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NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

New York State Department of Environmental Conservation

Oswego Castings Site 2017 Annual Groundwater Monitoring Report

NYSDEC Site Number 7-38-033

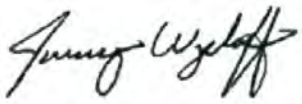
April 2018

OSWEGO CASTINGS SITE 2017 ANNUAL GROUNDWATER MONITORING REPORT

NYSDEC Site Number 7-38-033

Andy Vitolins

Associate Vice President



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00266404.0000

Date:

April 2018

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ACRONYMS AND ABBREVIATIONS

amsl	Above Mean Sea Level
DNAPL	Dense Non-Aqueous Phase Liquid
DO	Dissolved Oxygen
MW	Monitoring Well
NYSDEC	New York State Department of Environmental Conservation
OM&M	Operation Maintenance and Monitoring
OU	Operable Unit
PCBs	Poly-chlorinated Biphenyls
PFAS	Perfluorinated Alkyl Substances
PFBS	Perfluorobutanesulfonic Acid
PFHpA	Perfluoroheptanoic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
REDOX	Oxidation-Reduction Potential
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
TDS	Total Dissolved Solids
ug/L	Micrograms per liter
ng/L	Nanograms per liter
USEPA	United States Environmental Protection Agency

1 INTRODUCTION

The New York State Department of Environmental Conservation (NYSDEC) has issued a Work Assignment (# D007618-11) to Arcadis CE, Inc. (Arcadis), for Operation, Maintenance, and Monitoring (OM&M) at the Oswego Castings Site (NYSDEC site number 7-38-033) in Oswego, Oswego County, New York. This report has been prepared to summarize the 2017 annual OM&M activities.

2 SITE DESCRIPTION AND BACKGROUND

2.1 Description

The Oswego Castings site is located at 375 Mitchell Street, Oswego, Oswego County, New York (Figure 2-1). The site is approximately 10 acres and contains three former manufacturing buildings. A former cooling water pond is located west of the buildings. The site is currently zoned industrial and was most-recently the location of a saw mill operation. The site is listed as a Class 04 site on the NYSDEC Registry of Inactive Hazardous Waste Sites.

2.2 Background

The site was formerly owned by B and K Metals Inc. (B&K Metals). Oswego Castings Inc., a subsidiary of Oberdorfer Foundries, Inc. operated an aluminum die casting facility on the site from 1956 to 1986. Polychlorinated biphenyls (PCBs) were detected on the site in core sands, foundry waste, and wastewater discharged to a process line/septic tank discharge line. The expected sources of the PCBs include leaks in hydraulic equipment and binders or coatings applied to core sand surfaces. In July 1993 B&K Metals entered into an Order on Consent with the NYSDEC for a Remedial Investigation/Feasibility Study (RI/FS). The RI/FS was conducted between July 1993 and February 1997. A Record of Decision (ROD) was issued for Operational Unit (OU)-1 in 1997. The OU-1 ROD required excavation of approximately 4,100 cubic yards of soil, sediment, and foundry sand. In addition, the ROD called for removal of the septic tank and placement of crushed stone over the existing on-site landfill. A ROD for OU-2 was issued in 2000, requiring construction of a concrete pad over the yard area and floor of the saw mill (Figure 2-2).

In May 2010 the stone buffer for the landfill was re-graded and landscape fabric and new stone were applied to the landfill cap. In April 2010, groundwater monitoring well MW-2 was replaced and three new monitoring wells were installed (MW-5, MW-6, and MW-7).

An Environmental Notice (EN) was placed on the site in November 2011. The purpose of the EN was to limit the use of the site to industrial and/or commercial use; prevent owners from tampering with the remedial action; prevent use of on-site groundwater; and grant access to the NYSDEC and its agents for purposes of maintaining the remedy.

OM&M activities are completed in accordance with a NYSDEC-approved Site Management Plan (SMP) that was last updated in 2016 (Arcadis 2016).

3 OPERATION AND MAINTENANCE

O&M activities were performed on October 26, 2017 in accordance with the SMP by Arcadis and included inspection of the respective landfill and yard area protective covers and pond area (Figure 2-2). An O&M Checklist (Appendix A) was used to document the findings of the inspection. A photograph log of the site is provided in Appendix B. A discussion of the findings is provided in the following sections.

3.1 Landfill Cover

A visual inspection of the landfill cover was performed to assess the landfill for erosion, settlement, ponded water, burrowing rodents, and brush or woody vegetation. As shown in the O&M Checklist (Appendix A) and photograph log (Appendix B), brush and thick vegetation are present across the cover and near the groundwater monitoring wells. No additional issues were noted.

3.2 Concrete Cover

A visual inspection of the concrete cover was performed to inspect the integrity of the remedy. As shown in Appendix A, the concrete cap had minor cracks but did not contain evidence of settlement or other damage. As shown in Appendix A and Appendix B, debris (primarily wood chips and boards) were present on the concrete cap.

3.3 Pond Area

A visual inspection of the pond area was performed to inspect the banks of the pond for erosion or areas of sparse vegetation. No erosion issues were identified and vegetation along the perimeter of the pond appeared to be well established.

3.4 General Site Conditions

3.4.1 Buildings and Grounds

As shown in Appendix B, the buildings at the site are generally not secured. Based on exterior inspections of the interior of the buildings, metal components are located in two of the site buildings. Trucks and equipment are also being stored on the concrete cover and within one of the buildings. Plastic drums were also identified in a closed yard between two of the site buildings. A fallen tree has partially damaged the site boundary fence in the southeast section of the property.

4 GROUNDWATER MONITORING PROGRAM

Groundwater monitoring wells were sampled on October 26 and October 27, 2017 by Arcadis and Precision Environmental Services (PES) to provide information on groundwater quality, monitor contaminant migration, and assess hydrogeologic site conditions, including groundwater flow direction. Groundwater monitoring well locations are shown on Figure 4-1.

4.1 Groundwater Monitoring Well Inspection

The integrity of each well was inspected, and the results recorded on a groundwater monitoring well inspection form (Appendix C). Photographs of each well are also provided in Appendix B. As indicated on the inspection forms and shown in the photographs, the monitoring wells are in acceptable condition and no significant problems were reported.

4.2 Water Level Survey

Prior to collecting groundwater samples, water levels were measured to the nearest hundredth of a foot. A summary of these data is presented on the groundwater level data form in Appendix D.

As shown in Appendix C, a trace amount of dense, non-aqueous phase liquid (DNAPL) was observed on the water level probe after measuring the depth to bottom of groundwater monitoring well MW-1. The last detection of DNAPL in this well was during the 2016 groundwater sampling event (Arcadis 2017). During the 2016 event, DNAPL was identified on the tip of the water level probe after it was removed from the well.

None of the other monitoring wells contained evidence of NAPL.

Table 4-1 and Appendix D summarizes the groundwater elevation data. A potentiometric surface map is provided on Figure 4-2. As shown in Table 4-1, groundwater elevations ranged from 306.24 ft amsl at MW-5 to 320.84 ft amsl at MW-6. The average groundwater elevation across the site is approximately five feet higher compared to the previous (September 2016) sampling event. However, as shown in Table 4-1, the October 2017 elevations are comparable to the historic seasonal elevation data. As shown on Figure 4-2, the direction of groundwater flow is generally toward the northwest.

4.3 Groundwater Sampling

Groundwater samples were collected from seven groundwater monitoring wells (MW-1, MW-2R, MW-3, MW-4, MW-5, MW-6, and MW-7) using low-flow groundwater purging and sampling procedures.

Prior to collecting groundwater samples, pH, conductivity, turbidity, dissolved oxygen (DO), temperature, and REDOX were measured using a Horiba U-52 water quality meter and recorded on groundwater sampling purge logs. A duplicate sample (MW-X) was collected from MW-2R. Groundwater sampling purge logs are presented in Appendix E.

Groundwater samples were collected and submitted to Spectrum Analytical by chain-of-custody procedures and analyzed for PCBs by USEPA Method 8082. In addition, at the request of NYSDEC,

groundwater samples were also analyzed for Perfluorinated Alkyl Substances (PFAS) by USEPA Method 537 Modified, and 1,4-Dioxane by USEPA Method 8260C SIM by TestAmerica.

The laboratory analytical data are provided in Appendix F.

The site is currently being sampled every five quarters in accordance with the SMP, therefore, the next groundwater sampling event will be conducted during the first quarter 2019.

4.4 Groundwater Sampling Results

Groundwater sampling results are summarized in Table 4-2 (PCBs), and Table 4-3 (PFAS and 1,4-Dioxane).

As shown in Table 4-2, the groundwater sample collected from MW-1 contained PCBs at concentrations that exceed the corresponding NYSDEC Class GA Standard of 0.09 µg/L. PCB Aroclor-1248 and Aroclor-1260 were detected at 28.6 micrograms per liter (µg/L) and 1.4 µg/L, respectively. The groundwater samples collected from MW-3 and MW-4 contained PCB Aroclor-1248 at concentrations of 0.643 µg/L and 0.89 µg/L, respectively. These values are generally consistent with historical results. Table 4-2 shows none of the other groundwater samples contained concentrations of PCBs greater than the indicated quantitation limits during this sampling event. PCB Aroclor-1248 was detected in MW-5 at a concentration of 0.26 µg/L in September 2016 and was not detected during this sampling event. Since 2012, PCBs have not been detected at MW-5 with the exception of Aroclor-1248 during the 2016 sampling event.

As shown in Table 4-3, estimated concentrations of perfluorobutanesulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), and perfluorooctanesulfonic acid (PFOS) were detected in the sample collected from MW-2 at concentrations of 1.42 nanograms per liter (ng/L), 1.65 ng/L and 1.96 ng/L, respectively. Perfluorooctanoic acid (PFOA) was also detected in the sample collected from MW-2 at a concentration of 3.02 ng/L. No other PFAS were detected during the fourth quarter 2017 event. Table 4-3 shows that 1,4 dioxane was not detected in any of the groundwater samples at the indicated quantitation limit.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The landfill and yard area protective covers are in acceptable condition and operating as intended. In addition, there are no visible signs of erosion or sparse vegetation in the pond area. Although wood and/or other debris is present on each of the protective cover areas, it is not impacting the performance of the cover systems. Minor cracks are visible in the concrete cover; however, they do not appear to be impacting the integrity of the protective cover.

