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April 14, 2016

Mr. Geoffrey Seibel
de maximis, inc.
1550 Pond Road
Suite 120
Allentown, Pennsylvania 18104

148177.050.003

Subject: Post-Remedial Monitoring
Ecological Verification Sampling Report
Mercury Refining Superfund Site, Colonie, New York

Dear Mr. Seibel:

On behalf of the Mercury Refining Site Remedial Action Group ("the Group") and at your the direction as the Group's Project Coordinator, Brown and Caldwell Associates ("BC") submits to you the attached letter report summarizing the results of the 2015 ecological verification sampling event.

Please contact me with any questions or comments.

Very truly yours,

Brown and Caldwell Associates

Tamara L. Sorell

Tamara Sorell, Ph.D., BCES
Chief Scientist/National Risk Practice Lead

Attachments

Post-Remedial Monitoring
Ecological Verification Sampling Report
Mercury Refining Superfund Site
Colonie, New York

Prepared for
Mercury Refining Site Remedial Action Group

April 2016

Project Number: 148177.050.003

Brown and Caldwell Associates
122 South Swan Street
Albany, New York 12210

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Attachments

Executive Summary

Sediment Sampling

- Sediment sampling was completed at all locations in the O&M Plan;
- Total mercury concentrations ranged from 0.067 to 0.64 mg/kg, with the highest concentrations observed at sample location MR-SD-07 in the Tributary. No observations exceeded the ROD-specified sediment cleanup objective of 1.3 mg/kg.
- Total Organic Carbon (TOC) in the sediment samples was highly variable, ranging from 3,170 to 42,100 mg/kg. There does not appear to be a correlation between sediment mercury concentrations and TOC or grain size.
- Methyl mercury concentrations in sediment ranged from 0.082 (J qualified) µg/kg at location MR-SD-08 to 0.63 (J qualified) µg/kg at location MR-SD-09 DUP. There is currently no NYSDEC or USEPA criterion for methyl mercury in sediment.

Surface Water Sampling

- Surface water samples were collected from the unnamed Tributary, Patroon Creek and the I-90 Pond as required in the O&M Plan.
- Total mercury was not detected with Method 7471A at any of the three surface water sampling locations (at a minimum detection limit of 120 ng/L). The NYSDEC chronic water quality criterion for mercury for the protection of aquatic life is 770 ng/L (dissolved), and the NYSDEC criterion for the protection of human health based on fish consumption is 0.7 ng/L
- Using the more sensitive Method 1630, methyl mercury was detected at estimated concentrations of 0.04 ng/L at the Unnamed Tributary sampling location (MR-SW-07 DUP), 0.047 ng/L at the Patroon Creek sampling location (MR-SW-09) and 0.17 ng/L at the I-90 Pond sampling location (MR-SW-10). There is currently no NYSDEC criterion for methyl mercury. The Oak Ridge National Laboratory Tier II Secondary Chronic Value for freshwater aquatic life is 2.8 ng/L.

Fish Tissue Sampling

- Fish collection (location, type) and sample preparation (whole body) were completed in accordance with the requirements of the O&M Plan.
- Mercury concentrations in fish tissue samples were non-detect at detection limits ranging from 0.21 to 0.25 mg/kg. These detection limits are below the USEPA target fish tissue concentration of 0.3 mg/kg for methyl mercury. Percent lipids and percent moisture were comparable in the three samples.

Section 1

Introduction

This report presents the results of the first of five annual Post-Remedial Ecological Verification Sampling events required under Attachment C of the Operations and Maintenance (O&M) Plan [Appendix P of the USEPA-approved August 2013 Remedial Design Report (RDR)]. This monitoring event consisted of the collection of five sediment samples, three surface water samples, and three fish tissue samples. Site plan depicting the location of all ecological verification samples is provided as Attachment A. Samples were collected per the procedures described in the O&M Plan.

Section 2

Sediment Sampling

Sample Collection

Two sediment samples were taken in the unnamed tributary, at locations MR-SD-06 and MR-SD-07 on January, 26, 2016. Two sediment samples were also collected from Patroon Creek, at locations MR-SD-08 and MR-SD-09 on October 28, 2015. One sediment sample was taken from the I-90 pond as well, at location MR-SD-10 on October 28, 2015. All sample locations are depicted on the Site plan provided as Attachment A. Sampling was completed to a depth of approximately six inches below the sediment surface. Sediment samples were collected in a "downstream" to "upstream" direction (i.e., in a direction opposite the flow), to minimize the chance of spreading disturbed sediment to unsampled locations.

Sediment sampling was completed via the use of a decontaminated stainless steel sampling scoop. Sediment samples were collected with minimum disturbance and exposure to air. Samples were screened and logged in the field as described in Section 5.3 of the Quality Assurance Project Plan (QAPP, Appendix N of the RDR). Using a decontaminated scoop the sediment was transferred directly to the laboratory supplied sampling containers and stored and handled according to procedures outlined in Section 5.2 of the QAPP. Sampling equipment was decontaminated after the collection of each sample in accordance with the procedures outlined in Section 4.10 of the QAPP.

Sediment samples were analyzed for total mercury by USEPA Method SW-846 7471A, methyl mercury by USEPA Method 1630, Total Organic Carbon (TOC) by the Lloyd-Khan Method and particle size by ASTM D422 63.

Sediment samples analyzed for methyl mercury were sent to TestAmerica Canton, which holds a National Environmental Laboratory Accreditation Program (NELAP) certification and accreditation in the State of New York (Certification ID 10975).

