01 April 2014

Mr. Rick McClure
Olin Corporation
Environmental Remediation Group
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312

North Parking Lot Soil Investigation Work Plan – Revision 01
Niagara Falls, NY
AMEC Project No. 6107-14-0002

Dear Mr. McClure:

Please find attached the Revised North Parking Lot Soil Investigation Work Plan. The work plan was revised in accordance with NYSDEC's March 25, 2014 letter. AMEC appreciates this opportunity to assist Olin Corporation. If you have any questions or comments about this project, please call us at (770) 421-3400.

Sincerely,

AMEC
Environment and Infrastructure

Anthony W. Englund
Senior Engineer

Peter H. Thompson
Principal

Cc:
Dave Share – Olin

Attachments
2014 04 01 North Parking Lot Soil Investigation Work Plan – Revision 01

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North Parking Lot
Soil Investigation Work Plan
Revision 01

Olin Niagara Falls Plant
Niagara Falls, New York

Prepared for:

OLIN CORPORATION

Prepared by:

AMEC Environment &Infrastructure, Inc.
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April 1, 2014
Project 6107-14-0002

TABLE OF CONTENTS

LIST OF FIGURES

Figure

LIST OF APPENDICES

Appendix

ABBREVIATIONS AND ACRONYMS

Acronym	Definition
CFR	Code of Federal Regulations
CMS	Corrective Measures Study
DD	Day
DI	De-ionized
GPS	Global Positioning System
GWTS	Groundwater Treatment System
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
Hg	mercury
mg/kg	milligram per kilogram
MM	Month
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NELAP	National Environmental Laboratory Accreditation Program
NYSDEC	New York State Department of Environmental Conservation
OSHA	Occupational Safety and Health
PPE	Personal Protective Equipment
QC	Quality Control
SCO	Soil Cleanup Objective
SS	Stainless Steel
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
YYYY	Year

1.0 INTRODUCTION

The Olin Parking Lot Site (Parcels I and II) is located north of Buffalo Avenue, across from Olin's Niagara Falls, Chlor-Alkali Plant (Figure 1.1). On December 5, 2013 the New York State Department of Environmental Conservation (NYSDEC) approved a proposal to submit a work plan for additional surface soil sampling to determine the presence and concentration of mercury (Hg) in surface soil. Available data for the Parking Lot Site was limited to only one surface soil sample and is not sufficient to effectively characterize the surface soils of the Parking Lot Site. The available data are shown on Figure 1.1.

The one soil boring that includes surface soils available for the Corrective Measures Study (CMS) is below the New York State Department of Environmental Conservation (NYSDEC) Industrial Soil Cleanup Objective (SCO) for Hg of 5.7 milligram per kilogram (mg/kg), but does not appear to be located on the Parking Lot Site. There were also four sub-surface samples collected by the United States Geological Survey (USGS) in 1982, only one of which (Sample 4) exceeded the Hg SCO. Consequently, additional soil characterization is necessary and is the objective of this work plan.

A surface soil investigation will be performed to characterize the Parking Lot Site. This work plan describes the objectives, sample collection and analysis, data evaluation, reporting, and schedule for this work. This work plan has been revised in accordance with NYSDEC's conditional approval letter dated March 25, 2014 (Appendix A) which indicated that composite samples will not be allowed for site characterization. Therefore, the work plan has been revised to specify analysis of the individual samples collected.

2.0 OBJECTIVES

The characterization objectives are to:

- Collect representative surface soil samples for the Parking Lot Site.
- Analyze the samples for Total Hg to characterize the Parking Lot Site surface soils.
- Select an appropriate remedy for the Parking Lot Site based on the surface soil sampling results.

3.0 SAMPLE COLLECTION AND ANALYSIS

This section describes the sample collection procedures, decontamination process, analytical method, and health and safety requirements.

3.1 SAMPLE COLLECTION

Fifty surface soil borings will be advanced at the Parking Lot Site. Approximate locations are shown on Figure 3.1. The latitude and longitude of the borings will be surveyed with a handheld global positioning system (GPS).

A portion of the Parking Lot Site appears to be covered with asphalt or other cover material. If the existing cover material will allow samples to be collected with hand tools, the samples will be collected from the approximate locations shown on Figure 3.1. If the cover material does not allow the samples to be collected with hand tools, the sample locations in the covered area will be moved to other un-covered areas.

The borings will be advanced using clean, stainless steel (SS) hand augers or other hand-operated tools. The borings will be advanced to 2-inches below the existing vegetation or cover material (gravel, etc.) as specified for surface soil investigations in NYSDEC Technical Guidance Document DER-10 (NYSDEC, 2010). Soil will be collected from the boring and placed in a clean, laboratory-supplied, 4-ounce glass jar.

3.2 FIELD QUALITY CONTROL SAMPLES

Field Quality Control (QC) samples will consist of five duplicate samples, two matrix spike/matrix spike duplicate (MS/MSD) pairs, and one equipment rinse blank. The duplicate samples and MS/MSD pairs will be collected from randomly selected borings. The equipment rinse blank will be prepared by rinsing the non-disposable, decontaminated, sampling equipment with de-ionized (DI) water. The rinse water will then be collected in a laboratory supplied container for total Hg analysis. An analysis of the DI water used for the rinse will be kept for documentation.