Monitoring well MW-1 showed evidence of DNAPL during the water level survey. Based on groundwater level data, the direction of groundwater flow is generally toward the northwest. The samples collected from groundwater monitoring wells MW-1, MW-3, and MW-4 contained PCBs at concentrations greater than the respective NYSDEC Class GA Standard. None of the other groundwater samples collected from the site contained detectable concentrations of PCBs, including down-gradient monitoring well MW-7.

At the request of the NYSDEC, all monitoring wells were sampled for PFAS. PFAS was detected in MW-2, however, the concentrations were below the USEPA Public Health Advisory Limit for drinking water.

5.2 Recommendations

Based on the concentrations of PCBs in groundwater, and the detection of DNAPL in monitoring well MW-1, annual groundwater monitoring should continue to be conducted to evaluate the impacts to groundwater quality over time.

6 SUMMARY

O&M activities were conducted on October 26 and October 27, 2017. The landfill and yard area protective covers and pond area were inspected and appear to be performing as intended. The site is currently being used as storage for trucks and equipment.

Monitoring wells were inspected and are in acceptable condition. Groundwater levels indicate that the direction of groundwater flow across the site is generally towards the northwest.

DNAPL was identified in monitoring well MW-1. The last detection of DNAPL in this well was in 2016.

Groundwater samples contained concentrations of PCB greater than the corresponding NYSDEC Standards at three sampling locations. Low levels of PFAS were detected in MW-2, however, the concentrations were below the USEPA Public Health Advisory for drinking water. 1,4-dioxane was not detected in any of the groundwater samples.

7 REFERENCES

Arcadis 2017, Oswego Castings Site 2016 Annual Groundwater Monitoring Report, NYSDEC Site Number 7-38-033, February 2017.

TABLES

Table 4-1
Groundwater Elevation Data
Oswego Castings Site
NYSDEC Site Number 738033

		9/25/2012		10/17/2013		4/23/2015		9/13/2016		10/26/2017	
Well	**Measuring Point Elevation**	**Depth to Water**	**Groundwater Elevation**	**Depth to Water**	**Groundwater Elevation**	**Depth to Water**	**Groundwater Elevation**	**Depth to Water**	**Groundwater Elevation**	**Depth to Water**	**Groundwater Elevation**
	Ft AMSL	Ft BTOC	Ft amsl	Ft BTOC	Ft amsl	Ft BTOC	Ft amsl	Ft BTOC	Ft amsl	Ft BTOC	Ft amsl
MW-1	313.29	10.85	302.44	5.37	307.92	2.82	310.47	9.65	303.64	4.78	308.51
MW-2R	313.11	6.67	306.44	3.13	309.98	2.42	310.69	6.32	306.79	3.73	309.38
MW-3	311.72	10.61	301.11	6.45	305.27	2.43	309.29	9.69	302.03	3.00	308.72
MW-4	312.45	4.46	307.99	3.80	308.65	3.04	309.41	5.11	307.34	3.72	308.73
MW-5	312.70	14.91	297.79	9.55	303.15	4.88	307.82	14.91	297.79	6.46	306.24
MW-6	331.82	14.35	317.47	10.85	320.97	6.82	325.00	14.68	317.14	10.98	320.84
MW-7	314.11	12.20	301.91	6.54	307.57	2.70	311.41	12.82	301.29	5.58	308.53

Notes:
Ft AMSL - feet above mean sea level
Ft BTOC - feet below top of casing

Table 4-2
Summary of Groundwater
Sampling Results - PCBs

Oswego Casting Site

Site Number 7-38-033

Sample ID	NYSDEC	MW-1	MW-1	MW-1	MW-1	MW-1	MW-2R	MW-2R	MW-2R	MW-2R	MW-X*	MW-2R	MW-X*	MW-3	MW-3	MW-3	MW-3	MW-3	MW-4	MW-4
Sampling Date	Class GA Standards	9/25/2012	10/17/2013	4/23/2015	9/13/2016	10/26/2017	9/24/2012	10/17/2013	4/23/2015	9/13/2016	9/13/2016	10/26/2017	10/26/2017	9/24/2012	10/17/2013	4/23/2015	9/13/2016	10/26/2017	9/24/2012	10/17/2013
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
PCBs																				
Aroclor-1016	**0.09****	**54**	5.0 U	5.0 U	1.0 U	0.2 U	0.17 U	0.05 U	0.05 U	0.05 U	0.05 U	0.19 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.2 U	0.17 U	0.05 U
Aroclor-1221	**0.09****	0.17 U	5.0 U	5.0 U	1.0 U	0.2 U	0.17 U	0.05 U	0.05 U	0.05 U	0.05 U	0.19 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.2 U	0.17 U	0.05 U
Aroclor-1232	**0.09****	0.17 U	5.0 U	5.0 U	1.0 U	0.2 U	0.17 U	0.05 U	0.05 U	0.05 U	0.05 U	0.19 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.2 U	0.17 U	0.05 U
Aroclor-1242	**0.09****	0.17 U	5.0 U	5.0 U	1.0 U	0.2 U	0.17 U	0.05 U	0.05 U	0.05 U	0.05 U	0.19 U	0.19 U	0.17 U	**0.13**	0.05 U	0.05 U	0.2 U	0.17 U	**0.89**
Aroclor-1248	**0.09****	0.17 U	**29**	**120**	**9.9 P**	**28.6**	0.17 U	0.05 U	0.05 U	0.05 U	0.05 U	0.19 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	**0.643**	0.17 U	0.05 U
Aroclor-1254	**0.09****	0.17 U	5.0 U	5.0 U	1.0 U	0.2 U	0.17 U	0.05 U	0.05 U	0.05 U	0.05 U	0.19 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.2 U	0.17 U	0.05 U
Aroclor-1260	**0.09****	0.17 U	5.0 U	5.0 U	1.0 U	**1.4**	0.17 U	0.05 U	0.05 U	0.05 U	0.05 U	0.19 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.2 U	0.17 U	0.05 U
Aroclor-1262	**0.09****	NA	5.0 U	5.0 U	1.0 U	0..2 U	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.19 U	0.19 U	NA	0.05 U	0.05 U	0.05 U	0.2 U	NA	0.05 U
Aroclor-1268	**0.09****	NA	5.0 U	5.0 U	1.0 U	0.2 U	NA	0.05 U	0.05 U	0.05 U	0.05 U	0.19 U	0.19 U	NA	0.05 U	0.05 U	0.05 U	0.2 U	NA	0.05 U

Notes:
- Concentration exceeds NYSDEC Class GA Standard.
U - Compound was not detected at the indicated concentration.
J - Compound detected below the reporting limit or reported concentration is estimated.
P - This flag is used for pesticides/PCB/herbicide compound when there is a greater than 40%
difference for detected concentration between the two GC columns used for primary and confirmation analyses.
This difference typically indicates interference, causing one value to be unusually high.
* - MW-X is a duplicate sample collected from MW-2R
** - Sum of these compounds can not exceed 0.09 ug/L.
NA - Compound not analyzed

Table 4-2
Summary of Groundwater
Sampling Results - PCBs

Oswego Casting Site

Site Number 7-38-033

Sample ID	NYSDEC	MW-4	MW-4	MW-4	MW-5	MW-5	MW-5	MW-5	MW-5	MW-6	MW-6	MW-6	MW-6	MW-6	MW-7	MW-7	MW-7	MW-7	MW-7
Sampling Date	Class GA Standards	4/23/2015	9/13/2016	10/26/2017	9/25/2012	10/17/2013	4/23/2015	9/13/2016	10/27/2017	9/24/2012	10/17/2013	4/23/2015	9/13/2016	10/26/2017	9/25/2012	10/17/2013	4/23/2015	9/13/2016	10/26/2017
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
PCBs																			
Aroclor-1016	**0.09****	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.2 U
Aroclor-1221	**0.09****	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.2 U
Aroclor-1232	**0.09****	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.2 U
Aroclor-1242	**0.09****	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.2 U
Aroclor-1248	**0.09****	**0.56**	**0.15**	**0.89**	0.17 U	0.05 U	0.05 U	**0.26 PJ**	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.2 U
Aroclor-1254	**0.09****	**0.13**	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.2 U
Aroclor-1260	**0.09****	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.19 U	0.17 U	0.05 U	0.05 U	0.05 U	0.2 U
Aroclor-1262	**0.09****	0.05 U	0.05 U	0.19 U	NA	0.05 U	0.05 U	0.05 U	0.19 U	NA	0.05 U	0.05 U	0.05 U	0.19 U	NA	0.05 U	0.05 U	0.05 U	0.2 U
Aroclor-1268	**0.09****	0.05 U	0.05 U	0.19 U	NA	0.05 U	0.05 U	0.05 U	0.19 U	NA	0.05 U	0.05 U	0.05 U	0.19 U	NA	0.05 U	0.05 U	0.05 U	0.2 U

Notes:
- Concentration exceeds NYSDEC Class GA Standard.
U - Compound was not detected at the indicated concentration.
J - Compound detected below the reporting limit or reported concentration is estimated.
P - This flag is used for pesticides/PCB/herbicide compound when there is a greater than 40% difference for detected concentration between the two GC columns used for primary and confirmation analyses. This difference typically indicates interference, causing one value to be unusually high.
* - MW-X is a duplicate sample collected from MW-2R
** - Sum of these compounds can not exceed 0.09 ug/L.
NA - Compound not analyzed

Table 4-3
Summary of Groundwater Sampling Results - PFAS and 1,4-Dioxane
Oswego Casting Site
Site Number 7-38-033

Sample ID **Sampling Date**	**USEPA Health Advisory Limit**	**MW-1** **10/26/2017**	**MW-2** **10/26/2017**	**MW-X*** **10/26/2017**	**MW-3** **10/26/2017**	**MW-4** **10/26/2017**	**MW-5** **10/27/2017**	**MW-6** **10/26/2017**	**MW-7** **10/26/2017**
PFAS (ng/L)									
Perfluorobutanesulfonic acid (PFBS)		2.0 U	**1.42 J**	**1.30 J**	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Perfluorohexanesulfonic acid (PFHxS)		2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Perfluoroheptanoic acid (PFHpA)		2.0 U	**1.65 J**	**1.69 J**	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Perfluorooctanoic acid (PFOA)	70	2.0 U	**3.02**	**2.72**	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Perfluorooctanesulfonic acid (PFOS)	70	2.0 U	**1.96 J**	**1.89 J**	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Perfluorononanoic acid (PFNA)		2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total PFAS		ND	**8.05**	**7.60**	ND	ND	ND	ND	ND
1,4-Dioxane									
1,4-Dioxane (µg/L)	**	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U

Notes:
The current USEPA Public Health Advisory for drinking water is 70 ng/L.
U - Compound was not detected at the indicated concentration.
J - Compound detected below the reporting limit or reported concentration is estimated.
** - No standard currently exists for this compound./
ND - Not Detected.