All other analyses were sent to TestAmerica Buffalo, which holds NELAP certification and accreditation in the State of New York (Certification ID 10026).

Analytical Data Validation

The analytical data were validated in accordance with the QAPP. A Data Usability Summary Report (DUSR; Attachment B) was prepared for the ecological verification sample data packages. The analytical data for sediment samples were determined to be acceptable for the intended purposes and none of the data were rejected. Field duplicate precision for the sediment samples MR-SD-9 and DUP-20151028-SED exceeded the control limit for methyl mercury and most grain size parameters. These results have been qualified as estimated (J flagged). Field duplicate imprecision for the sediment samples MR-SD-07 and DUP-012616-SD exceeded the control limit for some grain size parameters. These results have been qualified as estimated (J flagged). A low recovery for mercury in the MS for sample MR-SD-06 resulted in the mercury result for sample MR-SD-06 being qualified as estimated (J flagged). The TOC result for sample MR-SD-06 has been qualified as estimated (J flagged) due to laboratory replicate imprecision. Estimated results should be used with caution.

Analytical results appear in Attachment C and are discussed below.

Analytical Results

Analytical results of the sediment sampling are presented in Table 1 provided in Attachment C. Sample locations are shown on the Site plan provided as Attachment A.

Total mercury concentrations ranged from 0.067 to 0.64 mg/kg, with the highest concentrations observed at sample location MR-SD-07 in the Tributary. No observations exceeded the ROD-specified remedial action objective sediment cleanup objective of 1.3 mg/kg. An estimated mercury concentration of 0.32 mg/kg was detected a sample location MR-SD-06, the most upstream sample location to the site in the remediated sediment area in the Unnamed Tributary to Patroon Creek. The two sampling locations in Patroon Creek MR-SD-08 (more upstream) and MR-SD-09 DUP (more downstream) had detections of mercury of 0.31 mg/kg and 0.43 mg/kg respectively. The I-90 pond sample (MR-SD-10) had a mercury concentration of 0.1 mg/kg.

Total Organic Carbon (TOC) in the sediment samples was highly variable, ranging from 3,170 to 42,100 mg/kg. As shown in Table 2, all of the sample locations consisted primarily of fine to coarse sand. MR-SD-10 had the highest TOC, consistent with its considerable silt component (32.5%), consistent with its location in relatively stagnant water. MR-SD-06, MR-SD-07 and MR-SD-09 locations had a considerable gravel component (17.6 to 31.7%). There does not appear to be a correlation between sediment mercury concentrations and TOC or grain size.

Methyl mercury concentrations in sediment ranged from 0.082 (J qualified) µg/kg at location MR-SD-08 to 0.63 (J qualified) µg/kg at location MR-SD-09 DUP. There is currently no NYSDEC or USEPA criterion for methyl mercury in sediment.

Section 3

Surface Water Sampling

Sample Collection

Surface water samples were collected from the unnamed Tributary, Patroon Creek and the I-90 Pond. One sample was collected from each water body, at sample locations MR-SW-07 (1/26/16), MR-SW-09(10/28/15), and MR SW-10 (10/28/15), as shown on the Site plan provided as Attachment A. The following procedure was used to collect surface water directly from the water bodies in sample containers provided by the project laboratory:

- Don a clean pair of latex gloves.
- Estimate sampling depth by visual observation (for shallow samples) or measure depth using a weighted, flexible measuring tape or a rigid gage.
- Invert the laboratory-supplied sample container (without preservatives), insert the sample container into the water to the desired level, and then turn the mouth of the sample container up and towards the upstream direction thus allowing the container to fill.
- Cap sample container while container is still underwater, if possible.
- Remove sample container from water body and cap if not already capped.
- Rinse the exterior of the sample container thoroughly with deionized water and label container.
- Add preservatives and check for appropriate pH.
- Record all appropriate data (including sampling location, sampling depth, time of sampling, and description of sample) in field logbook or the Surface Water Sampling Log.

Surface water samples were analyzed for mercury by USEPA Method SW 846 7471A, methyl mercury by USEPA Method 1630, alkalinity by USEPA Method 310.2, hardness by USEPA Method 130.2 and Total Dissolved Solids (TDS) by USEPA Methods 160.1 and SM 2540C.

Surface water samples analyzed for methyl mercury were sent to TestAmerica Canton, which holds a National Environmental Laboratory Accreditation Program (NELAP) certification and accreditation in the State of New York (Certification ID 10975).

All other analyses were sent to TestAmerica Buffalo which holds NELAP certification and accreditation in the State of New York (Certification ID 10026).

Analytical Data Validation

The analytical data were validated in accordance with the QAPP. A Data Usability Summary Report (DUSR; Attachment B) was prepared for the ecological verification sample data packages. The analytical data for surface water samples were determined to be acceptable for the intended purposes and none of the data was rejected or qualified.

Analytical Results

Analytical results of the sediment sampling are presented in Table 1 and field parameters of surface water at all sample locations are presented in Table 3 provided in Attachment C. Sample locations are shown on the Site plan provided as Attachment A.