3.3 SAMPLE LABELS

The samples to be submitted to the laboratory will be identified and labeled as follows:

1. PLS-SS-X-MMDDYYY (X = 1 – 50 – corresponding to boring location)
2. PLS-SS-X-MS-MMDDYYYY (X from boring that sample was collected from) (2 MS/MSD sample pairs collected from random borings)
3. PLS-SS-X-MSD-MMDDYYYY (X from boring that sample was collected from) (2 MS/MSD sample pairs collected from random borings)
4. DUP0X-SS-MMDDYYYY (X = 1 – 5) (5 duplicates collected from random borings)
5. PLS-EQB1-MMDDYYYY

3.4 DECONTAMINATION

Sample collection tools, utensils, and bowls will be decontaminated between samples. Following removal of loose soil, decontamination will be as follows:

1. Liquinox and water wash
2. DI water rinse
3. Nitric Acid rinse
4. DI water rinse

Decontamination wash water will be discharged to Olin's Groundwater Treatment System (GWTS) via the building floor sump. If the wash water contains a significant amount of solids, the solids will be allowed to settle and the water will be decanted to the GWTS floor sump. The solids will be containerized separately for proper disposal. Field personnel will wear nitrile gloves when handling the samples or sample tools. New gloves will be used in each area. Nitrile gloves and other personal protective equipment (PPE) will be disposed of with Olin's general waste.

3.5 HEALTH AND SAFETY REQUIREMENTS

Safety requirements will be outlined in a separate Health and Safety Plan (HASP). The HASP will be provided to field personnel for review before the investigation, and personnel performing the on-site investigation work will be required to sign an acknowledgement that they are familiar with the HASP.

Personnel engaged in field activities with potential for exposure to contaminants are required to have completed 40 hours of initial Hazardous Waste Operations and Emergency Response (HAZWOPER) training and annual 8-hour refreshers. Site personnel will be required to wear the

PPE specified in the HASP while engaged in field activities or while onsite during field activities. Level D PPE (hard hat, safety shoes, safety glasses) will be required at a minimum for personnel collecting the soil samples. Level D PPE is anticipated to offer sufficient protection to personnel working onsite. However, the required PPE level may be changed if conditions warrant. The required PPE level and conditions under which PPE requirements may change will be described in the HASP.

3.6 SAMPLE ANALYSIS

The samples will be properly preserved and shipped to a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory for analysis. The samples will be analyzed for Total Hg by United States Environmental Protection Agency (USEPA) SW-846 Method 7471B. The typical reporting limit for this method is 0.033 mg/kg, which is well below the NYSDEC Industrial SCO of 5.7 mg/kg for Hg.

4.0 DATA EVALUATION AND REPORTING

A Level I completeness check will be performed on the data generated from the samples collected with this work. This verification will include checks that:

- All results are present for the parameters requested on the chain-of-custody for each sample submitted
- Requested methods were utilized
- Reporting limits were adhered to with the exception of dilutions
- Requested reporting units were provided
- The data package includes a definition of any qualifiers
- Exceptions to the data are documented

After the data checks have been performed, the sample results will be compared to the NYSDEC Industrial SCO for Hg. A report will then be prepared that will detail the sampling effort and results. The report will also provide a proposed remedy to limit direct contact, fugitive dust generation, and water erosion of surface soil in areas with Hg concentrations above SCOs.

