Environmental Remediation Group

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SENT VIA OVERNIGHT COURIER AND FILE TRANSFER PORTAL

February 24, 2020

Mr. Brian Sadowski
Division of Environmental Remediation
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203-2999

Re: Charles Gibson Site, Niagara Falls, New York
Site No. 932063
Annual Periodic Review Report – 2019
Post Closure Operation, Maintenance, and Monitoring Activities

Dear Mr. Sadowski:

Olin hereby submits a CD containing a PDF of the 2019 Annual Periodic Review Report on the Post-Closure Operation, Maintenance, and Monitoring activities for the Charles Gibson Site. The annual certification is attached as hard copy and as part of the PDF. The full document is also available via Olin's File Transfer Portal.

Please direct any questions or comments to me at 423/336-4057 or by email at abcarringer@olin.com.

Sincerely,
OLIN CORPORATION

Adam Carringer
Sr. Environmental Specialist

Charles Gibson Site
Site No. 932063
Periodic Review Report

February 24, 2020

TABLE OF CONTENTS

ATTACHMENTS

I. INTRODUCTION

Brief Summary, Nature and Extent, Remedial History:
Construction of the remedy on the Charles Gibson Site concluded in 1990. The remedy consisted of rerouting Cayuga Creek around and away from the waste, installation of a fully circumscribed soil-bentonite slurry wall barrier and installation of a double flexible membrane liner cap with a perimeter collection drain system. The first year of operations and maintenance (O&M) of the containment remedy for the site and the groundwater monitoring program began in 1993. Waters collected in the site perimeter collection drain system are managed by direct discharge to the City of Niagara Falls Wastewater Treatment Facility. The Charles Gibson site is classified as a commercial/small industrial/residential user (CSIRU) and does not require a permit.

Effectiveness of Remedial Program:
Groundwater monitoring indicates there are no increased concentrations of compounds being monitored. Evaluation of the monitor well and sediment analytical results indicate the containment remedy is effective. An evaluation of data from the piezometer pairs at the Site indicates that a materially inward hydraulic gradient has been established in the containment area of the site. The remedial program is achieving the objectives of containing groundwater flow and maintaining groundwater quality standards.

Compliance:
There are no areas of non-compliance.

Recommendations:
No recommendations. Conditions at the Site are stable.

II. SITE OVERVIEW

Site Description and Nature/Extent Prior to Remediation:
The Site as now defined incorporates approximately two acres bounded to the east and north by Cayuga Creek, to the west by Tuscarora Road and to the south by Niagara Mohawk Power Corporation right-of-way and the Auto Zone Incorporated auto parts store and parking lot. The Site cap is slightly mounded with the center of the capped area essentially flat. The capped area is enclosed by a chain link fence. A wooden privacy fence is immediately next to and outside of the chain link fence on portions of the perimeter.

Remediation Chronology:
The Agreement includes a provision in the event that after seven years following the delivery of a Release of Liability (issued December 15, 1992), Olin demonstrates that conditions at the Site are such that the stated frequency or duration of the requirements are no longer necessary to determine whether the remediation is effective, Olin may reduce the frequency and duration of such monitoring or inspections. Olin has submitted annual reports and has conducted the required monitoring for the duration of the remediation.

III. REMEDY PERFORMANCE, EFFECTIVENESS, AND PROTECTIVENESS

The work performed for the Site during 2019 was reviewed and found to be in accordance with the approved O&M Manual (Revised 2009) as well as the NYSDEC approved reduction in annual sampling dated April 25, 2013. Groundwater monitoring indicates there was an increase in some of the concentrations not previously seen at the site. Olin believes that this is an anomaly due to unusually high seasonal flooding. We will continue to monitor the results closely. Drawdown in both manholes was effectively maintained at specified levels throughout the year.

IV. IC/EC PLAN

IC/EC Requirements:

Fence is in place around the landfill, effectively restricting access

Clean soil cover is in place on the landfill, restricting infiltration and promoting runoff

A hydraulic control system is in place, effectively controlling groundwater flow direction

Certification:

Attachment A

V. MONITORING PLAN COMPLIANCE REPORT

Components of Monitoring Plan:

Operation, maintenance, and monitoring activities to be performed include:

- Performance of a groundwater monitoring program to monitor ground water quality at the site and to verify the inward hydraulic gradient within the capped area.

- The current groundwater level monitoring system for the Site consists of six piezometers (P-1 through P-6) and two manholes (A and B). Piezometers P-1, P-2 and Manhole A are located in the northeast section of the Site; P-3, P-4, and Manhole B are located in the southeast section; and P-5 and P-6 are located toward the southwest (see ***Attachment B***).

- All piezometers are constructed of Schedule 80 PVC and are 2 inches in diameter. Each piezometer has been constructed with 5 feet of screen and was screened at the water table.

- The construction of the piezometer screens at the water table allows for continued monitoring of the water table elevation inside and outside of the containment area during periods of water level fluctuations. Piezometers P-1, P-3, and P-5 are located outside of the slurry wall that runs along the perimeter of the Site. Piezometers P-2, P-4, and P-6 are inside the slurry wall and paired opposite the three piezometers outside the slurry wall.

- Water level elevations are measured quarterly at the Site in Manholes A and B and piezometers P-1 through P-6. Water level elevations are measured by means of an acoustical sounder or electronic water level probe. The sounder or probe is lowered into the manhole or piezometer until it makes contact with the free water surface. The depth

from the top of the piezometer riser pipe or manhole rim to the water surface is measured to an accuracy of 0.01 ft. Depth to water measurements are converted into mean sea level elevations by referring to the surveyed elevation of the top of the piezometer riser pipe or manhole rim provided on the Groundwater Elevation Form. The depth to water measurements for Manholes A and B are checked to see that they are not greater than 10.27 feet and 12.41 feet, respectively to ensure that the automatic sump pump is functioning.

Summary and Comparison to Remedial Objectives:

The isolation of groundwater within the capped area has been established in two of the three piezometer pairs and is being maintained by current operation and maintenance activities. The groundwater monitoring and sampling is performed on an annual basis in rotating quarters to help assess seasonal variability with Groundwater Sampling Field Parameters presented in **Attachment C**.

Currently two locations, immediately upstream and downstream of the Site and the adjacent remediated portion of the Cayuga Creek bed, are sampled once per year, in the Fall or 'low water' period. Beginning with the October 2000 sample event, annual creek sediment samples have been analyzed for BHC isomers only. Sample collection and analysis of creek sediments are performed annually during the second half of the calendar year. The 2019 upstream data demonstrates elevated concentrations of Alpha-BHC and Beta-BHC **(Table 3)**. The downstream sampling location had been washed away during flooding events resulting in a lack of sample. Olin believes the elevated results are a result of the flooding and we will continue to monitor the results closely.

The water elevation data collected from the piezometers and groundwater wells was used to determine whether an inward hydraulic gradient exists. Gradient direction was made by comparing water level measurements within the capped area to those measured outside the capped area. The groundwater elevation data indicates that groundwater within the capped area is consistent with historical data. An evaluation of data from the piezometer pairs at the Site indicates that two of the three piezometer pairs (P3/P4 and P5/P6) exhibited inward gradients during the year with exception of third quarter for piezometer pair P3/P4. However, P3/P4 returned to an inward gradient during the fourth quarter.

P1/P2 has historically shown fluctuations between inward and outward gradients. In 2019, outward gradients were observed in three of the quarters. We will continue to closely monitor this piezometer pair moving forward.
Drawdown in both manholes was effectively maintained at specified levels throughout the year. **Table 4** shows the most recent piezometric data.

Deficiencies:

None

Recommendations for Changes:

Due to the inconsistent nature of inward hydraulic gradient from piezometer pair P1/P2, we are lowering the sump pump in Manhole B to create a stronger inward hydraulic influence at the site.

VI. O&M PLAN COMPLIANCE REPORT

Components of the O&M Plan:

Site remediation requirements have been met by Olin through rerouting of Cayuga Creek around and away from the waste, by constructing a fully circumscribing soil-bentonite slurry wall barrier, and through installing a double flexible membrane liner cap as part of the final cover with a perimeter collection drain system. This O&M Plan safeguards that remedy and provides for monitoring of the Gibson Site in compliance with the Settlement Agreement.

Quarterly inspections of the Gibson Site are conducted to identify any potential problems with physical deterioration of structures, possible malfunctions of the slurry wall or of the perforated CPVC drain system, and to ensure that all site remedial measures components are operating effectively, in accordance with the Settlement Agreement.

The Environmental Inspector conducts the inspections to ensure that the remedial measures at the Site will remain operative. Additionally, the inspections address the safeguards to control, minimize or eliminate threats to human health and the environment. Operation, maintenance, and monitoring activities are conducted to identify proposed changes to the O&M Manual or site procedures which would provide a safer and/or more efficient and cost-effective operation.

Recordkeeping is conducted for each site visit and inspection.

Operation & Monitoring (O&M) Summary:

The groundwater collection system is inspected for the buildup of hard or soft scale-like deposits. The inspection is performed concurrently with inspection of the capped area. If a component of the groundwater collection system is found to be damaged or malfunctioning, it is repaired or replaced.

The capped area is mowed on a regular basis to prevent establishment of woody vegetation during this reporting period. The capped area functions as designed and complies with the O&M Plan.

Inspections are conducted using the items listed on the Site Inspection Form presented in ***Attachment D***. Information to be entered on these forms includes the inspector's name, date, and time of inspection, item inspected and any comments. The inspector indicates on the forms whether the condition of each item was acceptable or unacceptable to ensure that the requirements of this O&M Plan are fulfilled. The scheduled Site monitoring inspections are performed by a qualified individual assigned to inspect the items and systems noted on the Site Inspection Form. The completed Site Inspection Forms are maintained at Olin Environmental Remediation offices in Cleveland, TN. Inspections are performed, at a minimum, on a quarterly basis.

Evaluation of Remedial Systems:

All components are performing as designed.

O&M deficiencies:
None

Conclusions:
The O&M system is being run and maintained properly and does not require additions or modifications at this time.

VII. OVERALL PRR CONCLUSIONS AND RECOMMENDATIONS

Compliance with SMP:
Based on the operations and maintenance documentation listed above, the system requirements are being met. There are no new exposure pathways. Additional plans and modifications are not necessary.

Remedy Effectiveness:
The groundwater elevation data indicates that groundwater within the capped area is consistent with historical data and is being maintained by current operation and maintenance activities.

Review of the groundwater elevation data indicate that inward hydraulic gradients were observed between piezometers within the capped area and piezometers outside of the capped area with previously noted exceptions. Fluctuations of groundwater elevations indicate that minor outward hydraulic gradients historically occur, but typically revert back to inward gradients by the next quarter.

Currently two locations, immediately upstream and downstream of the Site and the adjacent remediated portion of the Cayuga Creek bed, are sampled once per year, in the Fall or 'low water' period. A sample is collected downstream of the Site to monitor changes in levels of contaminants in creek sediments, if any. The other sample, immediately upstream of the Site is used to monitor potential upstream contaminant sources or potential 'backwash' effects caused by the changing level of the Niagara River. Beginning with the October 2000 sample event, annual creek sediment samples have been analyzed for BHC isomers only. Downstream sample collection amounts were insufficient for analysis and the upstream analysis revealed concentrations of BHC that are not typical.

Based on the data developed to date, the remedy has been effective in attaining the remedial objectives.