FIGURES

ARCADIS

Figure 2-1
Site Location
Oswego Castings Site
Oswego, New York
NYSDEC Site 7-38-033

0 2,000 ft

Source: USGS 7.5-minute Series Topographic Quadrangle, Oswego East

0 150 300 600 900 1,200 Feet

N

Legend

- Monitoring Well
- Approximate Site Boundary
- OU-1
- OU-2
- IRM Area (1997 ROD)
- IRM Area (2000 ROD)

Note: Remedial area boundaries are approximate.

New York State Department of Environmental Conservation
Site Number 738033
Oswego Castings, Oswego, New York

SITE MAP

ARCADIS

FIGURE
2-2

G:\GIS\MXD\00266404.0000\SITEMAP.mxd
G:\PROJECT\00266404.0000\PRR\Figure 2-2 - Site Map.pdf

0 100 200 400 600 800 Feet

N

Legend

- Monitoring Well

New York State Department of Environmental Conservation
Site Number 738033
Oswego Castings, Oswego, New York

MONITORING WELL LOCATIONS

ARCADIS

FIGURE
4-1

G:\GIS\MOD\00266404.0000\WELLS.mxd
G:\PROJECT\00266404.0000\Reports\Figure 4-1 Wells.pdf

Legend

- Monitoring Well
- Approximate Site Boundary
- Potentiometric Contour (Feet Above Mean Sea Level)
- 291.33 Groundwater Elevation (Feet Above Mean Sea Level)

0 150 300 600 900 1,200 Feet

N

New York State Department of Environmental Conservation
Site Number 738033
Oswego Castings, Oswego, New York

GROUNDWATER POTENTIOMETRIC MAP
October 2017

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4-2

G:\GISMOD\00266404.0000\POTMAP_Sept2016.mxd

APPENDIX A

O&M Checklist

OSWEGO CASTINGS SITE

Landfill and Concrete Cap Operation and Maintenance Checklist

Inspected by: Jasmine Mullins

Date: 10/26/17 Time: 0900

Weather Conditions: Partly Cloudy @ 50°F

LANDFILL COVER SYSTEM

Erosion	___	YES	✓	NO
Cap Settlement	___	YES	✓	NO
Ponded Water or Wet Areas	___	YES	✓	NO
Burrowing Rodents	___	YES	✓	NO
Brush or Other Woody Vegetation	✓	YES	___	NO

Comments: Thick vegetation/brush along perimeter & wells MW-3, MW-5, MW-6 and MW-7.

CONCRETE COVER

Cracked Concrete	✓	YES	___	NO
Damaged Concrete	___	YES	✓	NO
Concrete Settlement	___	YES	✓	NO
Ponded Water or Wet Areas	___	YES	✓	NO
Presence of Vegetation	✓	YES	✓	NO

Comments: Cracked concrete in center of cover. Vegetation along concrete edges & in SE corner before buildings.

INSPECTOR'S SIGNATURE Jasmine Mullins DATE 10/26/17

APPENDIX B

Site Photographs

Project Photographs

Oswego Castings Site
00266404.0000
Appendix C – Site Photographs

Photo: 1

Date:
October 26, 2017

Description:
Monitoring Well MW-1

Photo: 2

Date:
October 26, 2017

Description:
Metal Pile in closed building behind MW-1

Project Photographs

Oswego Castings Site
00266404.0000
Appendix C – Site Photographs

Photo: 3

Date:
October 26, 2017

Description:
Monitoring Well MW-2R

Photo: 4

Date:
October 26, 2017

Description:
Drums stored between closed buildings

Project Photographs

Oswego Castings Site
00266404.0000
Appendix C – Site Photographs

Photo: 5

Date:
October 26, 2017

Description:
Site facing West

Photo: 6

Date:
October 26, 2017

Description:
Equipment stored on Concrete Cover

Project Photographs

Oswego Castings Site
00266404.0000
Appendix C – Site Photographs

Photo: 7

Date:
October 26, 2017

Description:
Monitoring Well MW-4

Photo: 8

Date:
October 26, 2017

Description:
Site facing East

Project Photographs

Oswego Castings Site
00266404.0000
Appendix C – Site Photographs

Photo: 9

Date:
October 26, 2017

Description:
Site facing East

Photo: 10

Date:
October 26, 2017

Description:
Site facing building and silo

Project Photographs

Oswego Castings Site
00266404.0000
Appendix C – Site Photographs

Photo: 11

Date:
October 26, 2017

Description:
Brush leading to Monitoring Well MW-3

Photo: 12

Date:
October 26, 2017

Description:
Monitoring Well MW-3

Project Photographs

Oswego Castings Site
00266404.0000
Appendix C – Site Photographs

Photo: 13

Date:
October 26, 2017

Description:
Monitoring Well MW-7

Photo: 14

Date:
October 26, 2017

Description:
Site facing Loading Dock Area

Project Photographs

Oswego Castings Site
00266404.0000
Appendix C – Site Photographs

Photo: 15

Date:
October 26, 2017

Description:
Monitoring Well MW-6

Photo: 16

Date:
October 26, 2017

Description:
Collapsed tree on Site Boundary Fence

Project Photographs

Oswego Castings Site
00266404.0000
Appendix C – Site Photographs

Photo: 17

Date:
October 27, 2017

Description:
Monitoring Well MW-5

Photo: 18

Date:
October 27, 2017

Description:
View of Concrete Cover and site facing North

Project Photographs

Oswego Castings Site
00266404.0000
Appendix C – Site Photographs

Photo: 19

Date:
October 27, 2017

Description:
Vegetation in broken concrete section

Photo: 20

Date:
October 27, 2017

Description:
Vegetation growing in corner of Concrete Cover

Project Photographs

Oswego Castings Site
00266404.0000
Appendix C – Site Photographs

Photo: 21

Date:
October 27, 2017

Description:
Debris and vegetation on Concrete Cover

Photo: 22

Date:
October 27, 2017

Description:
Inside view of open building

APPENDIX C

Well Inspection Forms

Groundwater Monitoring Well Inspection

ARCADIS Design & Consultancy for natural and built assets

Site/Project Name: Oswego Castings Project Number: 00266404.0000

Date of Inspection: 10/26/17 Inspector: J. Mullins

Well Designation: MW-2

Well Location: South of main building

Outward Appearance

Flushmount Diameter	____ inches	N/A [X]	
Approximate Stickup Height	~3 feet	N/A [ ]	
Integrity of Protective Casing	Describe: Good, Intact		
Protective Casing Material	Steel [X]	Stainless Steel [ ]	Other ____
Protective Casing Width or Dia.	6 inches		
Weep Hole in Protective Casing	Yes [ ]	No [X]	
Surface Seal/Apron Material	Cement [X]	Bentonite [ ]	Not apparent [ ] Other ____
Integrity of Surface Seal/Apron	Describe: Good		
Surface Drainage	Away from Wellhead [X]	Toward Wellhead [ ]	
Bollards Present?	Yes [ ]	No [X]	Describe: ____
Well ID. Visible?	Yes [X]	No [ ]	Describe: on casing
Lock Present and Functional?	Yes [X]	No [ ]	Describe: ____
Photograph Taken? Photo #	Yes [X]	No [ ]	Describe: ____

Inner Appearance

Integrity of Well Casing	Describe: Good, Intact		
Integrity of Cap Seal	Describe: Good		
Surface Water in Casing?	Yes [ ]	No [X]	Describe: ____
Well Casing Diameter	4 inches		
Well Casing Material	PVC [X]	Steel [ ]	Stainless Steel [ ]
Inner Cap	Threaded [ ]	Slip [ ]	Expansion Plug [X] None [ ]
Reference/Measuring Point	Groove [ ]	Indelible Mark [X]	None [ ]
Evidence of Double Casing?	Yes [ ]	No [X]	Describe: ____

Downhole

Odor	Yes [ ]	No [X]	Describe: ____
PID Reading	0.0 ppm		
Depth to Water (to top of casing)	4.78 feet (nearest 0.01)	Depth to LNAPL	— feet (nearest 0.01) N/A [ ]
Total Well Depth (to top of casing)	17.41 feet (nearest 0.1)		
Sediment (Hard/Soft Bottom)	Describe: ____		

Additional Comments:

No DNAPL detected w/ probe - oil smell was observed and trace amounts of DNAPL were present on probe.