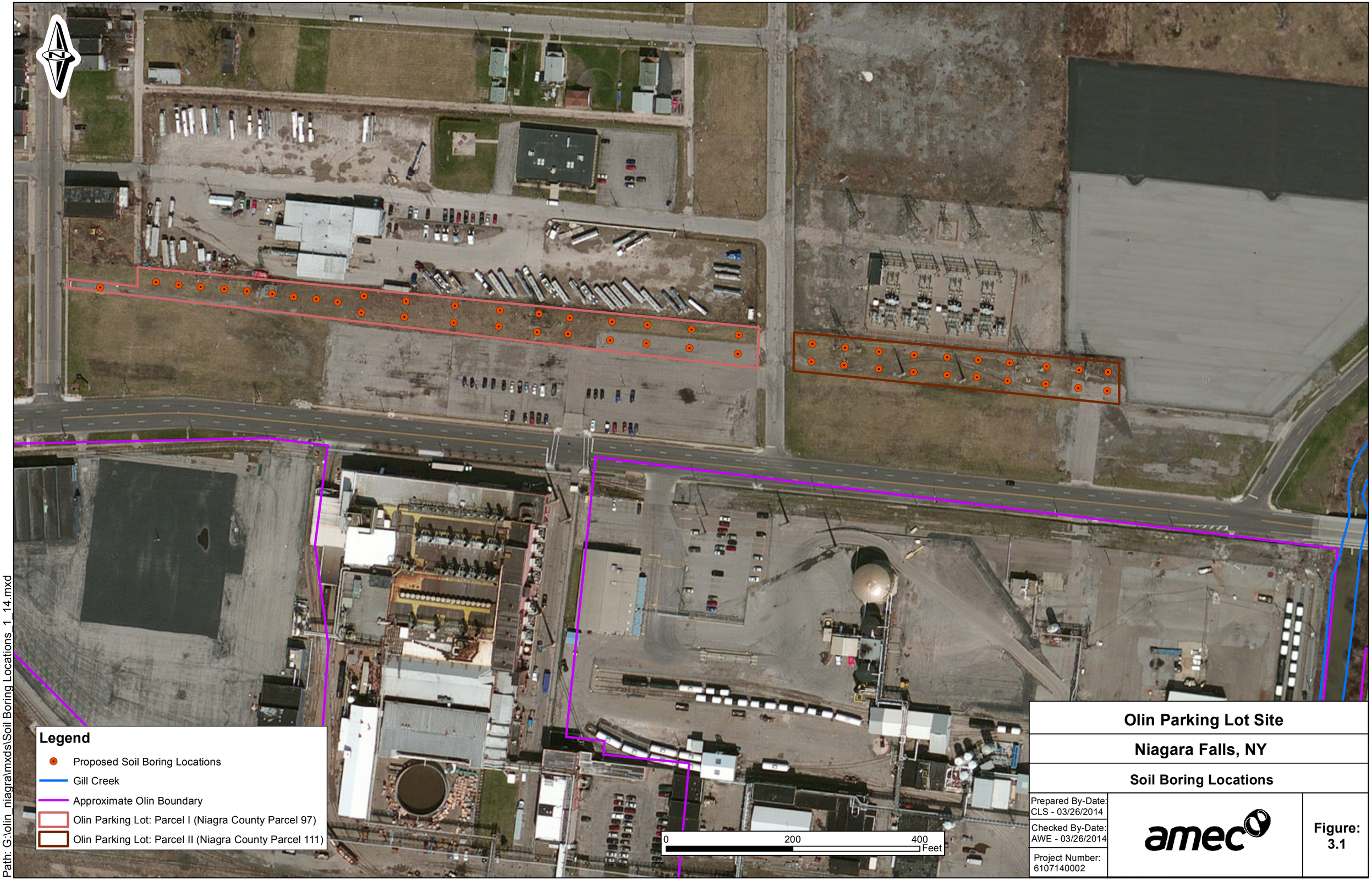
5.0 SCHEDULE

We recommend that the field work be performed in late spring when the weather and soil conditions are more favorable for surficial sampling. Assuming NYSDEC approval within 30 days of submittal of this work plan, we propose to plan, mobilize, and complete the field work by June 30, 2014. Analytical results are expected to be available within 30 days of the sampling event. A report of the field investigation results, evaluation of the sampling data, and remedy selection will be submitted to NYSDEC within 30 days of the final lab report data validation.

6.0 REFERENCES

NYSDEC. (2010). *DER 10 / Technical Guidance for Site Investigation and Remediation.* Albany, NY: NYSDEC.

FIGURES



Path: G:\olin_niagra\mxds\Soil Boring Locations_1_14.mxd

Olin Parking Lot Site

Niagara Falls, NY

Soil Boring Locations

Prepared By-Date: CLS - 03/26/2014	
Checked By-Date: AWE - 03/26/2014	amec
Project Number: 6107140002	**Figure: 3.1**

APPENDIX A

NYSDEC MARCH 25, 2014 LETTER

New York State Department of Environmental Conservation
Division of Environmental Remediation
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625 Broadway, Albany, New York 12233-7017
Phone: (518) 402-9814 • **Fax:** (518) 402-9819
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Joe Martens
Commissioner

March 25, 2014

Mr. Richard W. McClure
Environmental Remediation Group
Olin Corp
3855 N. Ocoee, Suite 200
Cleveland, Tennessee 37312

RE: North Parking Lot Soil Investigation Work Plan
Olin Chemicals, Buffalo Avenue Facility, Niagara Falls, New York
AOC Index No. R9-4171-94-08, NYSDEC Site No. 932051A

Dear Mr. McClure:

The New York State Departments of Health and Environmental Conservation have reviewed the above-referenced work plan dated January 20, 2014. The work plan describes Olin's proposed activities to characterize surface soil in the former Olin Parking Lot Parcels I and II located north of Buffalo Avenue across from Olin's Main Plant in Niagara Falls. The Agencies offer the following comment on the work plan.

Section 3.0 of the work plan proposes compositing samples from within distinct areas of each Parking Lot Parcel, and submitting each composite sample for analysis. As we discussed, compositing samples is not allowed for site characterization. Each soil sample must be analyzed individually.

Contingent on Olin's acceptance of this change in procedure, the referenced work plan is approved. If you have any questions regarding this letter, please call me at (518) 402-9813.

Sincerely,

Alex G. Czuhanich
Project Manager
Remedial Section B, Remedial Bureau E
Division of Environmental Remediation

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