Future Submittals:
Future submittals of this report will continue to be submitted annually.

Attachment A

Institutional & Engineering Certification Form

Enclosure 2

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

Site Details **Box 1**

Site No. **932063**

Site Name Charles Gibson Site

Site Address: N.E. Cnr. of Niagara Falls Blvd. & Tuscarora Rd. Zip Code: 14304
City/Town: Niagara Falls
County: Niagara
Site Acreage: 2.000

Reporting Period: January 31, 2019 to January 31, 2020

	YES	NO
1. Is the information above correct?	☑	☐
If NO, include handwritten above or on a separate sheet.		
2. Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment during this Reporting Period?	☐	☑
3. Has there been any change of use at the site during this Reporting Period (see 6NYCRR 375-1.11(d))?	☐	☑
4. Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property during this Reporting Period?	☐	☑
If you answered YES to questions 2 thru 4, include documentation or evidence that documentation has been previously submitted with this certification form.		
5. Is the site currently undergoing development?	☐	☑

Box 2

	YES	NO
6. Is the current site use consistent with the use(s) listed below? Closed Landfill	☑	☐
7. Are all ICs/ECs in place and functioning as designed?	☑	☐

IF THE ANSWER TO EITHER QUESTION 6 OR 7 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

Signature of Owner, Remedial Party or Designated Representative

Date

SITE NO. 932063

Box 3

Description of Institutional Controls

Parcel	Owner	Institutional Control
161.05-3-7	OLIN CORPORATION	Monitoring Plan O&M Plan

Consent Judgement 3/12/85 including IC stipulations p. 23 Permits and Easements, sections 11-24.
Operation and Maintenance Manual; September 30, 2009.
- Groundwater Quality Monitoring.
- Leachate Monitoring.
- Creek Sediment Monitoring.

161.05-5-12	OLIN CORPORATION	Monitoring Plan O&M Plan

Consent Judgment 3/12/85 including IC stipulations p. 23 Permits and Easements, sections 11-24.

- Groundwater Quality Monitoring.
- Leachate Monitoring.
- Creek Sediment Monitoring.

Box 4

Description of Engineering Controls

Parcel	Engineering Control
161.05-3-7	Cover System Groundwater Containment Leachate Collection Fencing/Access Control

- Realignment of Cayuga Creek from the waste.
- Fully circumscribed soil-bentonite slurry wall barrier.
- Double flexible membrane liner cap.
- Perimeter Leachate Collection System with discharge to NFWWTP.
- Final cover soil cap.
- Perimeter chain link and portions of wooden privacy fencing with locked gates.

161.05-5-12	Cover System Groundwater Containment Leachate Collection Fencing/Access Control

- Realignment of Cayuga Creek away from the waste.
- Fully circumscribed soil-bentonite slurry barrier wall.
- Double flexible membrane liner cap.
- Perimeter leachate collection system with discharge to the NFWWTP.
- Final soil cover cap.
- Perimeter chain link with portions of wooden privacy fencing with locked gates.

Box 5

Periodic Review Report (PRR) Certification Statements

1. I certify by checking "YES" below that:

   a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

   b) to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and compete.

YES	NO
☑	☐

2. If this site has an IC/EC Plan (or equivalent as required in the Decision Document), for each Institutional or Engineering control listed in Boxes 3 and/or 4, I certify by checking "YES" below that all of the following statements are true:

   (a) the Institutional Control and/or Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

   (b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

   (c) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;

   (d) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and

   (e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.

YES	NO
☑	☐

IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

Signature of Owner, Remedial Party or Designated Representative

Date

IC/EC CERTIFICATIONS

Box 7

Qualified Environmental Professional Signature

I certify that all information in Boxes 4 and 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I CARRIE A. HUNT (print name) at 3855 N. OCOEE ST., CLEVELAND, TN 37312 (print business address)

am certifying as a Qualified Environmental Professional for the OLIN CORPORATION (Owner or Remedial Party)

Signature of Qualified Environmental Professional, for the Owner or Remedial Party, Rendering Certification	Stamp (Required for PE)	Date
	CHMM # 11148	2/24/2020

IC CERTIFICATIONS
SITE NO. 932063

Box 6

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 1,2, and 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Adam B. Carringer at 3855 N. Ocoee St, Cleveland TN 37312,
print name print business address

am certifying as Own Corporation (Owner or Remedial Party)

for the Site named in the Site Details Section of this form.

Adam B Carringer 2/21/2020
Signature of Owner, Remedial Party, or Designated Representative Date
Rendering Certification

Attachment B

Site Features Map
Figure 1

FIGURE 1
Charles Gibson Site
Niagara Falls, NY
with Sampling Locations

Attachment C

Field Sampling Forms

U.S. Environmental
Rental Corporation

Calibration Report

Calibrated With Horiba Auto-Cal Solution

Lot Number 8GJ194

Parameter	Conductivity 4.49 ms/cm	PH 4.01
Reading Before	4.49	4.00
Reading After	4.49	4.00

Parameter	Turbidity 0 NTU	D.O. mg/L
Reading Before	0.00	9.82
Reading After	0.00	9.88

Serial #	VTBB5L7G
Tech Initials	MB
Date	5/15/19

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
GROUNDWATER AND SEDIMENT
SAMPLING FIELD FORM

RECORDED BY: C JONES
SAMPLED BY: C JONES
COMPANY: SEVENSON

SAMPLE ID: MH-B-052119
SAMPLING EVENT/DATE: ANNUAL GW 5/21/19
MONITORING WELL: MH-B
CONDITION: GOOD

GROUNDWATER PURGE DATA PURGE DATE:

DEPTH TO BOTTOM FROM TOP OF RISER: (FT.)
DEPTH TO WATER FROM TOP OF RISER: (FT.)
WATER COLUMN: (FT.)
2" DIA. WELL CONSTANT: 0.16
ONE WELL VOLUME= (GALS)

PURGE METHOD:
BOTTOM OF WELL/SILT BUILDUP:
PURGE START TIME: STOP TIME:
PURGE OBSERVATIONS:

NOTE: ALL GIBSON SITE MONITORING WELLS ARE 2-INCH DIAMETER STAIN-LESS STEEL. WELL DEPTHS:

MW-1R	12.10'
MW-2	12.13'
MW-A3	11.95'
MW-4	13.75'
MW-5	15.28'

FIELD PARAMETER MEASUREMENTS:

WELL VOLUME	pH	SPECIFIC CONDUCTIVITY umhos/cm)	TEMP. (C OR F)	NOTES:
1				
2				
3				
4				
5				

TOTAL VOLUME PURGED:

GROUNDWATER OR SEDIMENT SAMPLING DATA: SAMPLE DATE: 5/21/19

MEDIA: GROUNDWATER X
CREEK SEDIMENT

SAMPLE TIME: 930

LOCATION: SE LANDFILL

SAMPLE METHOD: PERISTALTIC PUMP / DEDICATED TUBING

SAMPLING OBSERVATIONS: CLEAR

QC SAMPLES TAKEN: Ø

OTHER OBSERVATIONS/COMMENTS: SAMPLED FOR BHC

Note: specific conductivity formula to 25 degrees Celcius: SC(25)= SC measured / {(T-25)(0.02)}+1

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
GROUNDWATER AND SEDIMENT
SAMPLING FIELD FORM

RECORDED BY: C JONES
SAMPLED BY: C JONES
COMPANY: SEVENSON

SAMPLE ID: MW-4-052119
SAMPLING EVENT/DATE: ANNUAL GW
MONITORING WELL: MW-4
CONDITION: GOOD

GROUNDWATER PURGE DATA PURGE DATE:

DEPTH TO BOTTOM FROM TOP OF RISER: 13.75 (FT.)
DEPTH TO WATER FROM TOP OF RISER: 7.19 (FT.)
WATER COLUMN: 6.56 (FT.)
2" DIA. WELL CONSTANT: 0.16
ONE WELL VOLUME= 1.05 (GALS)

NOTE: ALL GIBSON SITE MONITORING WELLS ARE 2-INCH DIAMETER STAIN-LESS STEEL. WELL DEPTHS:

MW-1R	12.10'
MW-2	12.13'
MW-A3	11.95'
MW-4	(13.75')
MW-5	15.28'

PURGE METHOD: PERASTALTIC PUMP / DEDICATED TUBING
BOTTOM OF WELL/SILT BUILDUP: SLIGHT
PURGE START TIME: 1135 STOP TIME: 1206
PURGE OBSERVATIONS: ISO → CLEAR SLIGHT ODOR

FIELD PARAMETER MEASUREMENTS:

WELL VOLUME		pH	SPECIFIC CONDUCTIVITY umhos/cm)	TEMP. (C OR F)	NOTES:
0	1	7.01	.197	11.2	INITIAL SEDIMENT DISCHARGE
1	2	7.29	.231	11.0	CLEAR
2	3	7.36	.239	11.0	CLEAR
3	4	7.39	.244	10.9	CLEAR
	5				

TOTAL VOLUME PURGED: 3.5 gallons

GROUNDWATER OR SEDIMENT SAMPLING DATA: SAMPLE DATE: 5/21/19

MEDIA: GROUNDWATER X
CREEK SEDIMENT

SAMPLE TIME: 1210

LOCATION: EAST OF AUTO ZONE

SAMPLE METHOD: PERASTALTIC PUMP / DEDICATED TUBING

SAMPLING OBSERVATIONS: CLEAR

QC SAMPLES TAKEN: MS / MSD DUPE

OTHER OBSERVATIONS/COMMENTS: SAMPLED FOR BHC

EB60 FIELD BLANK TAKEN AT 1230

Note: specific conductivity formula to 25 degrees Celcius: SC(25)= SC measured / {(T-25)(0.02)}+1

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
GROUNDWATER AND SEDIMENT
SAMPLING FIELD FORM

RECORDED BY: C JONES
SAMPLED BY: C JONES
COMPANY: STEVENSON

SAMPLE ID: MW-5-052119
SAMPLING EVENT/DATE: ANNUAL GW 5/21/19
MONITORING WELL: MW-5
CONDITION: GOOD

GROUNDWATER PURGE DATA PURGE DATE:

DEPTH TO BOTTOM FROM TOP OF RISER: 15.28 (FT.)
DEPTH TO WATER FROM TOP OF RISER: 6.79 (FT.)
WATER COLUMN: 8.49 (FT.)
2" DIA. WELL CONSTANT: 0.16
ONE WELL VOLUME= 1.35 (GALS)

NOTE: ALL GIBSON SITE MONITORING WELLS ARE 2-INCH DIAMETER STAIN-LESS STEEL. WELL DEPTHS:

MW-1R	12.10'
MW-2	12.13'
MW-A3	11.95'
MW-4	13.75'
MW-5	15.28'

PURGE METHOD: PERISTALTIC PUMP/ DEDICATED TUBING
BOTTOM OF WELL/SILT BUILDUP: NONE
PURGE START TIME: 1019 STOP TIME: 1040
PURGE OBSERVATIONS: CLEAR, NO ODOR

FIELD PARAMETER MEASUREMENTS:

WELL VOLUME		pH	SPECIFIC CONDUCTIVITY umhos/cm)	TEMP. (C OR F)	NOTES:
0	1	6.94	.258	11.2	CLEAR
1.5	2	7.11	.350	11.0	CLEAR
3.0	3	7.18	.354	11.0	CLEAR
4.5	4	7.26	.359	10.8	CLEAR
	5				