Groundwater Monitoring Well Inspection

ARCADIS Design & Consultancy for natural and built assets

Site/Project Name: Oswego Castings Project Number: 00266404.0000

Date of Inspection: 10/24/17 Inspector: J. Mullins

Well Designation: MW-2R

Well Location: South of Main Building

Outward Appearance

Flushmount Diameter	____ inches	N/A [✓]	
Approximate Stickup Height	~2 feet	N/A [ ]	
Integrity of Protective Casing	Describe: Good; intact		
Protective Casing Material	Steel [✓]	Stainless Steel [ ]	Other ____
Protective Casing Width or Dia.	4 inches		
Weep Hole in Protective Casing	Yes [ ]	No [✓]	
Surface Seal/Apron Material	Cement [✓]	Bentonite [ ]	Not apparent [ ] Other ____
Integrity of Surface Seal/Apron	Describe: FAIR		
Surface Drainage	Away from Wellhead [✓]	Toward Wellhead [ ]	
Bollards Present?	Yes [ ]	No [✓] Describe:	
Well ID. Visible?	Yes [✓]	No [ ] Describe:	
Lock Present and Functional?	Yes [✓]	No [ ] Describe:	
Photograph Taken? Photo #	Yes [✓]	No [ ] Describe:	

Inner Appearance

Integrity of Well Casing	Describe: Good; intact		
Integrity of Cap Seal	Describe: Good		
Surface Water in Casing?	Yes [ ]	No [✓] Describe:	
Well Casing Diameter	2 inches		
Well Casing Material	PVC [✓]	Steel [ ]	Stainless Steel [ ]
Inner Cap	Threaded [ ]	Slip [ ]	Expansion Plug [✓] None [ ]
Reference/Measuring Point	Groove [ ]	Indelible Mark [✓]	None [ ]
Evidence of Double Casing?	Yes [ ]	No [✓] Describe:	

Downhole

Odor	Yes [ ]	No [✓] Describe:	
PID Reading	00 ppm		
Depth to Water (to top of casing)	3.73 feet (nearest 0.01)	Depth to LNAPL	— feet (nearest 0.01) N/A [✓]
Total Well Depth (to top of casing)	15.77 feet (nearest 0.1)		
Sediment (Hard/Soft Bottom)	Describe: FIRM Bottom		

Additional Comments:

Groundwater Monitoring Well Inspection

ARCADIS Design & Consultancy for natural and built assets

Site/Project Name: Oswego Castings Project Number: 00266404.0000

Date of Inspection: MW-3 Inspector: J. Mullins

Well Designation: 10/26/17

Well Location: East Side of Site

Outward Appearance

Flushmount Diameter	_____ inches	N/A [X]		
Approximate Stickup Height	~2 feet	N/A [ ]		
Integrity of Protective Casing	Describe: Good, Intact			
Protective Casing Material	Steel [X]	Stainless Steel [ ]	Other _____	
Protective Casing Width or Dia.	6 inches			
Weep Hole in Protective Casing	Yes [ ]	No [X]		
Surface Seal/Apron Material	Cement [X]	Bentonite [ ]	Not apparent [ ]	Other _____
Integrity of Surface Seal/Apron	Describe: Good			
Surface Drainage	Away from Wellhead [X]	Toward Wellhead [ ]		
Bollards Present?	Yes [ ]	No [X]	Describe:	
Well ID. Visible?	Yes [X]	No [ ]	Describe: On Casing	
Lock Present and Functional?	Yes [X]	No [ ]	Describe:	
Photograph Taken? Photo #	Yes [X]	No [ ]	Describe:	

Inner Appearance

Integrity of Well Casing	Describe: Good, Intact			
Integrity of Cap Seal	Describe: good			
Surface Water in Casing?	Yes [X]	No [ ]	Describe:	
Well Casing Diameter	4 inches			
Well Casing Material	PVC [X]	Steel [ ]	Stainless Steel [ ]	
Inner Cap	Threaded [ ]	Slip [ ]	Expansion Plug [X]	None [ ]
Reference/Measuring Point	Groove [ ]	Indelible Mark [X]	None [ ]	
Evidence of Double Casing?	Yes [ ]	No [X]	Describe:	

Downhole

Odor	Yes [ ]	No [X]	Describe:	
PID Reading	0.0 ppm			
Depth to Water (to top of casing)	3.00 feet (nearest 0.01)	Depth to LNAPL	— feet (nearest 0.01)	N/A [X]
Total Well Depth (to top of casing)	17.31 feet (nearest 0.1)			
Sediment (Hard/Soft Bottom)	Describe: _____			

Additional Comments:

Groundwater Monitoring Well Inspection

ARCADIS Design & Consultancy for natural and built assets

Site/Project Name: Oswego Castings Project Number: 00266404.0000

Date of Inspection: 10/26/17 Inspector: J. Mullins

Well Designation: MW-4

Well Location: Central Area of Site

Outward Appearance

Flushmount Diameter	____ inches	N/A [X]	
Approximate Stickup Height	~2 feet	N/A [ ]	
Integrity of Protective Casing	Describe: Good, Intact		
Protective Casing Material	Steel [X]	Stainless Steel [ ]	Other ____
Protective Casing Width or Dia.	6 inches		
Weep Hole in Protective Casing	Yes [ ]	No [X]	
Surface Seal/Apron Material	Cement [X]	Bentonite [ ]	Not apparent [ ] Other ____
Integrity of Surface Seal/Apron	Describe: Good		
Surface Drainage	Away from Wellhead [ ]	Toward Wellhead [ ]	
Bollards Present?	Yes [X]	No [ ]	Describe: ____
Well ID. Visible?	Yes [X]	No [ ]	Describe: on casing
Lock Present and Functional?	Yes [X]	No [ ]	Describe: ____
Photograph Taken? Photo #	Yes [X]	No [ ]	Describe: ____

Inner Appearance

Integrity of Well Casing	Describe: Good, Intact		
Integrity of Cap Seal	Describe: good		
Surface Water in Casing?	Yes [ ]	No [X]	Describe: ____
Well Casing Diameter	4 inches		
Well Casing Material	PVC [X]	Steel [ ]	Stainless Steel [ ]
Inner Cap	Threaded [ ]	Slip [ ]	Expansion Plug [X] None [ ]
Reference/Measuring Point	Groove [ ]	Indelible Mark [X]	None [ ]
Evidence of Double Casing?	Yes [ ]	No [X]	Describe: ____

Downhole

Odor	Yes [ ]	No [X]	Describe: ____
PID Reading	0.0 ppm		
Depth to Water (to top of casing)	3.72 feet (nearest 0.01)	Depth to LNAPL	____ feet (nearest 0.01) N/A [✓]
Total Well Depth (to top of casing)	16.42 feet (nearest 0.1)		
Sediment (Hard/Soft Bottom)	Describe: Soft bottom		

Additional Comments:

Groundwater Monitoring Well Inspection

ARCADIS Design & Consultancy for natural and built assets

Site/Project Name: Oswego Castings Project Number: 00266404.0000

Date of Inspection: 10/27/17 Inspector: J. Mullins

Well Designation: MW-5

Well Location: NW side of site; behind concrete block

Outward Appearance

Flushmount Diameter	____ inches	N/A [✓]	
Approximate Stickup Height	≈3.5 feet	N/A [ ]	
Integrity of Protective Casing	Describe: Good; intact		
Protective Casing Material	Steel [✓]	Stainless Steel [ ]	Other ____
Protective Casing Width or Dia.	4 inches		
Weep Hole in Protective Casing	Yes [ ]	No [✓]	
Surface Seal/Apron Material	Cement [✓]	Bentonite [ ]	Not apparent [ ] Other ____
Integrity of Surface Seal/Apron	Describe: Slightly Fair; loose section of surface cement		
Surface Drainage	Away from Wellhead [✓]	Toward Wellhead [ ]	
Bollards Present?	Yes [ ]	No [✓]	Describe: Concrete block ≈5 ft. ahead of well
Well ID. Visible?	Yes [✓]	No [ ]	Describe: ____
Lock Present and Functional?	Yes [✓]	No [ ]	Describe: ____
Photograph Taken? Photo #	Yes [✓]	No [ ]	Describe: ____

Inner Appearance

Integrity of Well Casing	Describe: Good; intact		
Integrity of Cap Seal	Describe: Good		
Surface Water in Casing?	Yes [ ]	No [✓]	Describe: ____
Well Casing Diameter	2 inches		
Well Casing Material	PVC [✓]	Steel [ ]	Stainless Steel [ ]
Inner Cap	Threaded [ ]	Slip [ ]	Expansion Plug [✓] None [ ]
Reference/Measuring Point	Groove [ ]	Indelible Mark [✓]	None [ ]
Evidence of Double Casing?	Yes [ ]	No [✓]	Describe: ____

Downhole

Odor	Yes [ ]	No [✓]	Describe: ____
PID Reading	0.0 ppm		
Depth to Water (to top of casing)	6.46 feet (nearest 0.01)	Depth to LNAPL	— feet (nearest 0.01) N/A [✓]
Total Well Depth (to top of casing)	16.88 feet (nearest 0.1)		
Sediment (Hard/Soft Bottom)	Describe: HARD BOTTOM		

Additional Comments:

Groundwater Monitoring Well Inspection

ARCADIS Design & Consultancy for natural and built assets

Site/Project Name: Oswego Castings Project Number: 00266404.0000

Date of Inspection: 10/26/17 Inspector: J. Mullins

Well Designation: MW-6

Well Location: East side of site

Outward Appearance

Flushmount Diameter	____ inches	N/A [X]	
Approximate Stickup Height	~2 feet	N/A [ ]	
Integrity of Protective Casing	Describe: Good. Intact		
Protective Casing Material	Steel [X]	Stainless Steel [ ]	Other ____
Protective Casing Width or Dia.	4 inches		
Weep Hole in Protective Casing	Yes [ ]	No [X]	
Surface Seal/Apron Material	Cement [X]	Bentonite [ ]	Not apparent [ ] Other ____
Integrity of Surface Seal/Apron	Describe: Good		
Surface Drainage	Away from Wellhead [ ]	Toward Wellhead [ ]	
Bollards Present?	Yes [ ]	No [X]	Describe: ____
Well ID. Visible?	Yes [X]	No [ ]	Describe: on casing
Lock Present and Functional?	Yes [X]	No [ ]	Describe: ____
Photograph Taken? Photo #	Yes [X]	No [ ]	Describe: ____

Inner Appearance

Integrity of Well Casing	Describe: Good, Intact		
Integrity of Cap Seal	Describe: Good		
Surface Water in Casing?	Yes [ ]	No [X]	Describe: ____
Well Casing Diameter	2 inches		
Well Casing Material	PVC [X]	Steel [ ]	Stainless Steel [ ]
Inner Cap	Threaded [ ]	Slip [ ]	Expansion Plug [X] None [ ]
Reference/Measuring Point	Groove [ ]	Indelible Mark [X]	None [ ]
Evidence of Double Casing?	Yes [ ]	No [X]	Describe: ____

Downhole

Odor	Yes [ ]	No [X]	Describe: ____
PID Reading	0.0 ppm		
Depth to Water (to top of casing)	16.98 feet (nearest 0.01)	Depth to LNAPL	— feet (nearest 0.01) N/A [X]
Total Well Depth (to top of casing)	36.77 feet (nearest 0.1)		
Sediment (Hard/Soft Bottom)	Describe: ____		

Additional Comments:

Groundwater Monitoring Well Inspection

ARCADIS Design & Consultancy for natural and built assets

Site/Project Name: Oswego Castings Project Number: 00266404.0000

Date of Inspection: 10/26/17 Inspector: J. Mullins

Well Designation: MW-7

Well Location: North side of site

Outward Appearance

Flushmount Diameter	____ inches	N/A [✓]	
Approximate Stickup Height	≈ 3 feet	N/A [ ]	
Integrity of Protective Casing	Describe: Good; intact		
Protective Casing Material	Steel [✓]	Stainless Steel [ ]	Other ____
Protective Casing Width or Dia.	4 inches		
Weep Hole in Protective Casing	Yes [ ]	No [✓]	
Surface Seal/Apron Material	Cement [✓]	Bentonite [ ]	Not apparent [ ] Other ____
Integrity of Surface Seal/Apron	Describe: Good		
Surface Drainage	Away from Wellhead [ ]	Toward Wellhead [✓]	
Bollards Present?	Yes [ ]	No [✓]	Describe:
Well ID. Visible?	Yes [✓]	No [ ]	Describe: On Casing
Lock Present and Functional?	Yes [✓]	No [ ]	Describe:
Photograph Taken? Photo #	Yes [✓]	No [ ]	Describe:

Inner Appearance

Integrity of Well Casing	Describe: Good; intact		
Integrity of Cap Seal	Describe: Good		
Surface Water in Casing?	Yes [ ]	No [✓]	Describe:
Well Casing Diameter	2 inches		
Well Casing Material	PVC [✓]	Steel [ ]	Stainless Steel [ ]
Inner Cap	Threaded [ ]	Slip [ ]	Expansion Plug [✓] None [ ]
Reference/Measuring Point	Groove [ ]	Indelible Mark [✓]	None [ ]
Evidence of Double Casing?	Yes [ ]	No [✓]	Describe:

Downhole

Odor	Yes [ ]	No [✓]	Describe:
PID Reading	0.0 ppm		
Depth to Water (to top of casing)	5.58 feet (nearest 0.01)	Depth to LNAPL	— feet (nearest 0.01) N/A [✓]
Total Well Depth (to top of casing)	16.09 feet (nearest 0.1)		
Sediment (Hard/Soft Bottom)	Describe: HARD Bottom		

Additional Comments:

APPENDIX D

Groundwater Level Data Form

GROUNDWATER LEVEL DATA FORM

PROJECT NAME: Oswego Castings
PROJECT NUMBER: 00266404.0000

DATE: 10/26/2017 - 10/27/2017
PERSONNEL: J. Mullins
K. Liloia (Precision)

WELL ID	Date	Time	Headspace VOCs (ppm)	Depth to Water (feet)	Total Depth (feet)	Reference Point
MW-1	10/26/2017	09:30 - 05:30	0.0	4.78	17.41	TOC
MW-2R	10/26/2017	09:30 - 05:30	0.0	3.73	15.77	TOC
MW-3	10/26/2017	09:30 - 05:30	0.0	3.00	17.31	TOC
MW-4	10/26/2017	09:30 - 05:30	0.0	3.72	16.42	TOC
MW-5	10/27/2017	08:45 - 09:40	0.0	6.46	16.88	TOC
MW-6	10/26/2017	09:30 - 05:30	0.0	10.98	36.77	TOC
MW-7	10/26/2017	09:30 - 05:30	0.0	5.58	16.09	TOC

Notes:

APPENDIX E

Groundwater Sampling Purge Logs

LOW FLOW SAMPLING PURGE LOG

WELL NUMBER: MW-1 DATE: 10/26/2017

PROJECT NAME: Oswego Castings
PROJECT NUMBER: 00266404.0000
SAMPLERS: JM/KL

A: Total Casing and Screen Length: 17.41'

B: Casing Internal Diameter: 2"

C: Water Level Below Top of Casing: 4.78'

PARAMETER	ACCUMULATED VOLUME PURGED											
Time	0940	0945	0950	0955	1000	1005	1010					
Depth to Water (ft)	4.78	5.37	5.59	6.36	6.68	7.25	7.55					
Gallons	0.00	0.25	0.40	1.00	1.20	1.60	1.75					
pH	6.57	6.92	6.96	7.02	7.05	7.05	7.06					
Conductivity (mS/cm)	0.803	0.798	0.797	0.796	0.792	0.790	0.788					
Turbidity (ntu)	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
Dissolved Oxygen (mg/l)	3.31	2.38	2.18	1.83	1.68	1.66	1.60					
Temperature (^{o}C)	14.72	14.80	14.81	14.87	14.89	14.90	14.95					
Redox (mV)	-40	-111	-120	-134	-142	-143	-144					

Notes: Collected sample and MS/MSD at 1020.

LOW FLOW SAMPLING PURGE LOG

WELL NUMBER: MW-2R DATE: 10/26/2017

PROJECT NAME: Oswego Castings
PROJECT NUMBER: 00266404.0000
SAMPLERS: JM/KL

A: Total Casing and Screen Length: 15.77'

B: Casing Internal Diameter: 2"

C: Water Level Below Top of Casing: 3.73'

PARAMETER	ACCUMULATED VOLUME PURGED											
Time	0955	1000	1005	1010	1015	1020	1025	1030	1035			
Depth to Water (ft)	3.73	4.23	4.73	5.23	5.73	6.23	6.73	7.23	7.73			
Gallons	0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6			
pH	6.28	7.08	7.27	7.31	7.44	7.49	7.55	7.58	7.57			
Conductivity (mS/cm)	0.899	0.863	0.850	0.848	0.840	0.836	0.833	0.834	0.833			
Turbidity (ntu)	81.2	83.0	88.0	67.2	68.8	70.3	75.2	80.8	80.1			
Dissolved Oxygen (mg/l)	1.67	1.38	0.83	0.51	0.45	0.56	0.57	0.57	0.57			
Temperature (^{o}C)	14.25	14.88	14.50	14.44	14.57	14.72	14.74	14.74	14.73			
Redox (mV)	182	130	122	117	113	110	105	103	101			

Notes: Collected sample and MW-X-DUP at 1040.

LOW FLOW SAMPLING PURGE LOG

WELL NUMBER: **MW-3** DATE: 10/26/2017

PROJECT NAME: Oswego Castings
PROJECT NUMBER: 00266404.0000
SAMPLERS: JM/KL

A: Total Casing and Screen Length: 17.31'

B: Casing Internal Diameter: 2"

C: Water Level Below Top of Casing: 3.00'

PARAMETER	ACCUMULATED VOLUME PURGED											
Time	1320	1325	1330	1335	1340	1345	1350					
Depth to Water (ft)	3.00	3.53	4.07	4.60	5.12	5.66	6.21					
Gallons	0.00	0.25	0.75	1.00	1.25	1.50	1.75					
pH	7.37	7.30	7.21	7.21	7.20	7.20	7.20					
Conductivity (mS/cm)	0.775	0.644	0.611	0.614	0.614	0.616	0.618					
Turbidity (ntu)	17.3	16.8	13.4	12.3	12.0	11.8	12.5					
Dissolved Oxygen (mg/l)	3.57	2.01	1.40	1.32	1.34	1.43	1.39					
Temperature (^{o}C)	15.75	15.80	15.25	15.08	15.05	14.82	14.65					
Redox (mV)	-24	-159	-169	-167	-165	-164	-163					

Notes: Collected sample at 1410.

LOW FLOW SAMPLING PURGE LOG

WELL NUMBER: MW-4 DATE: 10/26/2017

PROJECT NAME: Oswego Castings
PROJECT NUMBER: 00266404.0000
SAMPLERS: JM/KL

A: Total Casing and Screen Length: 16.42'

B: Casing Internal Diameter: 4"

C: Water Level Below Top of Casing: 3.72'

PARAMETER	ACCUMULATED VOLUME PURGED											
Time	1155	1200	1205	1210	1215	1220	1225					
Depth to Water (ft)	3.72	3.92	4.11	4.30	4.49	4.69	4.89					
Gallons	0.00	0.25	0.75	1.00	1.25	1.75	2.00					
pH	7.14	7.36	7.37	7.38	7.37	7.37	7.37					
Conductivity (mS/cm)	0.808	0.846	0.847	0.847	0.845	0.841	0.839					
Turbidity (ntu)	0.1	0.0	0.0	0.0	0.0	0.0	0.0					
Dissolved Oxygen (mg/l)	2.10	3.99	4.07	4.26	4.24	4.15	4.02					
Temperature (^{o}C)	15.12	15.32	15.38	15.42	15.45	15.40	15.55					
Redox (mV)	-88	38	37	37	38	40	40					

Notes: Collected sample at 1240.

LOW FLOW SAMPLING PURGE LOG

WELL NUMBER: **MW-5** DATE: 10/27/2017

PROJECT NAME: Oswego Castings
PROJECT NUMBER: 00266404.0000
SAMPLERS: JM/KL

A: Total Casing and Screen Length: 16.88'

B: Casing Internal Diameter: 2"

C: Water Level Below Top of Casing: 6.46'

PARAMETER	ACCUMULATED VOLUME PURGED											
Time	0850	0855	0900	0905	0910	0915	0920					
Depth to Water (ft)	6.46	6.87	7.29	7.65	7.86	8.25	8.49					
Gallons	0.0	0.2	0.4	0.6	0.8	1.0	1.2					
pH	7.12	6.97	6.93	6.89	6.87	6.88	6.88					
Conductivity (mS/cm)	1.16	1.15	1.14	1.13	1.13	1.13	1.12					
Turbidity (ntu)	39.3	18.5	12.4	11.2	10.6	10.4	10.0					
Dissolved Oxygen (mg/l)	3.88	1.04	0.72	0.52	0.47	0.45	0.40					
Temperature (^{o}C)	9.30	10.78	11.27	11.67	12.01	12.09	12.03					
Redox (mV)	-75	-77	-66	-50	-35	-22	-10					

Notes: Collected sample at 0925.