Total mercury was not detected with Method 7471A at any of the three surface water sampling locations (at a minimum detection limit of 120 ng/L). However, using the more sensitive Method 1630, methyl mercury was detected at estimated concentrations of 0.04 ng/L at the Unnamed Tributary sampling location (MR-SW-07 DUP), 0.047 ng/L at the Patroon Creek sampling location (MR-SW-09) and 0.17 ng/L at the I-90 Pond sampling location (MR-SW-10). MR-SW-10 had higher turbidity (Table 2, Attachment C) than the other stations, which may account for the higher unfiltered methyl mercury results. The NYSDEC chronic water quality criterion for mercury for the protection of aquatic life is 770 ng/L (dissolved), and the NYSDEC criterion for the protection of human health based on fish consumption is 0.7 ng/L. There is currently no NYSDEC criterion for methyl mercury. The Oak Ridge National Laboratory Tier II Secondary Chronic Value for freshwater aquatic life is 2.8 ng/L[1]. Observed concentrations of methyl mercury detected at the three surface water sampling locations were well below this criterion.

[1] G. W. Suter, GW II and Tsao, CL. 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision. ES/ER/TM-96/R2. June.

Section 4

Fish Tissue Sampling

Sample Collection

Fish tissue samples were collected from two locations in the Patroon Creek (MR-FT-08 was immediately downstream from the Unnamed Tributary) and from one location in the I 90 Pond (Attachment A). One composite sample was taken at each location (MR-FT-08, MR-FT-09, and MR-FT-10). These sample stations are co-located with the sediment and surface water samples discussed above. Fish were captured by electroshocking (Model Halltech HT-2000 Battery Backpack Electrofisher, 300 volts).

For fish, timing of sampling is important. Periods of low to moderate stream flow (typically late summer or fall) are best for sampling fish. Sampling at this time also minimizes disturbance to the nests of fish as most young are mobile and are free swimmers. Samples were taken on November 4, 2015.

Prior to sampling, standard water quality measurements were made at each sampling location. A habitat evaluation sheet, which identifies physical and biological features of each habitat, was also completed for each location (see field data sheets in Attachment D). These data sheets record the field variables which documents habitat features for later comparison of species composition, abundance, and general health. During the fish sampling, for each individual fish, the following parameters were noted:

- Waterbody/location/depth or position in waterbody
- Species
- Length, in cm, measured from snout to lower part of tail
- Weight, in grams
- General appearance, special attention were given to physical malformations

Whole bodies of specimen fish were included in the sample. Once collected, fish samples were put on ice and shipped to the laboratory overnight. All fish tissue samples were analyzed for mercury by USEPA Method SW 846 7471A, percent lipid and percent solid.

Fish tissue samples were analyzed at TestAmerica Pittsburgh, which holds a National Environmental Laboratory Accreditation Program (NELAP) certification and accreditation in the State of New York (Certification ID 11182).

Analytical Data Validation

The analytical data were validated in accordance with the QAPP. A Data Usability Summary Report (DUSR; Attachment B) was prepared for the ecological verification sample data packages. The analytical data for fish tissue samples were determined to be acceptable for the intended purposes and none of the data were rejected or qualified.

Analytical Results

Fish samples were collected November 4, 2015, using a Halltech HT-2000 Battery Backpack Electrofisher. Fish collected at the upstream sample location (MR-FT-08) included 15 white suckers (*Catostomus commersoni*), one blacknose dace (*Rhinichthys atratulus*), and 1 crayfish (family *Cambaridae*). The white suckers ranged in size from 5.5 to 20.4 centimeters (cm), the blacknose dace was 1.15 cm and the cray fish was released prior to measurement; all appeared healthy with the exception of one injured white sucker. Most of the fish were released; three white suckers were retained for chemical analysis. At the midstream sample (MR-FT-09) 15 white suckers (4.5 to 12.7 cm), 10 blacknose dace (5.2 to 8.2 cm), five pumpkinseed (*Lepomis gibbosus*) (7.0 to 12.0 cm) and one green fog tadpole (family *Ranidae*) (5 cm) were captured; all appeared healthy. Three white suckers, one pumpkinseed and two blacknose dace were retained for chemical analysis. At the I-90 Pond sample location (MR-FT-10) 34 pumpkinseeds (2.7 to 9.1 cm), four white suckers (9.0 to 11.0 cm) and four bluegill (*Lepomis macrochirus*) (2.4 to 3.5 cm) were captured; all appeared healthy. Three white suckers and four pumpkinseeds were retained for chemical analysis.