TOTAL VOLUME PURGED: 5 gallons

GROUNDWATER OR SEDIMENT SAMPLING DATA: SAMPLE DATE: 5/21/19

MEDIA: GROUNDWATER X
CREEK SEDIMENT

SAMPLE TIME: 1045

LOCATION: NE OF AUTO ZONE

SAMPLE METHOD: PERISTALTIC PUMP / DEDICATED TUBING

SAMPLING OBSERVATIONS: CLEAR

QC SAMPLES TAKEN: DUPLICATE TAKEN HERE LABELED "MW-7-052119" TIME 1111

OTHER OBSERVATIONS/COMMENTS: SAMPLED FOR BHC

Note: specific conductivity formula to 25 degrees Celcius: SC(25)= SC measured / {(T-25)(0.02)}+1

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
GROUNDWATER AND SEDIMENT
SAMPLING FIELD FORM

RECORDED BY: C Jones
SAMPLED BY: C Jones
COMPANY: SEVENSON

SAMPLE ID: MWA3-052119
SAMPLING EVENT/DATE: ANNUAL GW 5/21/19
MONITORING WELL: MWA3
CONDITION: GOOD

GROUNDWATER PURGE DATA PURGE DATE:

DEPTH TO BOTTOM FROM TOP OF RISER: (FT.)
DEPTH TO WATER FROM TOP OF RISER: (FT.)
WATER COLUMN: (FT.)
2" DIA. WELL CONSTANT: 0.16
ONE WELL VOLUME= (GALS)

PURGE METHOD: DRY NO SAMPLE
BOTTOM OF WELL/SILT BUILDUP:
PURGE START TIME: STOP TIME:
PURGE OBSERVATIONS:

NOTE: ALL GIBSON SITE MONITORING WELLS ARE 2-INCH DIAMETER STAIN-LESS STEEL. WELL DEPTHS:

MW-1R	12.10'
MW-2	12.13'
MW-A3	11.95'
MW-4	13.75'
MW-5	15.28'

FIELD PARAMETER MEASUREMENTS:

WELL VOLUME	pH	SPECIFIC CONDUCTIVITY umhos/cm)	TEMP. (C OR F)	NOTES:
1				
2				
3				
4				
5				

TOTAL VOLUME PURGED:

GROUNDWATER OR SEDIMENT SAMPLING DATA: SAMPLE DATE:

MEDIA: GROUNDWATER _____ SAMPLE TIME:
CREEK SEDIMENT _____

LOCATION:

SAMPLE METHOD:

SAMPLING OBSERVATIONS:

QC SAMPLES TAKEN:

OTHER OBSERVATIONS/COMMENTS: DRY NO SAMPLE TAKEN

Note: specific conductivity formula to 25 degrees Celcius: SC(25)= SC measured / {(T-25)(0.02)}+1

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM 57037

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE 1 OF 1

Project Name: OLIN - CHARLES GIBSON	Project Number: 1209
Project Manager: ADAM CARLINGER	Report CC: ADAM CARLINGER - OLIN
Company/Address: OLIN CORP 3855 NORTH OCOEE ST SUITE 200 CLEVELAND TN 37312	
Phone #: (423) 336-4987	Email: ABcarlringer@Olin.com
Sampler's Signature:	Sampler's Printed Name: CHRIS JONES

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

PRESERVATIVE

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOAs ○ 8260 ○ 624 ○ CLP	GC/MS SVOAs ○ 8270 ○ 625	GC VOAs ○ 8021 ○ 601/602	PESTICIDES ○ 8081 ○ 608	PCBs ○ 8082 ○ 608	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	REMARKS/ ALTERNATE DESCRIPTION
MW-B-052119		5/21/19	930	GW	2				2				
MW-4-052119			1210		4				4				MS/MSD VOLUME
FIELD BLANK-052119			1230		1				1				
MW-5-052119			1045		2				2				
MW-7-052119			1111		2				2				

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

SPECIAL INSTRUCTIONS/COMMENTS
Metals
SHIPPED IN 1 COOLER

See QAPP ☐

TURNAROUND REQUIREMENTS
_____ RUSH (SURCHARGES APPLY)
_____ 1 day _____ 2 day _____ 3 day
_____ 4 day _____ 5 day
_____ Standard (10 business days-No Surcharge)
REQUESTED REPORT DATE
STANDARD

REPORT REQUIREMENTS
_____ I. Results Only
X II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
_____ III. Results + QC and Calibration Summaries
_____ IV. Data Validation Report with Raw Data
Edata _____ Yes _____ No

INVOICE INFORMATION
PO # REIW 0005
BILL TO: OLIN

STATE WHERE SAMPLES WERE COLLECTED NY

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	UPS	Signature	Signature	Signature	Signature
Printed Name: CHRIS JONES	Printed Name	Printed Name	Printed Name	Printed Name	Printed Name
Firm: SEVENSON	Firm	Firm	Firm	Firm	Firm
Date/Time: 5/21/19 1500	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

Distribution: White - Lab Copy; Yellow - Return to Originator

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
GROUNDWATER AND SEDIMENT
SAMPLING FIELD FORM

RECORDED BY: Jones **SAMPLE ID:** US-1-092619

SAMPLED BY: Jones SAMPLING EVENT/DATE: 9/26/2019

COMPANY: Sevenson MONITORING WELL: x

CONDITION: x

GROUNDWATER PURGE DATA PURGE DATE:

DEPTH TO BOTTOM FROM TOP OF RISER: (FT.)

DEPTH TO WATER FROM TOP OF RISER: (FT.)

WATER COLUMN: (FT.)

2" DIA. WELL CONSTANT: 0.16

ONE WELL VOLUME= (GALS)

PURGE METHOD:

BOTTOM OF WELL/SILT BUILDUP:

PURGE START TIME: STOP TIME:

PURGE OBSERVATIONS:

NOTE: ALL GIBSON SITE MONITORING WELLS ARE 2-INCH DIAMETER STAIN-LESS STEEL. WELL DEPTHS:

MW-1R	12.10'
MW-2	12.13'
MW-A3	11.95'
MW-4	13.75'
MW-5	15.28'

FIELD PARAMETER MEASUREMENTS:

WELL VOLUME	pH	SPECIFIC CONDUCTIVITY umhos/cm)	TEMP. (C OR F)	NOTES:
1				
2				
3				
4				
5				

TOTAL VOLUME PURGED:

GROUNDWATER OR SEDIMENT SAMPLING DATA: SAMPLE DATE: 9/26/2019

MEDIA: GROUNDWATER
CREEK SEDIMENT x

SAMPLE TIME: 1000

LOCATION: West of landfill Upstream sediment trap

SAMPLE METHOD: Grab taken from Sediment trap in creekbed.

SAMPLING OBSERVATIONS:

QC SAMPLES TAKEN: None

OTHER OBSERVATIONS/COMMENTS: Sample collected at 10:00 am, then trap replaced in creek for next year.

Note: specific conductivity formula to 25 degrees Celcius: $SC(25) = \frac{SC\ measured}{\{(T-25)(0.02)\}+1}$

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
GROUNDWATER AND SEDIMENT
SAMPLING FIELD FORM

RECORDED BY: Jones
SAMPLE ID: DS-1-100819
SAMPLED BY: Jones
SAMPLING EVENT/DATE: 10/8/2019
COMPANY: Sevenson
MONITORING WELL: x
CONDITION: x

GROUNDWATER PURGE DATA PURGE DATE:

DEPTH TO BOTTOM FROM TOP OF RISER: (FT.)
DEPTH TO WATER FROM TOP OF RISER: (FT.)
WATER COLUMN: (FT.)
2" DIA. WELL CONSTANT: 0.16
ONE WELL VOLUME= (GALS)

PURGE METHOD:
BOTTOM OF WELL/SILT BUILDUP:
PURGE START TIME: STOP TIME:
PURGE OBSERVATIONS:

NOTE: ALL GIBSON SITE MONITORING WELLS ARE 2-INCH DIAMETER STAIN-LESS STEEL. WELL DEPTHS:

MW-1R	12.10'
MW-2	12.13'
MW-A3	11.95'
MW-4	13.75'
MW-5	15.28'

FIELD PARAMETER MEASUREMENTS:

WELL VOLUME	pH	SPECIFIC CONDUCTIVITY umhos/cm)	TEMP. (C OR F)	NOTES:
1				
2				
3				
4				
5				

TOTAL VOLUME PURGED:

GROUNDWATER OR SEDIMENT SAMPLING DATA: SAMPLE DATE: 10/8/2019

MEDIA: GROUNDWATER
CREEK SEDIMENT x
SAMPLE TIME: None Taken

LOCATION: EAST of landfill Downstream sediment trap

SAMPLE METHOD: Sediment trap

SAMPLING OBSERVATIONS: **Trap found upright in creek with no sediment present**

QC SAMPLES TAKEN: 0

OTHER OBSERVATIONS/COMMENTS: **NO SAMPLE TAKEN**

Note: specific conductivity formula to 25 degrees Celcius: SC(25)= $\frac{SC\ measured}{\{(T-25)(0.02)\}+1}$

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM 58942

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE 1 OF 1

Project Name: CHARLES GIBSON	Project Number: 1209
Project Manager: ADAM CARRINGER	Report CC: ABCarringer@Olin.com
Company/Address: OLIN CORP 3855 NORTH OCOEE ST SUITE 200 CLEVELAND TN 37312	
Phone #: 423 336 4989	Email: ABCarringer@Olin.com
Sampler's Signature:	Sampler's Printed Name: CHRIS JONES

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

PRESERVATIVE

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOAs @ 8260 @ 624 @ CLP	GC/MS SVOAs @ 8270 @ 625	GC VOAs @ 8021 @ 601/602	PESTICIDES @ 8081 @ 608	PCBs @ 8082 @ 608	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	REMARKS/ ALTERNATE DESCRIPTION
US-1-092619		9/26	1030	SED	1				1				
TEMP BLANK		—	—	—	1								PROVIDED BY LAB

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☐

TURNAROUND REQUIREMENTS
_____ RUSH (SURCHARGES APPLY)
_____ 1 day _____ 2 day _____ 3 day
_____ 4 day _____ 5 day
_____ Standard (10 business days-No Surcharge)
REQUESTED REPORT DATE
STANDARD

REPORT REQUIREMENTS
_____ I. Results Only
X II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
_____ III. Results + QC and Calibration Summaries
_____ IV. Data Validation Report with Raw Data
Edata _____ Yes _____ No

INVOICE INFORMATION
PO # ALEN 0005
BILL TO OLIN

STATE WHERE SAMPLES WERE COLLECTED

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature:	UPS				
Printed Name: John Wright					
Firm: SEVERN					
Date/Time: 9/30/19 10:30					

Distribution: White - Lab Copy; Yellow - Return to Originator

Attachment D

Site Inspection Forms

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
SITE INSPECTION FORM

THIS FORM TO BE USED FOR QUARTERLY AND ALL OTHER SITE INSPECTIONS

DATE: 3/14/19 TIME: 830

INSPECTOR: CHRIS JONES COMPANY: SEVENSON

WEATHER: 55° PARTLY CLOUDY

REASON FOR INSPECTION (QUARTERLY OR OTHER): 1st QUARTER INSPECTION

GENERAL SITE CONDITIONS: U=UNACCEPTABLE A=ACCEPTABLE

(Note: For general site conditions note existence of bare areas (number,size), cracks, subsidence (sinking), ponded water, stressed vegetation, soil discoloration or seeps, and rodent burrows. For site security, note absence of locks, gates open or damaged, missing signs or evidence of vandalism. Note any other unusual occurences.)