LOW FLOW SAMPLING PURGE LOG

WELL NUMBER: **MW-6** DATE: 10/26/2017

PROJECT NAME: Oswego Castings
PROJECT NUMBER: 00266404.0000
SAMPLERS: JM/KL

A: Total Casing and Screen Length: 36.77'

B: Casing Internal Diameter: 2"

C: Water Level Below Top of Casing: 10.98'

PARAMETER	ACCUMULATED VOLUME PURGED											
Time	1440	1445	1450	1455	1500	1505	1510					
Depth to Water (ft)	10.98	12.50	13.98	15.48	16.98	18.48	20.02					
Gallons	0.0	0.4	0.6	1.0	1.2	1.3	1.5					
pH	7.37	7.63	7.66	7.67	7.68	7.68	7.67					
Conductivity (mS/cm)	0.657	0.709	0.706	0.70	0.689	0.691	0.692					
Turbidity (ntu)	6.78	2.91	3.19	0.00	0.00	0.00	0.00					
Dissolved Oxygen (mg/l)	2.20	2.27	1.60	1.79	1.86	1.84	1.80					
Temperature (^{o}C)	14.56	14.4	14.38	14.47	14.15	14.11	14.35					
Redox (mV)	-89	-30	-49	-51	-50	-54	-58					

Notes: Collected sample at 1515.

LOW FLOW SAMPLING PURGE LOG

WELL NUMBER: MW-7 DATE: 10/26/2017

PROJECT NAME: Oswego Castings
PROJECT NUMBER: 00266404.0000
SAMPLERS: JM/KL

A: Total Casing and Screen Length: 16.09'

B: Casing Internal Diameter: 2"

C: Water Level Below Top of Casing: 5.58'

PARAMETER	ACCUMULATED VOLUME PURGED											
Time	1640	1645	1650	1655	1700	1705	1710					
Depth to Water (ft)	5.58	6.11	6.64	7.16	7.7	8.22	8.75					
Gallons	0.0	0.2	0.4	0.6	0.8	1.0	1.2					
pH	6.85	6.85	6.95	6.96	6.96	6.95	6.96					
Conductivity (mS/cm)	2.46	2.41	2.19	2.01	1.94	2.02	2.03					
Turbidity (ntu)	11.30	9.76	9.70	4.85	2.73	2.78	2.79					
Dissolved Oxygen (mg/l)	0.81	0.65	0.67	0.67	0.67	0.69	0.67					
Temperature (^{o}C)	18.17	17.39	16.84	16.28	16.22	16.03	16.01					
Redox (mV)	-192	-195	-192	-170	-148	-141	-140					

Notes: Collected sample at 1715.

APPENDIX F

Analytical Data Packages

eurofins | Spectrum Analytical

☑ Final Report
☐ Revised Report

Report Date:
08-Nov-17 12:06

Laboratory Report
SC40914

ARCADIS
855 Route 146
Suite 210
Clifton Park, NY 12065

Project: Oswego Castings
Project #: 00266404.0000

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87936
Maine # MA138
New Hampshire # 2972/2538
New Jersey # MA011
New York # 11393
Pennsylvania # 68-04426/68-02924
Rhode Island # LAO00348
USDA # P330-15-00375
Vermont # VT-11393

Authorized by:

Kimberly Laplante
Quality Assurance Manager

Eurofins Spectrum Analytical holds primary NELAC certification in the State of New York for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of New York does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.
Please note that this report contains 17 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Eurofins Spectrum Analytical, Inc.

Eurofins Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Eurofins Spectrum Analytical, Inc. is currently accredited for the specific method or analyte indicated. Please refer to our 'Quality' web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Eurofins Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey, Pennsylvania and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (PA-68-04426).

Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.

ARCADIS

Figure 2-1
Site Location
Oswego Castings Site
Oswego, New York
NYSDEC Site 7-38-033

0 2,000 ft

Source: USGS 7.5-minute Series Topographic Quadrangle, Oswego East

Sample Summary

Work Order: SC40914

Project: Oswego Castings

Project Number: 00266404.0000

Laboratory ID	Client Sample ID	Matrix	Date Sampled	Date Received
SC40914-01	MW-1	Ground Water	26-Oct-17 10:20	27-Oct-17 11:55
SC40914-02	MW-2R	Ground Water	26-Oct-17 10:40	27-Oct-17 11:55
SC40914-03	MW-X-Dup	Ground Water	26-Oct-17 00:00	27-Oct-17 11:55
SC40914-04	MW-4	Ground Water	26-Oct-17 12:40	27-Oct-17 11:55
SC40914-05	MW-3	Ground Water	26-Oct-17 14:10	27-Oct-17 11:55
SC40914-06	MW-6	Ground Water	26-Oct-17 15:15	27-Oct-17 11:55
SC40914-07	MW-7	Ground Water	26-Oct-17 17:15	27-Oct-17 11:55
SC40914-08	MW-5	Ground Water	27-Oct-17 09:25	27-Oct-17 11:55
SC40914-09	FB-X	Ground Water	27-Oct-17 09:00	27-Oct-17 11:55

CASE NARRATIVE:

Data has been reported to the RDL. This report includes estimated concentrations detected below the RDL and above the MDL (J-Flag).

All non-detects and all results below the detection limit are reported as "<" (less than) the detection limit in this report.

The samples were received 4.8 degrees Celsius, please refer to the Chain of Custody for details specific to temperature upon receipt. An infrared thermometer with a tolerance of +/- 1.0 degrees Celsius was used immediately upon receipt of the samples.

If a Matrix Spike (MS), Matrix Spike Duplicate (MSD) or Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group. If method or program required MS/MSD/Dup were not performed, sufficient sample was not provided to the laboratory.

See below for any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.

SW846 8082A

Spikes:

1718531-MS1 *Source: SC40914-01*

The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.

Aroclor-1016
Aroclor-1016 [2C]

1718531-MSD1 *Source: SC40914-01*

The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.

Aroclor-1016
Aroclor-1016 [2C]

Sample Acceptance Check Form

Client:	ARCADIS - Clifton Park, NY
Project:	Oswego Castings / 00266404.0000
Work Order:	SC40914
Sample(s) received on:	10/27/2017

The following outlines the condition of samples for the attached Chain of Custody upon receipt.

	Yes	No	N/A
Were custody seals present?	☐	☑	☐
Were custody seals intact?	☐	☐	☑
Were samples received at a temperature of ≤ 6°C?	☑	☐	☐
Were samples cooled on ice upon transfer to laboratory representative?	☑	☐	☐
Were sample containers received intact?	☑	☐	☐
Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)?	☑	☐	☐
Were samples accompanied by a Chain of Custody document?	☑	☐	☐
Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample?	☑	☐	☐
Did sample container labels agree with Chain of Custody document?	☑	☐	☐
Were samples received within method-specific holding times?	☑	☐	☐

Summary of Hits

Lab ID: SC40914-01 **Client ID:** MW-1

Parameter	Result	Flag	Reporting Limit	Units	Analytical Method
Aroclor-1248 [2C]	28.6		0.202	µg/l	SW846 8082A
Aroclor-1260 [2C]	1.40		0.202	µg/l	SW846 8082A

Lab ID: SC40914-04 **Client ID:** MW-4

Parameter	Result	Flag	Reporting Limit	Units	Analytical Method
Aroclor-1248	0.890		0.196	µg/l	SW846 8082A

Lab ID: SC40914-05 **Client ID:** MW-3

Parameter	Result	Flag	Reporting Limit	Units	Analytical Method
Aroclor-1248	0.643		0.204	µg/l	SW846 8082A

Please note that because there are no reporting limits associated with hazardous waste characterizations or micro analyses, this summary does not include hits from these analyses if included in this work order.

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
MW-1 SC40914-01	00266404.0000	Ground Water	26-Oct-17 10:20	27-Oct-17

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls Prepared by method SW846 3510C													
12674-11-2	Aroclor-1016	< 0.202	U	µg/l	0.202	0.105	1	SW846 8082A	02-Nov-17	06-Nov-17	IMR	1718531	X
11104-28-2	Aroclor-1221	< 0.202	U	µg/l	0.202	0.116	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 0.202	U	µg/l	0.202	0.112	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 0.202	U	µg/l	0.202	0.108	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248 [2C]	**28.6**		µg/l	0.202	0.126	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 0.202	U	µg/l	0.202	0.117	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260 [2C]	**1.40**		µg/l	0.202	0.116	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 0.202	U	µg/l	0.202	0.0905	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 0.202	U	µg/l	0.202	0.0924	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*60*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*60*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*55*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*65*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
MW-2R	00266404.0000	Ground Water	26-Oct-17 10:40	27-Oct-17
SC40914-02				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls Prepared by method SW846 3510C													
12674-11-2	Aroclor-1016	< 0.198	U	µg/l	0.198	0.103	1	SW846 8082A	02-Nov-17	06-Nov-17	IMR	1718531	X
11104-28-2	Aroclor-1221	< 0.198	U	µg/l	0.198	0.114	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 0.198	U	µg/l	0.198	0.110	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 0.198	U	µg/l	0.198	0.106	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 0.198	U	µg/l	0.198	0.135	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 0.198	U	µg/l	0.198	0.115	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 0.198	U	µg/l	0.198	0.0843	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 0.198	U	µg/l	0.198	0.0887	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 0.198	U	µg/l	0.198	0.0906	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*60*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*60*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*75*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*80*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
MW-X-Dup	00266404.0000	Ground Water	26-Oct-17 00:00	27-Oct-17
SC40914-03				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls Prepared by method SW846 3510C													
12674-11-2	Aroclor-1016	< 0.196	U	µg/l	0.196	0.102	1	SW846 8082A	02-Nov-17	06-Nov-17	IMR	1718531	X
11104-28-2	Aroclor-1221	< 0.196	U	µg/l	0.196	0.113	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 0.196	U	µg/l	0.196	0.109	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 0.196	U	µg/l	0.196	0.105	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 0.196	U	µg/l	0.196	0.133	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 0.196	U	µg/l	0.196	0.114	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 0.196	U	µg/l	0.196	0.0834	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 0.196	U	µg/l	0.196	0.0878	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 0.196	U	µg/l	0.196	0.0897	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*70*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*70*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*70*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*85*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
MW-4	00266404.0000	Ground Water	26-Oct-17 12:40	27-Oct-17
SC40914-04				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls Prepared by method SW846 3510C													
12674-11-2	Aroclor-1016	< 0.196	U	µg/l	0.196	0.102	1	SW846 8082A	02-Nov-17	06-Nov-17	IMR	1718531	X
11104-28-2	Aroclor-1221	< 0.196	U	µg/l	0.196	0.113	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 0.196	U	µg/l	0.196	0.109	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 0.196	U	µg/l	0.196	0.105	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	**0.890**		µg/l	0.196	0.133	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 0.196	U	µg/l	0.196	0.114	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 0.196	U	µg/l	0.196	0.0834	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 0.196	U	µg/l	0.196	0.0878	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 0.196	U	µg/l	0.196	0.0897	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*45*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*55*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*75*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*75*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
MW-3 SC40914-05	00266404.0000	Ground Water	26-Oct-17 14:10	27-Oct-17