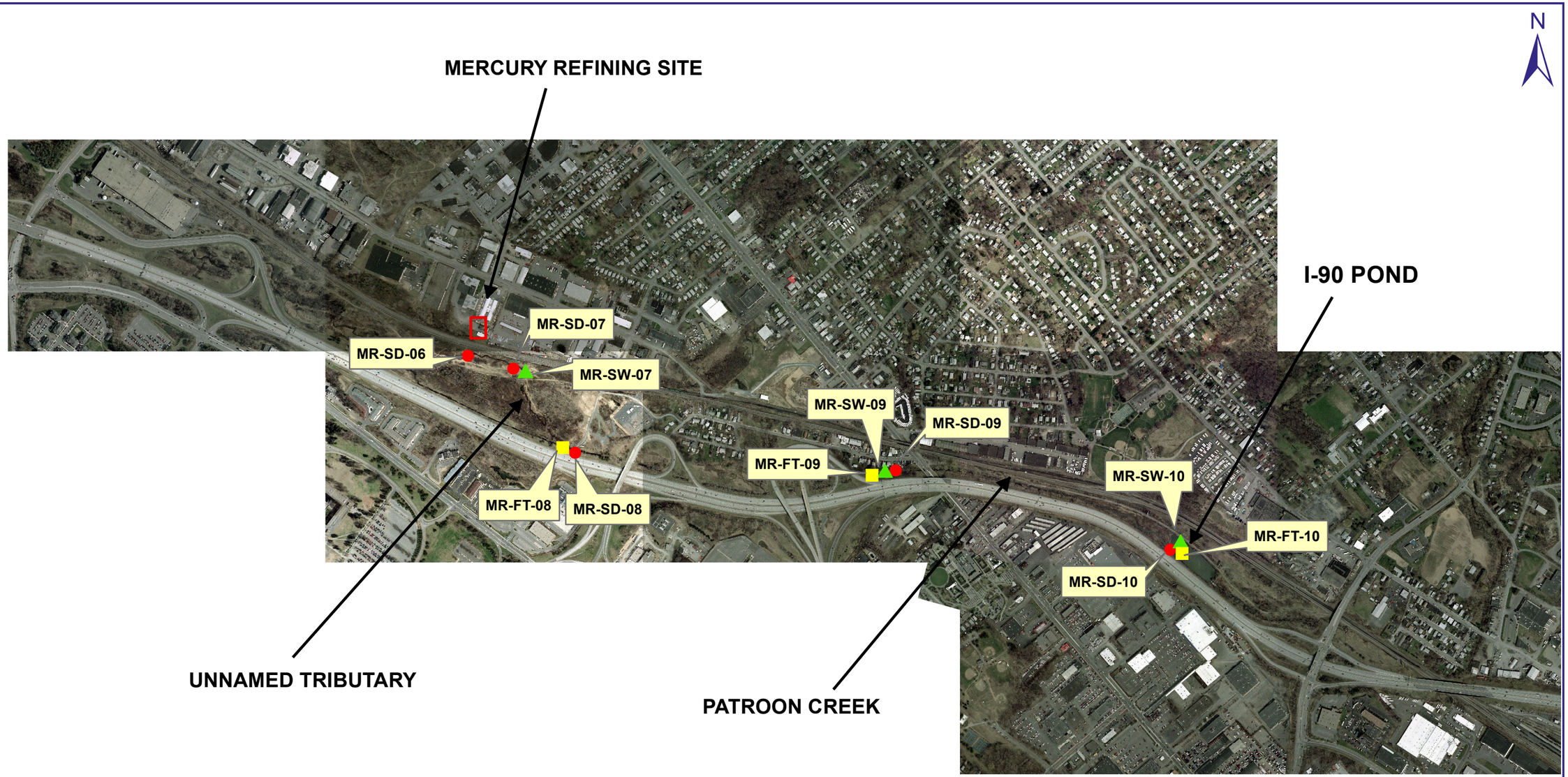
Results of the fish tissue analysis are provided in Table 1 of Attachment C. Mercury concentrations in fish tissue samples were non-detect at detection limits ranging from 0.21 to 0.25 mg/kg. These detection limits are below the USEPA target fish tissue concentration of 0.3 mg/kg[2] for methyl mercury. Percent lipids and percent moisture were comparable in the three samples.

Further evaluation of the results, including trend analysis, and conclusions and recommendations, will be provided in the Periodic Review Report to be submitted in March 2016.

[2] USEPA, 2009. Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, Final. January.

Attachment A: Site Plan

3/7/2016



Legend:

- MR-SD-04 Sediment Sample
- MR-SW-04 Surface Water Sample
- MR-FT-01 Fish Tissue Sample

Brown AND Caldwell

FIGURE 1
ECOLOGICAL SAMPLE LOCATIONS
MERCURY REFINING SUPERFUND SITE
COLONIE, NY

0 490 980
Feet

Author: BFTaylor Path: P:\GIS\Mercury_Refining_Superfund\Eco_Samples_022916.mxd

Attachment B: Data Usability Summary Report

QUALITATIVE
DATA USABILITY SUMMARY REPORT
Colonie, New York, Mercury Refining Site
November 2015 Fish Tissue, Surface Water, and Sediments

SDG Nos.: 180-49535-1, 240-57243-1, and 480-90056-1

Laboratories: TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania
TestAmerica Laboratories, Inc., North Canton, Ohio
TestAmerica Laboratories, Inc., Amherst, New York

Site: Mercury Refining Site, Colonie, New York

Date: January 13, 2016

Samples

Data from the following samples were reviewed:

Laboratory ID	Client ID	Matrix
180-49535-1	MR-FT-10-20151104	Tissue
180-49535-2	MR-FT-09-20151104	Tissue
180-49535-3	MR-FT-08-20151104	Tissue
240-57243-1	MR-SW-10	Water
240-57243-2	MR-SD-10	Sediment
240-57243-3	MR-SW-9	Water
240-57243-4	DUP-20151028-AQ	Water
240-57243-5	MR-SD-9	Sediment
240-57243-6	DUP-20151028-SED	Sediment
240-57243-7	FB-20151028-AQ	Water

240-57243-8	FB-20151028-SOIL	Sediment
240-57243-9	MR-SD-08	Sediment
480-90056-1	MR-SW-10	Water
480-90056-2	MR-SD-10	Sediment
480-90056-3	MR-SW-9	Water
480-90056-4	DUP-20151028-AQ	Water
480-90056-5	MR-SD-9	Sediment
480-90056-6	DUP-20151028-SED	Sediment
480-90056-7	FB-20151028-AQ	Water
480-90056-8	FB-20151028-SOIL	Sediment
480-90056-9	MR-SD-08	Sediment