		COMMENTS
ACCESS ROAD	A	REMOVED DOWN BRANCHES
COVER VEGETATION	A	
TREES	A	
LITTER	A	PICKED UP MINIMAL DEBRIS
EROSION (CAP)	A	
EROSION (BANK)	A	
SECURITY:		
FENCE/LOCKS	A	
PIEZOMETERS/LOCKS	A	
MONITORING WELLS/LOCKS	A	
MANHOLES/LIDS/LOCKS	A	
ELECTRICAL PANEL	A	

ADDITIONAL COMMENTS:

FRONT GATE DOES NOT PROPERLY CLOSE POSSIBLE DAMAGE DUE TO WIND STORM. BRIAN SADOWSKI FROM THE DEC WAS ON SITE. HE RECOMMENDED PLACING LARGE ROCKS ON NORTH SLOPE. ALSO REPLACING CONCRETE FOUNDATIONS ON FENCE POSTS ON NORTHERN PARAMETER

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
SITE INSPECTION FORM

THIS FORM TO BE USED FOR QUARTERLY AND ALL OTHER SITE INSPECTIONS

DATE: 5/21/19 TIME: 800

INSPECTOR: C JONES COMPANY: STEVENSON

WEATHER: 55° SUNNY

REASON FOR INSPECTION (QUARTERLY OR OTHER): ANNUAL GROUND WATER SAMPLING

GENERAL SITE CONDITIONS: U=UNACCEPTABLE A=ACCEPTABLE

(Note: For general site conditions note existence of bare areas (number,size), cracks, subsidence (sinking), ponded water, stressed vegetation, soil discoloration or seeps, and rodent burrows. For site security, note absence of locks, gates open or damaged, missing signs or evidence of vandalism. Note any other unusual occurences.)

		COMMENTS
ACCESS ROAD	A	
COVER VEGETATION	A	
TREES	A	
LITTER	A	
EROSION (CAP)	A	
EROSION (BANK)	A	

SECURITY:

FENCE/LOCKS	A	
PIEZOMETERS/LOCKS	A	
MONITORING WELLS/LOCKS	A	
MANHOLES/LIDS/LOCKS	A	
ELECTRICAL PANEL	A	

ADDITIONAL COMMENTS:

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
SITE INSPECTION FORM

THIS FORM TO BE USED FOR QUARTERLY AND ALL OTHER SITE INSPECTIONS

DATE: 10/10/2019 TIME: 900

INSPECTOR: Jones, Walker COMPANY: Sevenson

WEATHER: 65 sunny

REASON FOR INSPECTION (QUARTERLY OR OTHER): annual sediment sampling

GENERAL SITE CONDITIONS: U=UNACCEPTABLE A=ACCEPTABLE

(Note: For general site conditions note existence of bare areas (number,size), cracks, subsidence (sinking), ponded water, stressed vegetation, soil discoloration or seeps, and rodent burrows. For site security, note absence of locks, gates open or damaged, missing signs or evidence of vandalism. Note any other unusual occurences.)

		COMMENTS
ACCESS ROAD	A	
COVER VEGETATION	A	
TREES	A	
LITTER	A	
EROSION (CAP)	A	
EROSION (BANK)	A	

SECURITY:

FENCE/LOCKS	A	
PIEZOMETERS/LOCKS	A	
MONITORING WELLS/LOCKS	A	
MANHOLES/LIDS/LOCKS	A	
ELECTRICAL PANEL	A	

ADDITIONAL COMMENTS: On 9/26/19 Sevenson collected a sample from the upstream sediment trap but was unable to collect a sample from the downstream trap due to high creek water level. Sevenson returned to the site several times and was able to retrieve the downstream trap on 10/8/19. **The trap was found upright in the creek but empty, no sample was taken*.** On 10/10/19 Sevenson took the GPS coordinates for the sediment traps (see attached photo). The results were

UPSTREAM 43 degrees 05.582 N 78 degrees 57.872 W
DOWNSTREAM 43 degrees 05.572 N 78 degrees 57.791 W

* Adam Carringer was notified of the lack of sediment material upon discovery .

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
SITE INSPECTION FORM

THIS FORM TO BE USED FOR QUARTERLY AND ALL OTHER SITE INSPECTIONS

DATE: 10-30-19 TIME: 0800

INSPECTOR: MICHAEL WALKER COMPANY: SEVERSON

WEATHER: CLOUDY 53°F

REASON FOR INSPECTION (QUARTERLY OR OTHER): REPAIR BROKEN WELL HEAD

GENERAL SITE CONDITIONS: U=UNACCEPTABLE A=ACCEPTABLE

(Note: For general site conditions note existence of bare areas (number,size), cracks, subsidence (sinking), ponded water, stressed vegetation, soil discoloration or seeps, and rodent burrows. For site security, note absence of locks, gates open or damaged, missing signs or evidence of vandalism. Note any other unusual occurences.)

		COMMENTS
ACCESS ROAD	A	
COVER VEGETATION	A	
TREES	A	
LITTER	A	
EROSION (CAP)	A	
EROSION (BANK)	A	
SECURITY:		
FENCE/LOCKS	A	
PIEZOMETERS/LOCKS	A	
MONITORING WELLS/LOCKS	A	
MANHOLES/LIDS/LOCKS	A	
ELECTRICAL PANEL	A	

ADDITIONAL COMMENTS: WALKER ON SITE TO REPAIR/REPLACE WELL HEAD COVER ON P3.

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
SITE INSPECTION FORM

THIS FORM TO BE USED FOR QUARTERLY AND ALL OTHER SITE INSPECTIONS

DATE: 11/6/2019 TIME: 930

INSPECTOR: C Jones COMPANY: Sevenson

WEATHER: 34 sunny

REASON FOR INSPECTION (QUARTERLY OR OTHER): 4th quarter inspection

GENERAL SITE CONDITIONS: U=UNACCEPTABLE A=ACCEPTABLE

(Note: For general site conditions note existence of bare areas (number,size), cracks, subsidence (sinking), ponded water, stressed vegetation, soil discoloration or seeps, and rodent burrows. For site security, note absence of locks, gates open or damaged, missing signs or evidence of vandalism. Note any other unusual occurences.)

		COMMENTS
ACCESS ROAD	A	
COVER VEGETATION	A	
TREES	A	
LITTER	A	minimum garbage was collected
EROSION (CAP)	A	
EROSION (BANK)	A	
SECURITY:		
FENCE/LOCKS	A	
PIEZOMETERS/LOCKS	A	new lock was put on P-5
MONITORING WELLS/LOCKS	A	
MANHOLES/LIDS/LOCKS	A	
ELECTRICAL PANEL	A	

ADDITIONAL COMMENTS: Sevenson arrived on site at 930 on 11/6/19. The site was secured

A small amount of garbage was collected and disposed. A new lock was put on P-5.

Tables

TABLE 1
CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK

ANALYTICAL SUMMARY
GROUND WATER SAMPLING 2013-2019

MONITOR WELL: MW-A3

	2013		2014		2015		2016		2017		2018		2019	
Parameter	May	September	April	September	May	September	May	September	May	September	May	September	May	September
Alpha-BHC	0.047U	NR	NR	0.047U	0.047U	NR	NR	-	0.047U	NR	NR	-	-	NR
Beta-BHC	0.047U	NR	NR	0.047U	0.047U	NR	NR	-	0.047U	NR	NR	-	-	NR
Gamma-BHC	0.047U	NR	NR	0.047U	0.047U	NR	NR	-	0.047U	NR	NR	-	-	NR
Delta-BHC	0.047U	NR	NR	0.047U	0.047U	NR	NR	-	0.047U	NR	NR	-	-	NR
Hexachlorobenzene	NR	NR	NR	9.4U	NR	NR	NR	-	NR	NR	NR	-	-	NR

MONITOR WELL: MW-4

	2013		2014		2015		2016		2017		2018		2019	
Parameter	May	September	April	September	May	September	May	September	May	September	May	September	May	September
Alpha-BHC	0.047U	NR	NR	0.047U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U	0.13	NR
Beta-BHC	0.047U	NR	NR	0.047U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U	0.047U	NR
Gamma-BHC	0.047U	NR	NR	0.047U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U	0.48	NR
Delta-BHC	0.047U	NR	NR	0.047U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U	0.18	NR
Hexachlorobenzene	NR	NR	NR	9.4U	NR	NR	NR	10U	NR	NR	NR	9.4U	NR	NR

MONITOR WELL: MW-5

	2013		2014		2015		2016		2017		2018		2019	
Parameter	May	September	April	September	May	September	May	September	May	September	May	September	May	September
Alpha-BHC	0.047U	NR	NR	0.050U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U	0.1	NR
Beta-BHC	0.047U	NR	NR	0.050U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U	0.047U	NR
Gamma-BHC	0.047U	NR	NR	0.050U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U	0.41	NR
Delta-BHC	0.047U	NR	NR	0.050U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U	0.25	NR
Hexachlorobenzene	NR	NR	NR	9.4U	NR	NR	NR	10U	NR	NR	NR	9.4U	NR	NR

Notes: Concentration in ug/l
- \- insufficient sample
- U Undetected
- J Estimated value
- NR Not required

Table 2
Annual Manhole B Sampling

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK

ANALYTICAL RESULTS SUMMARY
ANNUAL LEACHATE SAMPLING

May 21, 2019

PARAMETER	MANHOLE B (MHB)
alpha-BHC	0.047U
beta-BHC	0.047U
delta-BHC	0.047U
gamma-BHC	0.047U
Hexachlorobenzene	NR

Notes:
U Undetected
J Estimated value
NR Not Required
Concentration in ug/l
Field blank was non-detect for all parameters of interest.
Data has been validated and judged acceptable as qualified.
Next hexachlorobenzene (HCB) sampling scheduled for fall 2020

TABLE 3
Charles Gibson Site
Niagara Falls, New York

ANALYTICAL SUMMARY

Annual Cayuga Creek Sediment Sampling 2009 - 2019

UPSTREAM

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Parameter	September	September	September	September	September	September	September	September	September	September	September
Alpha- BHC	240	94	200J	17	170J	120	NS	9.7	200	57U	3200
Beta- BHC	260	97	120J	48	190J	280	NS	25	190	57U	1100
Gamma- BHC	18J	33J	190U	5.5U	28U	49U	NS	5.6U	51U	57U	510U
Delta- BHC	39J	52J	140J	23	28U	49U	NS	19	51U	57U	510U

DOWNSTREAM

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Parameter	September	September	September	September	September	September	September	September	September	September	September
Alpha- BHC	210	53J	230J	9.8	29U	55	52U	7	69U	63U	NS
Beta- BHC	73	62J	130J	37	89	100	76	18	87	63U	NS
Gamma- BHC	60U	63U	220U	5.9U	29U	52U	52U	4.9U	69U	63U	NS
Delta- BHC	32	56J	170J	18	29U	52U	52U	15	69U	63U	NS

Notes:
Concentration in microgram per kilogram (ug/kg)
U Not Detected
J Estimated value
NS No sample in trap

Table 4

2019 Quarterly Groundwater Elevations Summary

Piezometer Pair	3/7/2019	Inward gradient	5/21/2019	Inward gradient	9/24/2019	Inward gradient	11/6/2019	Inward gradient
P1 outside **P2 inside**	565.52 565.58	Outward	566.11 565.58	Inward	564.91 565.35	Outward	564.74 565.40	Outward
P3 outside **P4 inside**	567.96 567.75	Inward	568.87 565.46	Inward	564.71 565.22	Outward	567.51 565.19	Inward
P5 outside **P6 inside**	569.08 567.67	Inward	569.43 567.88	Inward	567.90 567.17	Inward	568.85 567.36	Inward
		Below 565 ft msl		Below 565 ft msl		Below 565 ft msl		Below 565 ft msl
Manhole A	563.90	Yes	563.63	Yes	562.94	Yes	563.08	Yes
Manhole B	563.99	Yes	563.69	Yes	563.03	Yes	563.14	Yes

Notes: Measurement units are in feet above MSL.
Piezometers P1, P3, P5 are outside the slurry wall.
Piezometers P2, P4, P6 are located within the containment area.
NA – Not Available

Manhole monitoring:

- Maintain water level below 565 feet to prevent hydrostatic pressure buildup under concrete slab.
- Pump Manhole B as required to maintain an inward gradient.