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls Prepared by method SW846 3510C													
12674-11-2	Aroclor-1016	< 0.204	U	µg/l	0.204	0.106	1	SW846 8082A	02-Nov-17	06-Nov-17	IMR	1718531	X
11104-28-2	Aroclor-1221	< 0.204	U	µg/l	0.204	0.117	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 0.204	U	µg/l	0.204	0.113	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 0.204	U	µg/l	0.204	0.109	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	**0.643**		µg/l	0.204	0.139	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 0.204	U	µg/l	0.204	0.118	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 0.204	U	µg/l	0.204	0.0868	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 0.204	U	µg/l	0.204	0.0914	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 0.204	U	µg/l	0.204	0.0934	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*60*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*65*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*70*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*90*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
MW-6 SC40914-06	00266404.0000	Ground Water	26-Oct-17 15:15	27-Oct-17

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls Prepared by method SW846 3510C													
12674-11-2	Aroclor-1016	< 0.196	U	µg/l	0.196	0.102	1	SW846 8082A	02-Nov-17	06-Nov-17	IMR	1718531	X
11104-28-2	Aroclor-1221	< 0.196	U	µg/l	0.196	0.113	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 0.196	U	µg/l	0.196	0.109	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 0.196	U	µg/l	0.196	0.105	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 0.196	U	µg/l	0.196	0.133	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 0.196	U	µg/l	0.196	0.114	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 0.196	U	µg/l	0.196	0.0834	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 0.196	U	µg/l	0.196	0.0878	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 0.196	U	µg/l	0.196	0.0897	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*60*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*65*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*75*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*85*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
MW-7 SC40914-07	00266404.0000	Ground Water	26-Oct-17 17:15	27-Oct-17

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls Prepared by method SW846 3510C													
12674-11-2	Aroclor-1016	< 0.202	U	µg/l	0.202	0.105	1	SW846 8082A	02-Nov-17	06-Nov-17	IMR	1718531	X
11104-28-2	Aroclor-1221	< 0.202	U	µg/l	0.202	0.116	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 0.202	U	µg/l	0.202	0.112	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 0.202	U	µg/l	0.202	0.108	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 0.202	U	µg/l	0.202	0.137	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 0.202	U	µg/l	0.202	0.117	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 0.202	U	µg/l	0.202	0.0860	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 0.202	U	µg/l	0.202	0.0905	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 0.202	U	µg/l	0.202	0.0924	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*35*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*45*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*50*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*45*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
MW-5 SC40914-08	00266404.0000	Ground Water	27-Oct-17 09:25	27-Oct-17

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls Prepared by method SW846 3510C													
12674-11-2	Aroclor-1016	< 0.198	U	µg/l	0.198	0.103	1	SW846 8082A	02-Nov-17	06-Nov-17	IMR	1718531	X
11104-28-2	Aroclor-1221	< 0.198	U	µg/l	0.198	0.114	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 0.198	U	µg/l	0.198	0.110	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 0.198	U	µg/l	0.198	0.106	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 0.198	U	µg/l	0.198	0.135	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 0.198	U	µg/l	0.198	0.115	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 0.198	U	µg/l	0.198	0.0843	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 0.198	U	µg/l	0.198	0.0887	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 0.198	U	µg/l	0.198	0.0906	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*45*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*55*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*55*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*70*			*30-150 %*			"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
FB-X	00266404.0000	Ground Water	27-Oct-17 09:00	27-Oct-17
SC40914-09				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Semivolatile Organic Compounds by GC													
Polychlorinated Biphenyls Prepared by method SW846 3510C													
12674-11-2	Aroclor-1016	< 0.196	U	µg/l	0.196	0.102	1	SW846 8082A	02-Nov-17	06-Nov-17	IMR	1718531	X
11104-28-2	Aroclor-1221	< 0.196	U	µg/l	0.196	0.113	1	"	"	"	"	"	X
11141-16-5	Aroclor-1232	< 0.196	U	µg/l	0.196	0.109	1	"	"	"	"	"	X
53469-21-9	Aroclor-1242	< 0.196	U	µg/l	0.196	0.105	1	"	"	"	"	"	X
12672-29-6	Aroclor-1248	< 0.196	U	µg/l	0.196	0.133	1	"	"	"	"	"	X
11097-69-1	Aroclor-1254	< 0.196	U	µg/l	0.196	0.114	1	"	"	"	"	"	X
11096-82-5	Aroclor-1260	< 0.196	U	µg/l	0.196	0.0834	1	"	"	"	"	"	X
37324-23-5	Aroclor-1262	< 0.196	U	µg/l	0.196	0.0878	1	"	"	"	"	"	X
11100-14-4	Aroclor-1268	< 0.196	U	µg/l	0.196	0.0897	1	"	"	"	"	"	X
Surrogate recoveries:													
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr)*	*45*			*30-150 %*			"	"	"	"	"	
10386-84-2	*4,4-DB-Octafluorobiphenyl (Sr) [2C]*	*50*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr)*	*60*			*30-150 %*			"	"	"	"	"	
2051-24-3	*Decachlorobiphenyl (Sr) [2C]*	*65*			*30-150 %*			"	"	"	"	"	

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8082A										
Batch 1718531 - SW846 3510C										
Blank (1718531-BLK1)						Prepared: 02-Nov-17 Analyzed: 06-Nov-17				
Aroclor-1016	< 0.202	U	µg/l	0.202						
Aroclor-1016 [2C]	< 0.202	U	µg/l	0.202						
Aroclor-1221	< 0.202	U	µg/l	0.202						
Aroclor-1221 [2C]	< 0.202	U	µg/l	0.202						
Aroclor-1232	< 0.202	U	µg/l	0.202						
Aroclor-1232 [2C]	< 0.202	U	µg/l	0.202						
Aroclor-1242	< 0.202	U	µg/l	0.202						
Aroclor-1242 [2C]	< 0.202	U	µg/l	0.202						
Aroclor-1248	< 0.202	U	µg/l	0.202						
Aroclor-1248 [2C]	< 0.202	U	µg/l	0.202						
Aroclor-1254	< 0.202	U	µg/l	0.202						
Aroclor-1254 [2C]	< 0.202	U	µg/l	0.202						
Aroclor-1260	< 0.202	U	µg/l	0.202						
Aroclor-1260 [2C]	< 0.202	U	µg/l	0.202						
Aroclor-1262	< 0.202	U	µg/l	0.202						
Aroclor-1262 [2C]	< 0.202	U	µg/l	0.202						
Aroclor-1268	< 0.202	U	µg/l	0.202						
Aroclor-1268 [2C]	< 0.202	U	µg/l	0.202						
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.182*		µg/l		*0.202*		*90*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.192*		µg/l		*0.202*		*95*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.202*		µg/l		*0.202*		*100*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.212*		µg/l		*0.202*		*105*	*30-150*		
LCS (1718531-BS1)						Prepared: 02-Nov-17 Analyzed: 06-Nov-17				
Aroclor-1016	**2.14**		µg/l	0.202	2.53		85	40-140		
Aroclor-1016 [2C]	**2.33**		µg/l	0.202	2.53		92	40-140		
Aroclor-1260	**2.08**		µg/l	0.202	2.53		82	40-140		
Aroclor-1260 [2C]	**2.48**		µg/l	0.202	2.53		98	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.182*		µg/l		*0.202*		*90*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.192*		µg/l		*0.202*		*95*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.202*		µg/l		*0.202*		*100*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.222*		µg/l		*0.202*		*110*	*30-150*		
LCS Dup (1718531-BSD1)						Prepared: 02-Nov-17 Analyzed: 06-Nov-17				
Aroclor-1016	**2.25**		µg/l	0.206	2.58		87	40-140	5	20
Aroclor-1016 [2C]	**2.46**		µg/l	0.206	2.58		96	40-140	5	20
Aroclor-1260	**2.32**		µg/l	0.206	2.58		90	40-140	11	20
Aroclor-1260 [2C]	**2.67**		µg/l	0.206	2.58		104	40-140	7	20
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.196*		µg/l		*0.206*		*95*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.206*		µg/l		*0.206*		*100*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.216*		µg/l		*0.206*		*105*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.247*		µg/l		*0.206*		*120*	*30-150*		
Duplicate (1718531-DUP1)			**Source: SC40914-02**			Prepared: 02-Nov-17 Analyzed: 06-Nov-17				
Aroclor-1016	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1016 [2C]	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1221	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1221 [2C]	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1232	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1232 [2C]	< 0.196	U	µg/l	0.196		BRL				20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8082A										
Batch 1718531 - SW846 3510C										
Duplicate (1718531-DUP1)			**Source: SC40914-02**			Prepared: 02-Nov-17 Analyzed: 06-Nov-17				
Aroclor-1242	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1242 [2C]	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1248	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1248 [2C]	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1254	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1254 [2C]	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1260	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1260 [2C]	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1262	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1262 [2C]	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1268	< 0.196	U	µg/l	0.196		BRL				20
Aroclor-1268 [2C]	< 0.196	U	µg/l	0.196		BRL				20
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.147*		µg/l		*0.196*		*75*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.157*		µg/l		*0.196*		*80*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.176*		µg/l		*0.196*		*90*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.186*		µg/l		*0.196*		*95*	*30-150*		
Matrix Spike (1718531-MS1)			**Source: SC40914-01**			Prepared: 02-Nov-17 Analyzed: 06-Nov-17				
Aroclor-1016	**6.48**	QM1	µg/l	0.196	2.45	BRL	264	40-140		
Aroclor-1016 [2C]	**7.65**	QM1	µg/l	0.196	2.45	BRL	312	40-140		
Aroclor-1260	**2.88**		µg/l	0.196	2.45	1.46	58	40-140		
Aroclor-1260 [2C]	**2.81**		µg/l	0.196	2.45	1.40	58	40-140		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.108*		µg/l		*0.196*		*55*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.108*		µg/l		*0.196*		*55*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.137*		µg/l		*0.196*		*70*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.137*		µg/l		*0.196*		*70*	*30-150*		
Matrix Spike Dup (1718531-MSD1)			**Source: SC40914-01**			Prepared: 02-Nov-17 Analyzed: 06-Nov-17				
Aroclor-1016	**31.2**	QM1	µg/l	0.200	2.50	BRL	1250	40-140	131	20
Aroclor-1016 [2C]	**18.7**	QM1	µg/l	0.200	2.50	BRL	748	40-140	84	20
Aroclor-1260	**3.21**		µg/l	0.200	2.50	1.46	70	40-140	11	20
Aroclor-1260 [2C]	**3.08**		µg/l	0.200	2.50	1.40	67	40-140	9	20
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr)	*0.130*		µg/l		*0.200*		*65*	*30-150*		
Surrogate: 4,4-DB-Octafluorobiphenyl (Sr) [2C]	*0.120*		µg/l		*0.200*		*60*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr)	*0.170*		µg/l		*0.200*		*85*	*30-150*		
Surrogate: Decachlorobiphenyl (Sr) [2C]	*0.160*		µg/l		*0.200*		*80*	*30-150*		