A Qualitative Data Usability Review was performed on all analytical data from SDGs 180-49535-1, 240-57243-1, and 480-90056-1. The samples were collected at the Mercury Refining Site, in Colonie, New York. The following table outlines the analytical methods used to analyze the samples;

Analysis	Method
Mercury in Solids	SW846 7471B
Mercury in Water	SW846 7470A
Moisture	SM 2540G
Percent Lipids	TestAmerica SOP
Methyl Mercury	EPA 1630
Alkalinity	MCAWW 310.2
Total Organic Carbon	EPA Lloyd Kahn
Total Hardness	SM 2340C
Total Dissolved Solids	SM 2540C
Grain Size	D422

Samples were analyzed for all methods requested on the COCs.

This review was performed in accordance with the general guidance provided by the National Functional Guidelines for Data Review.

Review Items

The following were reviewed for the analyses in this report:

- Chain of Custodies (COCs)
- Case narrative
- Analysis data sheets (Form 1's)
- Holding time and sample preservation
- Lab Control Sample (LCS)/LCS duplicate (LCSD) recoveries and RPDs
- Field duplicate precision
- Blank contamination

Chains of Custody

The Chains-of Custody (COCs) were reviewed for completeness and accuracy. No issues noted.

Case Narrative

The case narratives were reviewed for completeness and accuracy. There were no discrepancies noted in the data that were not also mentioned in the case narratives.

Analysis Data Sheets (Form 1s)

The analysis data sheets were reviewed for completeness and accuracy. All requested results were present and accounted for.

Holding Time and Sample Preservation

None of the analysis holding times was violated and all samples were properly preserved.

LCS/LCSD Recoveries and RPDs

All LCS/LCSD recoveries and RPDs were within the laboratories statistically derived control

limits.

Field Duplicate Precision

All field duplicate RPDs were below 40 with the exceptions of;

Methyl mercury in samples MR-SD-9 and DUP-20151028-SED which had an RPD of 150. The methyl mercury results for samples MR-SD-9 and DUP-20151028-SED have been qualified as estimated (J flagged) due to field duplicate imprecision.

Most of the grain size results samples MR-SD-9 and DUP-20151028-SED had a field duplicate RPD above 40. These results have been qualified as estimated (J flagged) due to field duplicated imprecision.

Blank Contamination

All blanks were non detect.

Validation Qualifiers

The following validation qualifiers may have been applied to the data, as appropriate.

- J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ = The analyte was not detected above the sample method detection limit; and the method detection limit is approximate.
- U = 'The analyte was tested, but was not detected above the sample method detection limit.
- R = The sample result is rejected due to serious deficiencies. The presence or absence of the analyte cannot be verified.

Summary Evaluation of Data and Potential Usability Issues

The data are acceptable for the intended purposes. No data were rejected as a result of this review. Field duplicate imprecision for the sediment samples MR-SD-9 and DUP-20151028-SED exceeded the control limit for methyl mercury and most grain size parameters. These results have been qualified as estimated (J flagged). Estimated results should be used with caution.

Signed  Dated: 1/11/2016

Gregory J. Cole
Senior Chemist

QUALITATIVE
DATA USABILITY SUMMARY REPORT
Colonie, New York, Mercury Refining Site
January 2016 Surface Water, and Sediments

SDG Nos.: 480-94392-1

Laboratories: TestAmerica Laboratories, Inc., Amherst, New York

Site: Mercury Refining Site, Colonie, New York

Date: March 8, 2016

Samples

Data from the following samples were reviewed:

Laboratory ID	Client ID	Matrix
480-94392-1	MR-SD-06	Solid
480-94392-2	MR-SD-07	Solid
480-94392-3	DUP-012616-SD	Solid
480-94392-4	MR-SW-07	Water
480-94392-5	DUP-012616-SW	Water
480-94392-6	FB-012616-SW	Water
480-94392-7	FB-012616-SD	Water

A Qualitative Data Usability Review was performed on all analytical data from SDG 480-94392-1. The samples were collected at the Mercury Refining Site, in Colonie, New York. The following table outlines the analytical methods used to analyze the samples;

Analysis	Method
Mercury in Solids	SW846 7471B
Mercury in Water	SW846 7470A
Moisture	SM 2540G
Methyl Mercury	EPA 1630
Alkalinity	MCAWW 310.2
Total Organic Carbon	EPA Lloyd Kahn
Total Hardness	SM 2340C
Total Dissolved Solids	SM 2540C
Grain Size	D422

Samples were analyzed for all methods requested on the COCs.

This review was performed in accordance with the general guidance provided by the National Functional Guidelines for Data Review.

Review Items

The following were reviewed for the analyses in this report:

- Chain of Custodies (COCs)
- Case narrative
- Analysis data sheets (Form 1's)
- Holding time and sample preservation
- Lab Control Sample (LCS)/LCS duplicate (LCSD) recoveries and RPDs
- Matrix Spike (MS)/MS duplicate (MSD) recoveries and RPDs
- Field duplicate precision
- Lab replicate precision
- Blank contamination

Chains of Custody

The Chains-of Custody (COCs) were reviewed for completeness and accuracy. No issues noted.

Case Narrative

The case narratives were reviewed for completeness and accuracy. There were no discrepancies noted in the data that were not also mentioned in the case narratives.