Table 5
Olin Corp. Gibson Site
Discharge Volumes

Summary of Yearly Discharge Volumes

Date	Volume (gallons)
2009	40,187
2010	28,118
2011	40,625
2012	29,623
2013	46,766
2014	33,564
2015	18,537
2016	28,172
2017	35,492
2018	33,837
2019	**47,182**
TOTALS	**382,103**

Monthly Discharge Volumes 2019

Month	Volume (gallons)
Jan	2,003
Feb	4,874
Mar	3,821
Apr	6,502
May	13,192
Jun	3,924
Jul	1,971
Aug	2,236
Sep	8,659
Oct	0
Nov	0
Dec	0
Total	**47,182**

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
GROUNDWATER ELEVATION FORM

THIS FORM TO BE USED FOR ALL QUARTERLY PIEZOMETER AND MANHOLE GROUND-WATER ELEVATION MEASURING EVENTS

DATE: 3/11/19 TIME: 830

INSPECTOR: CHRIS JONES COMPANY: SEVENSON

WEATHER: 55° PARTLY CLOUDY

PIEZOMETER	RISER ELEVATION (INSIDE CASING)	DEPTH TO WATER (FT.)	WATER ELEVATION	COMMENTS
P-1	572.72	7.20	565.52	
P-2	574.89	9.31	565.58	
P-3	574.16	6.20	567.96	
P-4	576.14	8.39	567.75	
P-5	575.05	5.97	569.08	
P-6	578.28	10.61	567.67	
MANHOLE A	575.22	11.32	563.90	
MANHOLE B	577.34	13.35	563.99	

(Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater elevations in Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Depth to water distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A.
(Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)

ADDITIONAL COMMENTS/OBSERVATIONS:

OLIN CORPORATION

OLIN CORPORATION

Environmental Remediation Group
3855 N. Ocoee St., Ste. 200
Cleveland, Tennessee 37312
423/336-4000

SCALE:	DRAWN BY: JRH	DATE: 2-10-2020
0.5 IN = 40 FT.	CHKD. BY: ABC	DATE: 2-14-2020

CHARLES GIBSON SITE
NIAGRA FALLS, NY

GROUNDWATER CONTOUR MAP
PIEZOMETER/MANHOLE LEVELS
SAMPLING EVENT
MARCH 7, 2019

FIG. NO. 1

- MANHOLE
- PIEZOMETER

MANHOLES ARE TO MAINTAIN A WATER LEVEL BELOW 565 FT (AMSL)

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
GROUNDWATER ELEVATION FORM

THIS FORM TO BE USED FOR ALL QUARTERLY PIEZOMETER AND MANHOLE GROUND-WATER ELEVATION MEASURING EVENTS

DATE: 5/21/19 TIME: 0300

INSPECTOR: C Jones COMPANY: Stevenson

WEATHER: 55° Sunny

PIEZOMETER	RISER ELEVATION (INSIDE CASING)	DEPTH TO WATER (FT.)	WATER ELEVATION	COMMENTS
P-1	572.72	6.61	566.11	
P-2	574.89	9.31	565.58	
P-3	574.16	5.29	568.87	
P-4	576.14	10.68	565.46	
P-5	575.05	5.62	569.43	
P-6	578.28	10.40	567.88	
MANHOLE A	575.22	11.59	563.63	
MANHOLE B	577.34	13.65	563.69	

(Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater elevations in Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Depth to water distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A.
(Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)

ADDITIONAL COMMENTS/OBSERVATIONS:

Site was secure upon arrival. Performed annual groundwater sampling event and 2nd Quarter inspection.

Olin

OLIN CORPORATION

OLIN CORPORATION

Environmental Remediation Group
3855 N. Ocoee St., Ste. 200
Cleveland, Tennessee 37312
423/336-4000

SCALE:	DRAWN BY: JRH	DATE: 2-10-2020
0.5 IN = 40 FT.	CHKD. BY: ABC	DATE: 2-14-2020

CHARLES GIBSON SITE
NIAGRA FALLS, NY

GROUNDWATER CONTOUR MAP
PIEZOMETER/MANHOLE LEVELS
SAMPLING EVENT
MAY 21, 2019

FIG. NO.
2

- MANHOLE
- PIEZOMETER

MANHOLES ARE TO MAINTAIN A WATER LEVEL BELOW 565 FT (AMSL)

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
GROUNDWATER ELEVATION FORM

THIS FORM TO BE USED FOR ALL QUARTERLY PIEZOMETER AND MANHOLE GROUND-WATER ELEVATION MEASURING EVENTS

DATE: 9/24/2019 TIME: 830

INSPECTOR: Chris Jones COMPANY: Sevenson

WEATHER: 65F sunny

PIEZOMETER	RISER ELEVATION (INSIDE CASING)	DEPTH TO WATER (FT.)	WATER ELEVATION	COMMENTS
P-1	572.72	7.81	564.91	
P-2	574.89	9.54	565.35	
P-3	574.16	9.45	564.71	
P-4	576.14	10.92	565.22	
P-5	575.05	7.15	567.9	
P-6	578.28	11.11	567.17	
MANHOLE A	575.22	12.28	562.94	
MANHOLE B	577.34	14.31	563.03	

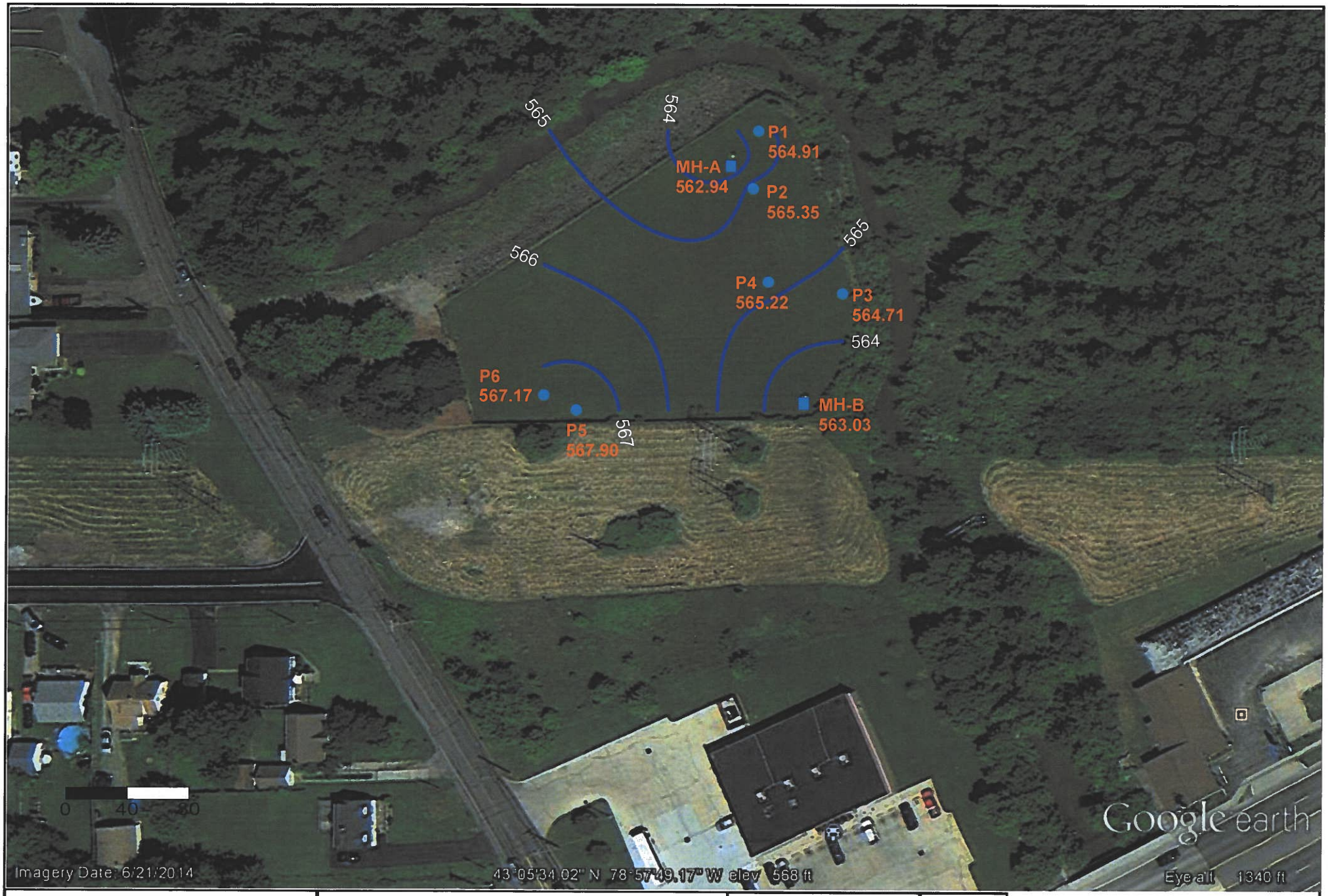
(Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater elevations in Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Depth to water distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A.
(Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)

ADDITIONAL COMMENTS/OBSERVATIONS:

New locks were put on P4 and P2. P3 needs a new well cap, the protective casing has sunk and needs to be built up.

See picture

The damaged wellhead was covered with plastic and secured with duct tape until repairs are made.



