substance that is to be delivered to LAB will be packaged, labeled, transported, and delivered properly and in accordance with applicable laws.

Sample Handling.

Prior to LAB's acceptance of any sample (or after any revocation of acceptance), the entire risk of loss or of damage to such sample remains with Client. Samples are accepted when receipt is acknowledged on chain of custody documentation. In no event will LAB have any responsibility for the action or inaction of any carrier shipping or delivering any sample to or from LAB premises.

Client authorizes LAB to proceed with the analysis of samples as received by the laboratory, recognizing that any samples not in compliance with all current DOH-ELAP-NELAP requirements for containers, preservation or holding time will be noted as such on the final report.

Disposal of hazardous waste samples is the responsibility of the Client. If the Client does not wish such samples returned, LAB may add storage and disposal fees to the final invoice. Maximum storage time for samples is 30 days after completion of analysis unless modified by applicable state or federal laws. Client will be required to give the LAB written instructions concerning disposal of these samples.

LAB reserves the absolute right, exercisable at any time, to refuse to receive delivery of, refuse to accept, or revoke acceptance of any sample, which, in the sole judgment of LAB (a) is of unsuitable volume, (b) may be or become unsuitable for or may pose a risk in handling, transport, or processing for any health, safety, environmental or other reason whether or not due to the presence in the sample of any hazardous substance, and whether or not such presence has been disclosed to LAB by Client or (c) if the condition or sample date make the sample unsuitable for analysis.

Legal Responsibility.

LAB is solely responsible for performance of this contract, and no affiliated company, director, officer, employee, or agent shall have any legal responsibility hereunder, whether in contract or tort including negligence.

Assignment.

LAB may assign its performance obligations under this contract to other parties, as it deems necessary. LAB shall disclose to Client any assignee (subcontractor) by ELAP ID # on the submitted final report.

Force Majeure.

LAB shall have no responsibility or liability to the Client for any failure or delay in performance by LAB, which results in whole or in part from any cause or circumstance beyond the reasonable control of LAB. Such causes and circumstances shall include, but not limited to, acts of God, acts or orders of any government authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, difficulties or delays in transportation, mail or delivery services, inability to obtain sufficient services or supplies from LAB's usual suppliers, or any other cause beyond LAB's reasonable control.

Law.

This contract shall be continued under the laws of the State of New York without regard to its conflicts of laws provision.

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.

Report Prepared Tuesday, April 27, 2021



Chain of Custody Supplement

Client: Inventum Engineering Completed by: Glenn Pezzulo
 Lab Project ID: 211570 Date: 4/16/21

Sample Condition Requirements
 Per NELAC/ELAP 210/241/242/243/244

Condition	NELAC compliance with the sample condition requirements upon receipt		
	Yes	No	N/A
Container Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Transferred to method-compliant container	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Headspace (<1 mL)	<input type="checkbox"/>	<input checked="" type="checkbox"/> TCLP VOA	<input checked="" type="checkbox"/>
Comments	_____		
Preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Chlorine Absent (<0.10 ppm per test strip)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments	_____		
Holding Time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		
Temperature	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> metals
Comments	<u>2°C iced</u>		
Compliant Sample Quantity/Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	_____		

L2119020



CHAIN OF CUSTODY

REPORT TO:		INVOICE TO:		LAB PROJECT ID	
CLIENT:	Paradigm Environmental	CLIENT:	Same		
ADDRESS:	179 Lake Ave	ADDRESS:			
CITY:	Rochester STATE: NY ZIP: 14608	CITY:	STATE: ZIP:	Quotation #:	
PHONE:		PHONE:		Email:	
ATTN:	Reporting	ATTN:		reporting@paradigmenv.com	
Matrix Codes: AQ - Aqueous Liquid WA - Water DW - Drinking Water SO - Soil SD - Solid WP - Wipe OL - Oil NQ - Non-Aqueous Liquid WG - Groundwater WW - Wastewater SL - Sludge PT - Paint CK - Caulk AR - Air					

PROJECT REFERENCE
Riverview

REQUESTED ANALYSIS									
DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX	CONTAINERS	REACTIVITY	REMARKS	PARADIGM LAB SAMPLE NUMBER
4/14/21	15:00		✓	SD-MSP-04142021	SL		X		
	14:00		✓	SD-BX-STAB-041421	SD		X		
	12:00		✓	SD-CY-04142021	SD		X		

Turnaround Time	Report Supplements	
Availability contingent upon lab approval; additional fees may apply.		
Standard 5 day <input checked="" type="checkbox"/>	None Required <input type="checkbox"/>	None Required <input type="checkbox"/>
10 day <input type="checkbox"/>	Batch QC <input checked="" type="checkbox"/>	Basic EDD <input type="checkbox"/>
Rush 3 day <input type="checkbox"/>	Category A <input type="checkbox"/>	NYSDEC EDD <input checked="" type="checkbox"/>
Rush 2 day <input type="checkbox"/>	Category B <input type="checkbox"/>	
Rush 1 day <input type="checkbox"/>		
Other <input type="checkbox"/>	Other <input type="checkbox"/>	Other EDD <input type="checkbox"/>
<small>please indicate date needed:</small>	<small>please indicate package needed:</small>	<small>please indicate EDD needed:</small>

Client

Sampled By	Date/Time	Total Cost:
<i>Brainyard</i>	4/14/21 16:45	<input type="text"/>
Relinquished By	Date/Time	P.I.F.
<i>WJY</i>	4/14/21 1645	<input type="text"/>
Received By	Date/Time	
<i>WJY</i>	4/14/21 1645	
Received @ Lab By	Date/Time	
<i>relinquished by</i>	4/15/21 01:10	

By signing this form, client agrees to Paradigm Terms and Conditions (reverse).