Analysis Data Sheets (Form 1s)

The analysis data sheets were reviewed for completeness and accuracy. All requested results were present and accounted for.

Holding Time and Sample Preservation

None of the analysis holding times was violated and all samples were properly preserved.

LCS/LCSD Recoveries and RPDs

All LCS/LCSD recoveries and RPDs were within the laboratories statistically derived control limits.

MS/MSD Recoveries and RPDs

All MS/MSD recoveries and RPDs were within the laboratories statistically derived control limits with the exception of a low recovery for mercury in the MS for sample MR-SD-06. The mercury result for sample MR-SD-06 has been qualified as estimated (J flagged).

Field Duplicate Precision

All field duplicate RPDs were below 40.

Lab Replicate Precision

All laboratory replicate RPDs were below 40 with the exception of total organic carbon for sample MR-SD-06. The TOC result for sample MR-SD-06 has been qualified as estimated (J flagged).

Blank Contamination

All blanks were non detect with the exception of a trace amount of alkalinity in the method blanks associated with samples DUP-012616-SW and FB-012616 and the field blank, FB-012616-SD. The alkalinity results for the associated samples far exceed the concentrations found in the samples and no qualification was warranted.

Validation Qualifiers

The following validation qualifiers may have been applied to the data, as appropriate.

- J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ = The analyte was not detected above the sample method detection limit; and the method detection limit is approximate.
- U = 'The analyte was tested, but was not detected above the sample method detection limit.
- R = The sample result is rejected due to serious deficiencies. The presence or absence of the analyte cannot be verified.

Summary Evaluation of Data and Potential Usability Issues

The data are acceptable for the intended purposes. No data were rejected as a result of this review. Field duplicate imprecision for the sediment samples MR-SD-07 and DUP-012616-SD exceeded the control limit for some grain size parameters. These results have been qualified as estimated (J flagged). A low recovery for mercury in the MS for sample MR-SD-06 resulted in the mercury result for sample MR-SD-06 being qualified as estimated (J flagged). The TOC result for sample MR-SD-06 has been qualified as estimated (J flagged) due to laboratory replicate imprecision. Estimated results should be used with caution.

Signed  Dated: 3/8/2016

Gregory J. Cole
Senior Chemist

Attachment C: Ecological Verification Sampling Results

TABLE 1
ECOLOGICAL ANALYTICAL RESULTS
MERCURY REFINING SUPERFUND SITE
POST-REMEDIAL MONITORING
COLONIE, NEW YORK

Analyte	Location / Sample Date / Units	MR-SD-06 1/26/2016	MR-SD-07 1/26/2016	MR-SD-07 DUP 1/26/2016	MR-SD-08 10/28/2015	MR-SD-09 10/28/2015	MR-SD-09 DUP 10/28/2015	MR-SD-10 10/28/2015
Sediment Results								
Mercury	mg/kg	0.32 J	0.57	0.64	0.31	0.067	0.43	0.1
Methyl Mercury	µg/kg	0.31	0.21	0.29 J	0.082 J	0.095 J	0.63 J	0.58
Total Organic Carbon	mg/kg	28600 J	4370	5320	3170	6880	4950	42100

Constituent	Location / Sample Date / Units	MW-SW-07 1/26/2016	MW-SW-07 DUP 1/26/2016	MR-SW-09 10/28/2015	MR-SW-09 DUP 10/28/2015	MR-SW-10 10/28/2015
Surface Water Results						
Mercury	µg/L	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Methyl Mercury	ng/L	0.034 J	0.040 J	0.047 J	0.046 J	0.17

Constituent	Location / Sample Date / Units	MR-FT-08 11/4/2015	MR-FT-09 11/4/2015	MR-FT-10 11/4/2015
Fish Tissue Results				
Mercury	mg/kg	0.21 U	0.25 U	0.24 U
Lipids	%	0.86	1	2.5
Solids	%	23	22	23

Notes:
U - The analyte was tested for, but was not deteted above the sample method detection limit.
J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

TABLE 2
ECOLOGICAL VERIFICATION SEDIMENT SAMPLE GRAIN SIZE RESULTS
MERCURY REFINING SUPERFUND SITE
POST-REMEDIAL MONITORING
COLONIE, NEW YORK

Location	Analyte	Results	Unit
MR-SD-06	Clay	0.2	%
	Silt	1.9	%
	Fine Sand	9.5	%
	Medium Sand	24.3	%
	Coarse Sand	32.4	%
	Total Sand	66.2	%
	Gravel	31.7	%
MR-SD-07	Clay	0.2	%
	Silt	2.2	%
	Fine Sand	22.9	%
	Medium Sand	26	%
	Coarse Sand	26.6	%
	Total Sand	75.5	%
	Gravel	22.1	%
MR-SD-08	Clay	1.1	%
	Silt	5.6	%
	Fine Sand	86.1	%
	Medium Sand	3.8	%
	Coarse Sand	1.1	%
	Total Sand	91	%
	Gravel	2.3	%
MR-SD-09	Clay	0.5	%
	Silt	1.9	%
	Fine Sand	37.7	%
	Medium Sand	27.3	%
	Coarse Sand	15	%
	Total Sand	80	%
	Gravel	17.6	%

TABLE 2
ECOLOGICAL VERIFICATION SEDIMENT SAMPLE GRAIN SIZE RESULTS
MERCURY REFINING SUPERFUND SITE
POST-REMEDIAL MONITORING
COLONIE, NEW YORK