OLIN CORPORATION

OLIN CORPORATION

Environmental Remediation Group
3855 N. Ocoee St., Ste. 200
Cleveland, Tennessee 37312
423/336-4000

SCALE:	DRAWN BY: JRH	DATE: 2-10-2020
0.5 IN = 40 FT.	CHKD. BY: ABC	DATE: 2-14-2020

CHARLES GIBSON SITE
NIAGRA FALLS, NY

GROUNDWATER CONTOUR MAP
PIEZOMETER/MANHOLE LEVELS
SAMPLING EVENT
SEPTEMBER 24, 2019

FIG. NO. 3

- MANHOLE
- PIEZOMETER

MANHOLES ARE TO MAINTAIN A WATER LEVEL BELOW 565 FT (AMSL)

CHARLES GIBSON SITE
NIAGARA FALLS, NEW YORK
NYSDEC REGISTRY NO. 9-32-063
GROUNDWATER ELEVATION FORM

THIS FORM TO BE USED FOR ALL QUARTERLY PIEZOMETER AND MANHOLE GROUND-WATER ELEVATION MEASURING EVENTS

DATE: 11/6/2019 TIME: 930

INSPECTOR: C Jones COMPANY: Sevenson

WEATHER: 34 sunny

PIEZOMETER	RISER ELEVATION (INSIDE CASING)	DEPTH TO WATER (FT.)	WATER ELEVATION	COMMENTS
P-1	572.72	7.98	564.74	
P-2	574.89	9.49	565.4	
P-3	574.16	6.65	567.51	
P-4	576.14	10.95	565.19	
P-5	575.05	6.2	568.85	
P-6	578.28	10.92	567.36	
MANHOLE A	575.22	12.14	563.08	
MANHOLE B	577.34	14.2	563.14	

(Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater elevations in Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Depth to water distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A.
(Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)

ADDITIONAL COMMENTS/OBSERVATIONS:

Water levels in Creek were low. Vegetation along SE side of fence was cut down.

OLIN CORPORATION

OLIN CORPORATION

Environmental Remediation Group
3855 N. Ocoee St., Ste. 200
Cleveland, Tennessee 37312
423/336-4000

SCALE:	DRAWN BY: JRH	DATE: 2-10-2020
0.5 IN = 40 FT.	CHKD. BY: ABC	DATE: 2-14-2020

CHARLES GIBSON SITE
NIAGRA FALLS, NY

GROUNDWATER CONTOUR MAP
PIEZOMETER/MANHOLE LEVELS
SAMPLING EVENT
NOVEMBER 6, 2019

FIG. NO. 4

- MANHOLE
- PIEZOMETER

MANHOLES ARE TO MAINTAIN A WATER LEVEL BELOW 565 FT (AMSL)

June 05, 2019

Service Request No:R1904571

Mr. Dave Share
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312

Laboratory Results for: Olin - Charles Gibson

Dear Mr.Share,

Enclosed are the results of the sample(s) submitted to our laboratory May 22, 2019
For your reference, these analyses have been assigned our service request number **R1904571.**

All testing was performed according to our laboratory's quality assurance program and met the requirements of the TNI standards except as noted in the case narrative report. Any testing not included in the lab's accreditation is identified on a Non-Certified Analytes report. All results are intended to be considered in their entirety. ALS Environmental is not responsible for use of less than the complete report. Results apply only to the individual samples submitted to the lab for analysis, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s), and represented by Laboratory Control Sample control limits. Any events, such as QC failures or Holding Time exceedances, which may add to the uncertainty are explained in the report narrative or are flagged with qualifiers. The flags are explained in the Report Qualifiers and Definitions page of this report.

Please contact me if you have any questions. My extension is 7472. You may also contact me via email at Janice.Jaeger@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Janice Jaeger
Project Manager

CC: Adam Carringer

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ALS Group USA, Corp.
dba ALS Environmental

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ALS Environmental

Narrative Documents

ALS Environmental—Rochester Laboratory
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Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

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ALS Environmental

Client: Olin Corporation
Project: Olin - Charles Gibson
Sample Matrix: Water

Service Request: R1904571
Date Received: 05/22/2019

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

Five water samples were received for analysis at ALS Environmental on 05/22/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivoa GC:

Method 8081B, 05/30/2019: The upper control limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV). The field samples analyzed in this sequence did not contain the analyte(s) in question above the Method Reporting Limit (MRL). Since the exceedance equates to a potential high bias, the data quality was not significantly affected and no further corrective action was taken.

Approved by _____ Date 06/05/2019

ALS Environmental

SAMPLE DETECTION SUMMARY

CLIENT ID: MW-4-052119			Lab ID: R1904571-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
alpha-BHC	0.13			0.047	ug/L	8081B
delta-BHC	0.18			0.047	ug/L	8081B
gamma-BHC (Lindane)	0.48			0.047	ug/L	8081B

CLIENT ID: MW-5-052119			Lab ID: R1904571-004			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
alpha-BHC	0.10			0.047	ug/L	8081B
delta-BHC	0.25			0.047	ug/L	8081B
gamma-BHC (Lindane)	0.41			0.047	ug/L	8081B

CLIENT ID: MW-7-052119			Lab ID: R1904571-005			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
alpha-BHC	0.15			0.047	ug/L	8081B
delta-BHC	0.34			0.047	ug/L	8081B
gamma-BHC (Lindane)	0.58			0.047	ug/L	8081B

ALS Environmental

Sample Receipt Information

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: Olin Corporation **Service Request:**R1904571
Project: Olin - Charles Gibson/1209

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
R1904571-001	MH-B-052119	5/21/2019	0930
R1904571-002	MW-4-052119	5/21/2019	1210
R1904571-003	Field Blank-052119	5/21/2019	1230
R1904571-004	MW-5-052119	5/21/2019	1045
R1904571-005	MW-7-052119	5/21/2019	1111

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM 57037

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE 1 OF 1

Project Name: OLIN - CHARLES GIBSON	Project Number: 1209
Project Manager: ADAM CARRINGER	Report CC: ADAM CARRINGER - OLIN
Company/Address: OLIN CORP 3855 NORTH OCOEE ST SUITE 200 CLEVELAND TN 37312	
Phone #: (423) 336-4987	Email: ABcarringer@Olin.Com
Sampler's Signature:	Sampler's Printed Name: CHRIS JONES

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

PRESERVATIVE

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GCMS VOAs • 8260 • 624 • CLP	GCMS SVOAs • 8270 • 625	GC VOAs • 8021 • 601/602	PESTICIDES • 8081 • 608	PCBs • 8082 • 608	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	REMARKS/ ALTERNATE DESCRIPTION
MW-6-052119		5/21/19	930	GW	2				2				
MW-4-052119			1210		4				4				MS/MSD VOLUME
FIELD BLANK-052119			1230		1				1				
MW-5-052119			1245		2				2				
MW-7-052119			1111		2				2				

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

SPECIAL INSTRUCTIONS/COMMENTS
Metals
SHIPPED IN 1 COOLER

See QAPP ☐

STATE WHERE SAMPLES WERE COLLECTED NY

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
____ 1 day ____ 2 day ____ 3 day
____ 4 day ____ 5 day
____ Standard (10 business days-No Surcharge)

REQUESTED REPORT DATE
STANDARD

REPORT REQUIREMENTS
____ I. Results Only
X II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data

Edata ____ Yes ____ No

INVOICE INFORMATION
PO # RE1W 0005
BILL TO: OLIN

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature:	UPS				
Printed Name: CHRIS JONES					
Firm: SEVENSON					
Date/Time: 5/21/19 1500			Date/Time: 5/22/19 0945		

R1904571 5
Olin Corporation
Olin - Charles Gibson

Distribution: White - Lab Copy; Yellow - Return to Originator

R1904571 5
Olin Corporation
Olin - Charles Gibson

Cooler Receipt and Preservation Check Form

Project/Client Olin Folder Number .

Cooler received on 5/22/19 by: @

COURIER: ALS (UPS) FEDEX VELOCITY CLIENT

1	Were **Custody seals** on outside of cooler?	(Y) N
2	**Custody papers** properly completed (ink, signed)?	(Y) N
3	Did all bottles arrive in good **condition** (unbroken)?	(Y) N
4	Circle: (Wet Ice) **Dry Ice Gel packs** present?	(Y) N

5a	**Perchlorate** samples have required headspace?	Y N (NA)
5b	Did VOA vials, Alk,or Sulfide have sig* **bubbles**?	Y N (NA)
6	Where did the bottles originate?	(ALS/ROC) CLIENT
7	Soil VOA received as:	Bulk Encore 5035set (NA)

8. Temperature Readings Date: 5/22/19 Time: 1005 ID: IR#7 (IR#10) From: (Temp Blank) Sample Bottle

Observed Temp (°C)	3.9						
Correction Factor (°C)	+0.3						
Corrected Temp (°C)	4.2						
Temp from:Type of bottle	BL amber						
Within 0-6°C?	(Y) N	Y N	Y N	Y N	Y N	Y N	Y N
If <0°C, were samples frozen?	Y N	Y N	Y N	Y N	Y N	Y N	Y N

If out of Temperature, note packing/ice condition: _____ Ice melted Poorly Packed (described below) Same Day Rule

&Client Approval to Run Samples: _____ Standing Approval Client aware at drop-off Client notified by: _____

All samples held in storage location: R-002 by @ on 5/22/19 at 1010
5035 samples placed in storage location: _____ by _____ on _____ at _____

Cooler Breakdown/Preservation Check**: Date: 5/22/19 Time: 1329 by: @

9. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? (YES) NO
10. Did all bottle labels and tags agree with custody papers? (YES) NO
11. Were correct containers used for the tests indicated? (YES) NO
12. Were 5035 vials acceptable (no extra labels, not leaking)? YES NO (N/A)
13. Air Samples: Cassettes / Tubes Intact with MS? Canisters Pressurized Tedlar® Bags Inflated (N/A)

pH	Lot of test paper	Reagent	Preserved? Yes	Preserved? No	Lot Received	Exp	Sample ID Adjusted	Vol. Added	Lot Added	Final pH
≥12		NaOH								
≤2		HNO_3								
≤2		H_2SO_4								
<4		$NaHSO_4$								
5-9		For 608pest			No=Notify for 3day					
Residual Chlorine (-)		For CN, Phenol, 625, 608pest, 522			If +, contact PM to add $Na_2S_2O_3$ (625, 608. CN), ascorbic (phenol).					
		$Na_2S_2O_3$								
		ZnAcetate	-	-			**VOAs and 1664 Not to be tested before analysis. Otherwise, all bottles of all samples with chemical preservatives are checked (not just representatives).			
		HCl	**	**						

Bottle lot numbers: 0408/9-1DK

Explain all Discrepancies/ Other Comments:

CLRES	BULK
DO	FLDT
HPROD	HGFB
HTR	LL3541
PH	SUB
SO3	MARRS
ALS	REV

Labels secondary reviewed by: _____
PC Secondary Review: _____ 5/23/19 *significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: Olin Corporation **Service Request:** R1904571
Project: Olin - Charles Gibson/1209

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
R1904571-001.01					
		5/22/2019	1333	SMO / BALLGEIER	
		5/22/2019	1333	R-002 / BALLGEIER	
R1904571-001.02					
	8081B				
		5/22/2019	1333	SMO / BALLGEIER	
		5/22/2019	1333	R-002 / BALLGEIER	
		5/24/2019	0826	In Lab / VSTAUFFER	
R1904571-002.01					
	8081B				
		5/22/2019	1333	SMO / BALLGEIER	
		5/22/2019	1333	R-002 / BALLGEIER	
		5/24/2019	0826	In Lab / VSTAUFFER	
R1904571-002.02					
		5/22/2019	1333	SMO / BALLGEIER	
		5/22/2019	1333	R-002 / BALLGEIER	
		5/24/2019	0826	In Lab / VSTAUFFER	
R1904571-002.03					
		5/22/2019	1333	SMO / BALLGEIER	
		5/22/2019	1333	R-002 / BALLGEIER	
R1904571-002.04					
		5/22/2019	1333	SMO / BALLGEIER	
		5/22/2019	1333	R-002 / BALLGEIER	
		5/24/2019	0826	In Lab / VSTAUFFER	
R1904571-003.01					
	8081B				
		5/22/2019	1333	SMO / BALLGEIER	
		5/22/2019	1333	R-002 / BALLGEIER	
		5/24/2019	0826	In Lab / VSTAUFFER	
R1904571-004.01					
	8081B				
		5/22/2019	1333	SMO / BALLGEIER	
		5/22/2019	1333	R-002 / BALLGEIER	
		5/24/2019	0826	In Lab / VSTAUFFER	
R1904571-004.02					
		5/22/2019	1333	SMO / BALLGEIER	

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: Olin Corporation **Service Request:** R1904571
Project: Olin - Charles Gibson/1209

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
		5/22/2019	1333	R-002 / BALLGEIER	
R1904571-005.01					
	8081B				
		5/22/2019	1333	SMO / BALLGEIER	
		5/22/2019	1333	R-002 / BALLGEIER	
		5/24/2019	0826	In Lab / VSTAUFFER	
R1904571-005.02					
		5/22/2019	1333	SMO / BALLGEIER	
		5/22/2019	1333	R-002 / BALLGEIER	

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Miscellaneous Forms

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ALS Environmental

REPORT QUALIFIERS AND DEFINITIONS

U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.