Location	Analyte	Results	Unit
MR-SD-10	Clay	2.6	%
	Silt	32.5	%
	Fine Sand	53.4	%
	Medium Sand	9.2	%
	Coarse Sand	2.3	%
	Total Sand	64.9	%
	Gravel	0	%

= Primary Grain Size

TABLE 3
SURFACE WATER FIELD PARAMETERS
MERCURY REFINING SUPERFUND SITE
POST-REMEDIAL MONITORING
COLONIE, NEW YORK

Parameter	Location / Sample Date / Units	MR-SD-06 1/26/2016	MR-SD/SW-07 1/26/2016	MR-SD-08 10/28/2015	MR-SD/SW-09 10/28/2015	MR-SD/SW-10 10/28/2015
Temperature	°C	4.45	4.58	8.63	8.4	6.88
pH	--	8.12	8.1	6.69	6.36	6.07
ORP	mV	218	2.4	1.53	1.52	263
COND	S/m	2.04	2.01	250	248	1.03
DO	mg/L	7.57	5.93	9.85	10.45	3.56
Turbidity	NTU	9.9	11	5.5	5.1	55.9

Notes:
°C - degrees centigrade
S/m - Siemens per meter
mV - millivolts
mg/L - milligrams per liter
NTU - nephelometric turbidity units

Attachment D: Fish Tissue Sampling Field Data Sheets

Fish Sampling Data Form **Date: 11-4-2015** **Page: 1 of 2**

Study Area: Mereco Site upstream sample
Sample Number: MR-FT-08
Lat N_'42.688167_ Lon W_'-73.810794_ GPS River basin: N/A
Investigators: Finch, Baird **Time: 2-3pm**
MacDougall

Weather:
Weather: (Last 24 hours) Warm, sunny - heavy rain within last week

Equipment Used:
Gear X back pack (Model: HallTech) □ seine (Size/mesh: _____) □ other _____
Block nets used? □ Upstream □ Downstr X None Barrier extent □ Upstream □ Downstream
Sampling Duration Start time ~2:00 pm End time ~3:00 pm Shock seconds _____
Specific conductance 1.36 µS/cm Shocker voltage_____ Shocker settings **DO 12.72 mg/L**
Water temp 11.62°C **7.99 pH**
Coincident with habitat survey? □ Yes X No
No Reference reach candidate? □ Yes X No
Habitat Description:
Swift flowing stream ~2-4 ft deep. Under cut bank with dense herbaceous and shrub vegetation right up to and overhanging stream. Hard gravel/rock bottom.
HABITAT TYPES
Indicate the percentage of each habitat type present
X Riffles 10% X Pools 10% X Runs 80% □ Snags_____%
X Submerged Macrophytes 1% □ Other ( )_____%

Species	Length	Condition	Total Number
White Sucker	240 mm	healthy	
	222	healthy	
	240	healthy	
	230	healthy	
	225	healthy	
	220	healthy	
	180	healthy	
	142	healthy	
	55	injured	
	81	healthy	
	55	healthy	
	73	healthy	
	63	healthy	
	60.0	healthy	
	61	healthy	15
Blacknose dace	115	healthy	1
Crawfish	N/A	healthy	

16 fish

Aquatic Habitat Assessment Sheet (MR-FT-08) **Date 11-4-2015**

Waterbody Type: Stream
Waterbody Name: __Patroon Creek__

Instream Features (within 300 feet)		cut bank - significant fish habitat, rocks on bottom, algae covered
Estimated Stream Width (ft):		10-12 ft
Estimated Stream Depth (ft):		~2 ft
Surface Velocity (ft/sec):		moderate
State Water Quality Classification		863-712 NYSDEC Standard C(T) Class C
Stream/River Segment: _____		
Canopy Cover		20% trees 20% shrubs Total 40
Dominant Substrate(s)	(Circle)	Boulder/**Cobble Gravel** Sand Silt Mud Concrete Rip-rap
Water Odors: N/A		Normal/None Sewage Petroleum Chemical Fishy Other - None
Turbidity: Clear		Clear, slightly turbid, turbid, opaque, stained
		Forest, Commercial, Pasture, Agricultural, Residential, Industrial
		Highway right next to stream
		Overhead electrical

Collected for tissue sampling 3 white suckers which included the injured individual.

Fish Sampling Data Form **Date: 11-4-2015** **Page: 1 of 2**

Study Area: Mereco stream sampling - midstream- behind Unique Auto
Sample Number: MR- FT- 09
Lat N_'42.687578_ Lon W_'-73.799507_ GPS River basin: N/A
Investigators: Finch, Steve **Time:** **12-1:00pm**
D. MacDougall, E. Baird

Weather:
Weather: (Last 24 hours) Warm, sunny - heavy rain within last week

Equipment Used:
Gear X back pack (Model: HallTech) □ seine (Size/mesh: _____) □ other _____
Block nets used? □ Upstream □ Downstr X None Barrier extent □ Upstream □ Downstream
Sampling Duration Start time 12:00 End time 1:00 Shock seconds _60hz_ **DO 2.39 mg/L**
Specific conductance _1.358_µS/cm Shocker voltage__100_ Shocker settings **8.01 pH**
Water temp 11.64°C
Coincident with habitat survey? □ Yes X No
No Reference reach candidate? □ Yes X No
Habitat Description:
Fast flowing deep channel stream, large pipe entering stream nearby, significant woody debris (logs) in stream, located in urban area. Very good canopy 70%+

HABITAT TYPES
Indicate the percentage of each habitat type present
X Riffles 45% □ Pools_____% X Runs 45% X Snags 10%
□ Submerged Macrophytes_____% □ Other ( )_____%
none noted

Species	Length (mm)	Condition	Total Number	Species	Length (mm)	Condition	Total Number
White Sucker	110	healthy		**Blacknosed Dace**	82	healthy	
	119	healthy			62	healthy	
	65	healthy			64	healthy	
	60	healthy			65	healthy	
	95	healthy			65	healthy	
	64	healthy			67	healthy	
	105	healthy			60	healthy	
	68	healthy			52	healthy	
	57	healthy			70	healthy	
	127	healthy			65	healthy	10
	110	healthy					
	67	healthy		**Pumpkinseed**	75	healthy	
	45	healthy			72	healthy	
	59	healthy			70	healthy	
	60	healthy	15		85	healthy	
					120	healthy	5
				Green frog tadpole	50	healthy	1

30 fish, all small

Aquatic Habitat Assessment Sheet (MR-FT-09) **Date 11-4-2015**

Waterbody Type: Stream- behind Unique Auto
Waterbody Name: _Patroon Creek_

Instream Features (within 300 feet)		significant woody debris, some gravel bar/deposits, large culvert pipe (storm overflow)
Estimated Stream Width (ft):		15 ft
Estimated Stream Depth (ft):		0-3 ft
Surface Velocity (ft/sec):		modearte-
State Water Quality Classification		863-712 NYSDEC Standard C(T) Class C
Stream/River Segment: _____		
Canopy Cover		70+%
Dominant Substrate(s)	(Circle)	Boulder/**Cobble Gravel Sand Silt Mud** Concrete Rip-rap **None (slopes vegetated)** **Even amount**
Water Odors: NA		Normal/None Sewage Petroleum Chemical Fishy Other_____
Turbidity: Mostly clear		Clear, slightly turbid, turbid, opaque, stained **None**
		Forest, Commercial, Pasture, Agricultural, Residential, Industrial
		Highway, parking lots near by

Collected for tissue sampling 3 white suckers, 1 pumpkinseed sunfish, 2 blacknose dace

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Fish Sampling Data Form **Date: 11/4/2015** **Page: 1 of 2**

Study Area: I90 Pond

Sample Number: MR-FT-10

Lat N '42.687578 Lon W '-73.799507 GPS River basin: N/A

Investigators: S. Finch, D. MacDougall, E. Baird **Time: 10-11:00**

Weather:

Weather: (Last 24) hours Warm, sunny - heavy rain within last week

Equipment Used:

Gear X back pack (Model: HallTech) □ seine (Size/mesh: _____) □ other _____

Block nets used? □ Upstream □ Downstr X None Barrier extent □ Upstream □ Downstream

Sampling Duration Start time ~10:00 End time11:00 Shock seconds 80 Hz

Specific conductance 1.315 µS/cm Shocker voltage_____ Shocker settings 50 volts

Water temp 10.75 °C

Coincident with habitat survey? □ Yes X No **9.41 mg/L DO** **6.6 Turbidity**

No Reference reach candidate? □ Yes X No **7.83 pH**

Habitat Description:

Large open, back water area - large carp present - deep muck present - stream channel to the south

HABITAT TYPES

Indicate the percentage of each habitat type present

□ Riffles_____% X Pools 100% □ Runs_____% □ Snags_____%

□ Submerged Macrophytes_____% □ Other ( )_____% None

Species	Length (mm)	Condition	Species	Length (mm)	Condition	Species	Length (mm)	Condition	Total Number
Pumpkinseed	57	healthy	Pumpkinseed	27	healthy	Pumpkinseed	36	healthy	
	58	healthy		27	healthy		36	healthy	
	91	healthy		51	healthy		51	healthy	34
	84	healthy		45	healthy				
	71	healthy		28	healthy	Bluegill	35	healthy	4
	63	healthy		32	healthy		24	healthy	
	76	healthy		45	healthy		28	healthy	
	34	healthy		42	healthy		29	healthy	
	51	healthy		34	healthy				
	45	healthy		39	healthy	White sucker	110	healthy	4
	49.0	healthy		32.0	healthy		93.0	healthy	
	42	healthy		33	healthy		90	healthy	
	37.0	healthy		32.0	healthy		103.0	healthy	
	41	healthy		34	healthy				
									38 fish, all small

Aquatic Habitat Assessment Sheet **MR-FT-10** **Date 11/4/2015**

Waterbody Type: Pond/Stream
Waterbody Name: I90 Pond

Instream Features (within 300 feet)		mud flat - dense cattail area
Estimated Stream Width (ft):		40
Estimated Stream Depth (ft):		2-3 ft where sampled - muck possible 3 ft
Surface Velocity (ft/sec):		None
State Water Quality Classification		863-711 NYSDEC Standard C Class C
Stream/River Segment: _____		
Canopy Cover		0%
Dominant Substrate(s)	(Circle)	Boulder/Cobble Gravel Sand Silt Mud Concrete Rip-rap
Water Odors: None		Normal/None Sewage Petroleum Chemical Fishy Other_NA
Turbidity: Fairly clear with some silt		Clear, slightly turbid, turbid, opaque, stained
Near highway and rail line		Forest, Commercial, Pasture, Agricultural, Residential, Industrial

Collected for tissue sampling 3 white suckers, 4 pumpkinseed sunfish