J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).

B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.

E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.

E Organics- Concentration has exceeded the calibration range for that specific analysis.

D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.

* Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.

H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.

Spike was diluted out.

+ Correlation coefficient for MSA is <0.995.

N Inorganics- Matrix spike recovery was outside laboratory limits.

N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.

S Concentration has been determined using Method of Standard Additions (MSA).

W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.

P Concentration >40% difference between the two GC columns.

C Confirmed by GC/MS

Q DoD reports: indicates a pesticide/Aroclor is not confirmed (≥100% Difference between two GC columns).

X See Case Narrative for discussion.

MRL Method Reporting Limit. Also known as:
LOQ Limit of Quantitation (LOQ)
The lowest concentration at which the method analyte may be reliably quantified under the method conditions.

MDL Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).

LOD Limit of Detection. A value at or above the MDL which has been verified to be detectable.

ND Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.

ACCREDITED IN ACCORDANCE WITH nelac

Rochester Lab ID # for State Certifications[1]

Connecticut ID # PH0556	Maine ID #NY0032	Pennsylvania ID# 68-786
Delaware Approved	New Hampshire ID # 2941	Rhode Island ID # 158
DoD ELAP #65817	New York ID # 10145	Virginia #460167
Florida ID # E87674	North Carolina #676	

[1] Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the case narrative. Since not all analyte/method/matrix combinations are offered for state/NELAC accreditation, this report may contain results which are not accredited. For a specific list of accredited analytes, contact the laboratory or go to https://www.alsglobal.com/locations/americas/north-america/usa/new-york/rochester-environmental

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Client: Olin Corporation
Project: Olin - Charles Gibson/1209
Service Request: R1904571

Sample Name: MH-B-052119
Lab Code: R1904571-001
Sample Matrix: Water
Date Collected: 05/21/19
Date Received: 05/22/19

Analysis Method	Extracted/Digested By	Analyzed By
8081B	AMOSES	AMOSES

Sample Name: MW-4-052119
Lab Code: R1904571-002
Sample Matrix: Water
Date Collected: 05/21/19
Date Received: 05/22/19

Analysis Method	Extracted/Digested By	Analyzed By
8081B	AMOSES	AMOSES

Sample Name: Field Blank-052119
Lab Code: R1904571-003
Sample Matrix: Water
Date Collected: 05/21/19
Date Received: 05/22/19

Analysis Method	Extracted/Digested By	Analyzed By
8081B	AMOSES	AMOSES

Sample Name: MW-5-052119
Lab Code: R1904571-004
Sample Matrix: Water
Date Collected: 05/21/19
Date Received: 05/22/19

Analysis Method	Extracted/Digested By	Analyzed By
8081B	AMOSES	AMOSES

Sample Name: MW-7-052119
Lab Code: R1904571-005
Sample Matrix: Water
Date Collected: 05/21/19
Date Received: 05/22/19

Analysis Method	Extracted/Digested By	Analyzed By
8081B	AMOSES	AMOSES

INORGANIC PREPARATION METHODS

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9014 Cyanide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Acid Soluble	9030B
9056A Bomb (Halogens)	5050A
9066 Manual Distillation	9065
SM 4500-CN-E Residual Cyanide	SM 4500-CN-G
SM 4500-CN-E WAD Cyanide	SM 4500-CN-I

Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation Method
6010C	3050B
6020A	3050B
6010C TCLP (1311) extract	3005A/3010A
6010 SPLP (1312) extract	3005A/3010A
7196A	3060A
7199	3060A
9056A Halogens/Halides	5050
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction

For analytical methods not listed, the preparation method is the same as the analytical method reference.

ALS Environmental

Sample Results

ALS Environmental—Rochester Laboratory
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www.alsglobal.com

ALS Environmental

Semivolatile Organic Compounds by GC

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client:	Olin Corporation	**Service Request:**	R1904571
Project:	Olin - Charles Gibson/1209	**Date Collected:**	05/21/19 09:30
Sample Matrix:	Water	**Date Received:**	05/22/19 09:45
Sample Name:	MH-B-052119	**Units:**	ug/L
Lab Code:	R1904571-001	**Basis:**	NA

Organochlorine Pesticides by Gas Chromatography

Analysis Method: 8081B
Prep Method: EPA 3510C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
alpha-BHC	ND U	0.047	1	05/30/19 12:08	5/24/19	
beta-BHC	ND U	0.047	1	05/30/19 12:08	5/24/19	
delta-BHC	ND U	0.047	1	05/30/19 12:08	5/24/19	
gamma-BHC (Lindane)	ND U	0.047	1	05/30/19 12:08	5/24/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	52	10 - 164	05/30/19 12:08	
Tetrachloro-m-xylene	67	10 - 147	05/30/19 12:08	

Client:	Olin Corporation	**Service Request:**	R1904571
Project:	Olin - Charles Gibson/1209	**Date Collected:**	05/21/19 12:10
Sample Matrix:	Water	**Date Received:**	05/22/19 09:45
Sample Name:	MW-4-052119	**Units:**	ug/L
Lab Code:	R1904571-002	**Basis:**	NA

Organochlorine Pesticides by Gas Chromatography

Analysis Method: 8081B
Prep Method: EPA 3510C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
alpha-BHC	**0.13**	0.047	1	06/03/19 14:14	5/24/19	
beta-BHC	ND U	0.047	1	06/03/19 14:14	5/24/19	
delta-BHC	**0.18**	0.047	1	06/03/19 14:14	5/24/19	
gamma-BHC (Lindane)	**0.48**	0.047	1	06/03/19 14:14	5/24/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	17	10 - 164	06/03/19 14:14	
Tetrachloro-m-xylene	67	10 - 147	06/03/19 14:14	

Client:	Olin Corporation	**Service Request:**	R1904571
Project:	Olin - Charles Gibson/1209	**Date Collected:**	05/21/19 12:30
Sample Matrix:	Water	**Date Received:**	05/22/19 09:45
Sample Name:	Field Blank-052119	**Units:**	ug/L
Lab Code:	R1904571-003	**Basis:**	NA

Organochlorine Pesticides by Gas Chromatography

Analysis Method: 8081B
Prep Method: EPA 3510C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
alpha-BHC	ND U	0.047	1	05/29/19 21:07	5/24/19	
beta-BHC	ND U	0.047	1	05/29/19 21:07	5/24/19	
delta-BHC	ND U	0.047	1	05/29/19 21:07	5/24/19	
gamma-BHC (Lindane)	ND U	0.047	1	05/29/19 21:07	5/24/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	13	10 - 164	05/29/19 21:07	
Tetrachloro-m-xylene	67	10 - 147	05/29/19 21:07	

Client:	Olin Corporation	**Service Request:**	R1904571
Project:	Olin - Charles Gibson/1209	**Date Collected:**	05/21/19 10:45
Sample Matrix:	Water	**Date Received:**	05/22/19 09:45
Sample Name:	MW-5-052119	**Units:**	ug/L
Lab Code:	R1904571-004	**Basis:**	NA

Organochlorine Pesticides by Gas Chromatography

Analysis Method: 8081B
Prep Method: EPA 3510C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
alpha-BHC	**0.10**	0.047	1	05/29/19 21:24	5/24/19	
beta-BHC	ND U	0.047	1	05/29/19 21:24	5/24/19	
delta-BHC	**0.25**	0.047	1	05/29/19 21:24	5/24/19	
gamma-BHC (Lindane)	**0.41**	0.047	1	05/29/19 21:24	5/24/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	24	10 - 164	05/29/19 21:24	
Tetrachloro-m-xylene	46	10 - 147	05/29/19 21:24	

Client:	Olin Corporation	**Service Request:**	R1904571
Project:	Olin - Charles Gibson/1209	**Date Collected:**	05/21/19 11:11
Sample Matrix:	Water	**Date Received:**	05/22/19 09:45
Sample Name:	MW-7-052119	**Units:**	ug/L
Lab Code:	R1904571-005	**Basis:**	NA

Organochlorine Pesticides by Gas Chromatography

Analysis Method: 8081B
Prep Method: EPA 3510C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
alpha-BHC	**0.15**	0.047	1	05/29/19 21:42	5/24/19	
beta-BHC	ND U	0.047	1	05/29/19 21:42	5/24/19	
delta-BHC	**0.34**	0.047	1	05/29/19 21:42	5/24/19	
gamma-BHC (Lindane)	**0.58**	0.047	1	05/29/19 21:42	5/24/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	36	10 - 164	05/29/19 21:42	
Tetrachloro-m-xylene	66	10 - 147	05/29/19 21:42	

October 15, 2019

Service Request No:R1909482

Mr. Dave Share
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312

Laboratory Results for: Gibson Niagara Falls

Dear Mr.Share,

Enclosed are the results of the sample(s) submitted to our laboratory October 01, 2019
For your reference, these analyses have been assigned our service request number **R1909482.**

All testing was performed according to our laboratory's quality assurance program and met the requirements of the TNI standards except as noted in the case narrative report. Any testing not included in the lab's accreditation is identified on a Non-Certified Analytes report. All results are intended to be considered in their entirety. ALS Environmental is not responsible for use of less than the complete report. Results apply only to the individual samples submitted to the lab for analysis, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s), and represented by Laboratory Control Sample control limits. Any events, such as QC failures or Holding Time exceedances, which may add to the uncertainty are explained in the report narrative or are flagged with qualifiers. The flags are explained in the Report Qualifiers and Definitions page of this report.

Please contact me if you have any questions. My extension is 7472. You may also contact me via email at Janice.Jaeger@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Brady Kalkman For
Janice Jaeger
Project Manager

CC: Adam Carringer

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ALS Group USA, Corp.
dba ALS Environmental

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Table of Contents

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ALS Environmental

Narrative Documents

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ALS Environmental

Client: Olin Corporation
Project: Gibson Niagara Falls
Sample Matrix: Soil

Service Request: R1909482
Date Received: 10/01/2019

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

One soil sample was received for analysis at ALS Environmental on 10/01/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivoa GC:

Method 8081B, 10/07/2019: The lower control limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV) due to breakdown of DDT caused by high levels of hydrocarbons/organics in samples. Samples were run twice and reported on the second run in order to protect instrument integrity. No further corrective action was taken.
Method 8081B, 654497: The reporting limit is elevated for one or more analytes. The sample extract was diluted prior to instrumental analysis due to relatively high levels of non-target background components. The extract was highly colored and viscous, which indicated the need to perform a dilution prior to injection into the instrument. Clean-up of the extract was performed within the scope of the method, but did not eliminate enough of the background components to prevent dilution. The result(s) are flagged to indicate the matrix interference.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by _____ Date 10/15/2019

ALS Environmental

SAMPLE DETECTION SUMMARY

CLIENT ID: US-1-092619	Lab ID: R1909482-001					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Total Solids	34.7				Percent	ALS SOP
alpha-BHC	3200			510	ug/Kg	8081B
beta-BHC	1100			510	ug/Kg	8081B

ALS Environmental

Sample Receipt Information

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: Olin Corporation **Service Request:**R1909482

Project: Gibson Niagara Falls/1209

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
R1909482-001	US-1-092619	9/26/2019	1000

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM 58942

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE 1 OF 1

Project Name: CHARLES GIBSON	Project Number: 1209
Project Manager: ADAM CARRINGER	Report CC: ABCarringer@Olin.com
Company/Address: OLIN CORP	
3855 NORTH OCOEE ST SUITE 200	
CLEVELAND TN 37312	
Phone #: 423 336 4989	Email: ABCarringer@Olin.com
Sampler's Signature:	Sampler's Printed Name: CHRIS JONES

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

PRESERVATIVE

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOAs • 8260 • 624 • CLP	GC/MS SVOAs • 8270 • 625	GC VOAs • 8021 • 601/602	PESTICIDES • 8081 • 608	PCBs • 8082 • 608	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	REMARKS/ ALTERNATE DESCRIPTION
US-1-092619		9/26	1000	SED	1				1				
TEMP BLANK		—	—	—	1								PROVIDED BY LAB

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☐

STATE WHERE SAMPLES WERE COLLECTED

TURNAROUND REQUIREMENTS
_____ RUSH (SURCHARGES APPLY)
_____ 1 day _____ 2 day _____ 3 day
_____ 4 day _____ 5 day
_____ Standard (10 business days-No Surcharge)

REQUESTED REPORT DATE
STANDARD

REPORT REQUIREMENTS
_____ I. Results Only
☒ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
_____ III. Results + QC and Calibration Summaries
_____ IV. Data Validation Report with Raw Data

Edata _____ Yes _____ No

INVOICE INFORMATION
PO # RBW 0005
BILL TO: OLIN

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
	UPS				
Signature: JWW	Signature: Gary Bohan	Signature:	Signature:	Signature:	Signature:
Printed Name: John Wright	Printed Name: Gary Bohan	Printed Name:	Printed Name:	Printed Name:	Printed Name:
Firm: Severson	Firm: ALS	Firm:	Firm:	Firm:	Firm:
Date/Time: 9/30/19 10:30	Date/Time: 10/1/19 0940	Date/Time:	Date/Time:	Date/Time:	Date/Time:

R1909482 5
Olin Corporation
Gibson Niagara Falls

Distribution: White - Lab Copy; Yellow - Return to Originator

R1909482 5
Olin Corporation
Gibson Niagara Falls

Cooler Receipt and Preservation Check Form

Project/Client US-1 / OLIN Corp Folder Number

Cooler received on 10/1/19 by: GB

COURIER: ALS UPS (FEDEX) VELOCITY CLIENT

1	Were **Custody seals** on outside of cooler?	(Y)	N
2	**Custody papers** properly completed (ink, signed)?	(Y)	N
3	Did all bottles arrive in good **condition** (unbroken)?	(Y)	N
4	Circle: (Wet Ice) **Dry Ice Gel packs** present?	(Y)	N

5a	**Perchlorate** samples have required headspace?	Y	N	(NA)
5b	Did VOA vials, Alk,or Sulfide have sig* **bubbles**?	Y	N	(NA)
6	Where did the bottles originate?	(ALS/ROC)		CLIENT
7	Soil VOA received as: Bulk Encore 5035set			(NA)

8. Temperature Readings Date 10/1/19 Time: 0948 ID: IR#7 (IR#10) From: (Temp Blank) Sample Bottle

Observed Temp (°C)	1.3						
Correction Factor (°C)	0.0						
Corrected Temp (°C)	1.3						
Temp from:Type of bottle	Cent tube						
Within 0-6°C?	(Y) N	Y N	Y N	Y N	Y N	Y N	Y N
If <0°C, were samples frozen?	Y (N)	Y N	Y N	Y N	Y N	Y N	Y N

If out of Temperature, note packing/ice condition: _____ Ice melted Poorly Packed (described below) Same Day Rule

&Client Approval to Run Samples: _____ Standing Approval Client aware at drop-off Client notified by: _____

All samples held in storage location: R002 by GB on 10/1 at 0950
5035 samples placed in storage location: _____ by _____ on _____ at _____

Cooler Breakdown/Preservation Check**: Date: 10/1/19 Time: 1315 by: DW

9. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? (YES) NO
10. Did all bottle labels and tags agree with custody papers? (YES) NO
11. Were correct containers used for the tests indicated? (YES) NO
12. Were 5035 vials acceptable (no extra labels, not leaking)? YES NO (N/A)
13. Air Samples: Cassettes / Tubes Intact with MS? Canisters Pressurized Tedlar® Bags Inflated (N/A)

pH	Lot of test paper	Reagent	Preserved? Yes	Preserved? No	Lot Received	Exp	Sample ID Adjusted	Vol. Added	Lot Added	Final pH
≥12		NaOH								
≤2		HNO_3								
≤2		H_2SO_4								
<4		$NaHSO_4$								
5-9		For 608pest			No=Notify for 3day					
Residual Chlorine (-)		For CN, Phenol, 625, 608pest, 522			If +, contact PM to add $Na_2S_2O_3$ (625, 608, CN), ascorbic (phenol).					
		$Na_2S_2O_3$								
		ZnAcetate	-	-						
		HCl	**	**						

**VOAs and 1664 Not to be tested before analysis. Otherwise, all bottles of all samples with chemical preservatives are checked (not just representatives).

Bottle lot numbers: 677219-138

Explain all Discrepancies/ Other Comments:

CLRES	BULK
DO	FLDT
HPROD	HGFB
HTR	LL3541
PH	SUB
SO3	MARRS
ALS	REV

Labels secondary reviewed by: DH

PC Secondary Review: _____

*significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

P:\INTRANET\QAQC\Forms Controlled\Cooler Receipt r16.doc 3/12/18

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: Olin Corporation **Service Request:** R1909482
Project: Gibson Niagara Falls/1209

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
R1909482-001.01					
	8081B,ALS SOP				
		10/1/2019	1322	SMO / GLAFORCE	
		10/1/2019	1322	R-002 / GLAFORCE	
		10/2/2019	0810	In Lab / KSERCU	
		10/2/2019	1532	R-002 / KSERCU	

ALS Environmental

Miscellaneous Forms

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REPORT QUALIFIERS AND DEFINITIONS

U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.

J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).

B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.

E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.

E Organics- Concentration has exceeded the calibration range for that specific analysis.

D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.

* Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.

H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.

Spike was diluted out.

+ Correlation coefficient for MSA is <0.995.

N Inorganics- Matrix spike recovery was outside laboratory limits.

N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.

S Concentration has been determined using Method of Standard Additions (MSA).

W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.

P Concentration >40% difference between the two GC columns.

C Confirmed by GC/MS

Q DoD reports: indicates a pesticide/Aroclor is not confirmed (≥100% Difference between two GC columns).

X See Case Narrative for discussion.

MRL Method Reporting Limit. Also known as:
LOQ Limit of Quantitation (LOQ)
The lowest concentration at which the method analyte may be reliably quantified under the method conditions.

MDL Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).

LOD Limit of Detection. A value at or above the MDL which has been verified to be detectable.

ND Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.

ACCREDITED IN ACCORDANCE WITH nelac

Rochester Lab ID # for State Certifications[1]

Connecticut ID # PH0556	Maine ID #NY0032	Pennsylvania ID# 68-786
Delaware Approved	New Hampshire ID # 2941	Rhode Island ID # 158
DoD ELAP #65817	New York ID # 10145	Virginia #460167
Florida ID # E87674	North Carolina #676	

[1] Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the case narrative. Since not all analyte/method/matrix combinations are offered for state/NELAC accreditation, this report may contain results which are not accredited. For a specific list of accredited analytes, contact the laboratory or go to https://www.alsglobal.com/locations/americas/north-america/usa/new-york/rochester-environmental

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Client: Olin Corporation **Service Request:** R1909482
Project: Gibson Niagara Falls/1209

Non-Certified Analytes

Certifying Agency: New York Department of Health

Method	Matrix	Analyte
ALS SOP	Soil	Total Solids

Client:	Olin Corporation	**Service Request:**	R1909482
Project:	Gibson Niagara Falls/1209		

Sample Name:	US-1-092619	**Date Collected:**	09/26/19
Lab Code:	R1909482-001	**Date Received:**	10/1/19
Sample Matrix:	Soil		

Analysis Method	Extracted/Digested By	Analyzed By
8081B	AFELSER	AMOSES
ALS SOP		KAWONG

INORGANIC PREPARATION METHODS

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9014 Cyanide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Acid Soluble	9030B
9056A Bomb (Halogens)	5050A
9066 Manual Distillation	9065
SM 4500-CN-E Residual Cyanide	SM 4500-CN-G
SM 4500-CN-E WAD Cyanide	SM 4500-CN-I

Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation Method
6010C	3050B
6020A	3050B
6010C TCLP (1311) extract	3005A/3010A
6010 SPLP (1312) extract	3005A/3010A
7196A	3060A
7199	3060A
9056A Halogens/Halides	5050
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction

For analytical methods not listed, the preparation method is the same as the analytical method reference.

ALS Environmental

Sample Results

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ALS Environmental

Semivolatile Organic Compounds by GC

ALS Environmental—Rochester Laboratory
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Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Olin Corporation	**Service Request:**	R1909482
Project:	Gibson Niagara Falls/1209	**Date Collected:**	09/26/19 10:00
Sample Matrix:	Soil	**Date Received:**	10/01/19 09:40
Sample Name:	US-1-092619	**Units:**	ug/Kg
Lab Code:	R1909482-001	**Basis:**	Dry

Organochlorine Pesticides by Gas Chromatography

Analysis Method: 8081B
Prep Method: EPA 3541

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
alpha-BHC	**3200**	510	100	10/07/19 23:43	10/2/19	
beta-BHC	**1100**	510	100	10/07/19 23:43	10/2/19	
delta-BHC	ND U	510	100	10/07/19 23:43	10/2/19	
gamma-BHC (Lindane)	ND U	510	100	10/07/19 23:43	10/2/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	0 *	10 - 145	10/07/19 23:43	D
Tetrachloro-m-xylene	0 *	10 - 123	10/07/19 23:43	D

ALS Environmental

General Chemistry

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client:	Olin Corporation	**Service Request:**	R1909482
Project:	Gibson Niagara Falls/1209	**Date Collected:**	09/26/19 10:00
Sample Matrix:	Soil	**Date Received:**	10/01/19 09:40
Sample Name:	US-1-092619	**Basis:**	As Received
Lab Code:	R1909482-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Total Solids	ALS SOP	**34.7**	Percent	-	1	10/08/19 07:50	