Notes and Definitions

QM1	The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.
U	Analyte included in the analysis, but not detected at or above the MDL.
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

SC 40914 e

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CHAIN OF CUSTODY RECORD

Page 1 of 2

Special Handling:
- ✓ Standard TAT - 7 to 10 business days
- ☐ Rush TAT - Date Needed: _____

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 30 days unless otherwise instructed.

Report To: ARCADIS
855 Route 146 Suite 210
Clifton Park, NY 12065
Jeremy.Wyckoff@arcadis.com
Telephone #: 518-250-7335
Project Mgr: Jeremy Wyckoff

Invoice To: JEREMY.WYCKOFF
JEREMY.WYCKOFF@ARCADIS.COM
518-250-7335
P.O No.: 30266404.0000 Quote #: _____

Project No: 30266404.0000
Site Name: Oswego Castings
Location: Oswego, ~~NY~~ State: NY
Sampler(s): J. MULPINS / K. LILOIA

F=Field Filtered 1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid
7=CH3OH 8=$NaHSO_4$ 9=Deionized Water 10=H_3PO_4 11=_____ 12=_____

DW=Drinking Water GW=Groundwater SW=Surface Water WW=Waste Water
O=Oil SO=Soil SL=Sludge A=Indoor/Ambient Air SG=Soil Gas
X1=_____ X2=_____ X3=_____

G= Grab C=Compsite

Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analysis: 8082 PCBs	Check if chlorinated
40914-01	MW-1	10/26/17	1020	G	GW		2			X	☐
↓	MW-1-MS	10/26/17	1020	G	GW		2			X	☐
↓	MW-1-MSD	10/26/17	1020	G	GW		2			X	☐
-02	MW-2R	10/26/17	1040	G	GW		2			X	☐
-03	MW-X-DUP	10/26/17	—	G	GW		2			X	☐
-04	MW-4	10/26/17	1240	G	GW		2			X	☐
-05	MW-3	10/26/17	1410	G	GW		2			X	☐
-06	MW-6	10/26/17	1515	G	GW		2			X	☐
-07	MW-7	10/26/17	1715	G	GW		2			X	☐
↓-08	MW-5	10/27/17	0925	G	GW		2			X	☐

List Preservative Code below:

QA/QC Reporting Notes:
* additional charges may appply

MA DEP MCP CAM Report? ☐ Yes ☐ No
CT DPH RCP Report? ☐ Yes ☐ No
☐ Standard ☐ No QC ☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full*
☐ Tier II* ☑ Tier IV*
☑ Other: NYSDEC EQUIS
State-specific reporting standards:

Relinquished by:	Received by:	Date:	Time:
[signature]	[signature]	10/27/17	1155
	[signature]	10/31/17	1220

Temp °C: Observed 4.8°C; Correction Factor 0; Corrected 4.8°C; IR ID # 3

3.8/0/3.8/2

✓ EDD format: NYSDEC EQUIS
✓ E-mail to: Jeremy.Wyckoff@arcadis.com

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☒ Iced ☐ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

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CHAIN OF CUSTODY RECORD

Page 2 of 2

Special Handling:
- [x] Standard TAT - 7 to 10 business days
- [ ] Rush TAT - Date Needed: _____

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 30 days unless otherwise instructed.

Report To: ARCADIS
855 Route 146 Suite 210
Clifton Park, NY 12065
Jeremy.Wyckoff@arcadis.com
Telephone #: 518-250-7335
Project Mgr: Jeremy Wyckoff

Invoice To: JEREMY WYCKOFF
JEREMY.WYCKOFF@ARCADIS.COM
518-250-7335
P.O No.: 00266404.0000 Quote #:

Project No: 00266404.0000
Site Name: OSWEGO CASTINGS
Location: OSWEGO State: NY
Sampler(s): JMULLINS/K.LICOLA

F=Field Filtered 1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid
7=CH3OH 8=$NaHSO_4$ 9=Deionized Water 10=H_3PO_4 11=_____ 12=_____

DW=Drinking Water GW=Groundwater SW=Surface Water WW=Waste Water
O=Oil SO=Soil SL=Sludge A=Indoor/Ambient Air SG=Soil Gas
X1=_____ X2=_____ X3=_____

G= Grab C=Composite

Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analysis: 8082 PCBs	Check if chlorinated
40914-09	FB-X	10/27/17	0900	G	GW		2			X	☐
											☐
											☐
											☐
											☐
											☐
											☐
											☐
											☐
											☐

List Preservative Code below:

QA/QC Reporting Notes:
* additional charges may appply

MA DEP MCP CAM Report? ☐ Yes ☐ No
CT DPH RCP Report? ☐ Yes ☐ No
☐ Standard ☐ No QC
☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full*
☐ Tier II* ☐ Tier IV*
☑ Other: NJSDEC EQUIS
State-specific reporting standards:

3/8/18 3/8/18

Relinquished by:	Received by:	Date:	Time:	Temp °C
[signature]	[signature]	10/27/17	1155	Observed 4.8°C
	[signature]	10/31/17	1220	Correction Factor 0
				Corrected 4.8°C
				IR ID # 3

☑ EDD format: NYSDEC EQUIS
☑ E-mail to: Jeremy.Wyckoff@arcadis.com

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☒ Iced ☐ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

Batch Summary

1718531

Semivolatile Organic Compounds by GC

1718531-BLK1
1718531-BS1
1718531-BSD1
1718531-DUP1
1718531-MS1
1718531-MSD1
SC40914-01 (MW-1)
SC40914-02 (MW-2R)
SC40914-03 (MW-X-Dup)
SC40914-04 (MW-4)
SC40914-05 (MW-3)
SC40914-06 (MW-6)
SC40914-07 (MW-7)
SC40914-08 (MW-5)
SC40914-09 (FB-X)

S705626

Semivolatile Organic Compounds by GC

S705626-CAL1
S705626-CAL2
S705626-CAL3
S705626-CAL4
S705626-CAL5
S705626-CAL6
S705626-CAL7
S705626-CAL8
S705626-CAL9
S705626-CALA
S705626-CALB
S705626-CALC
S705626-CALD
S705626-CALE
S705626-CALF
S705626-CALG
S705626-CALH
S705626-CALI
S705626-CALJ
S705626-CALK
S705626-CALL
S705626-CALM
S705626-CALN
S705626-CALO
S705626-CALP
S705626-CALQ
S705626-CALR
S705626-CALS
S705626-CALT
S705626-CALU
S705626-ICV1
S705626-ICV2
S705626-ICV3
S705626-ICV4
S705626-ICV5
S705626-ICV6
S705626-LCV1
S705626-LCV2
S705626-LCV3
S705626-LCV4
S705626-LCV5
S705626-LCV6

S709797

Semivolatile Organic Compounds by GC

S709797-CCV1
S709797-CCV2
S709797-CCV3
S709797-CCV4
S709797-CCV5
S709797-IBL1
S709797-IBL2
S709797-IBL3

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Edison
777 New Durham Road
Edison, NJ 08817
Tel: (732)549-3900

TestAmerica Job ID: 460-143917-1
Client Project/Site: NY Standby - Oswego Castings 2017

For:
ARCADIS U.S. Inc
855 Route 146
Suite 210
Clifton Park, New York 12065

Attn: Jasmine Mullins

Judy Stone

Authorized for release by:
11/10/2017 2:42:54 PM

Judy Stone, Senior Project Manager
(484)685-0868
judy.stone@testamericainc.com

Table of Contents

Definitions/Glossary

Client: ARCADIS U.S. Inc
Project/Site: NY Standby - Oswego Castings 2017

TestAmerica Job ID: 460-143917-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Analyzed for but not detected.

LCMS

Qualifier	Qualifier Description
U	Analyzed for but not detected.
J	Indicates an estimated value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: ARCADIS U.S. Inc
Project/Site: NY Standby - Oswego Castings 2017

TestAmerica Job ID: 460-143917-1

Job ID: 460-143917-1

Laboratory: TestAmerica Edison

Narrative

Job Narrative
460-143917-1

Receipt
The samples were received on 10/28/2017 11:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.3º C.

Receipt Exceptions
TRIP BLANK (460-143917-11) - one vial had ice in it.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

LCMS
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: NY Standby - Oswego Castings 2017

TestAmerica Job ID: 460-143917-1

Client Sample ID: MW-1 — Lab Sample ID: 460-143917-1

No Detections.

Client Sample ID: MW-2R — Lab Sample ID: 460-143917-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.42	J	2.00	0.92	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.65	J	2.00	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	3.02		2.00	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.96	J	2.00	1.28	ng/L	1		WS-LC-0025 At1	Total/NA

Client Sample ID: MW-3 — Lab Sample ID: 460-143917-3

No Detections.

Client Sample ID: MW-4 — Lab Sample ID: 460-143917-4

No Detections.

Client Sample ID: MW-5 — Lab Sample ID: 460-143917-5

No Detections.

Client Sample ID: MW-6 — Lab Sample ID: 460-143917-6

No Detections.

Client Sample ID: MW-7 — Lab Sample ID: 460-143917-7

No Detections.

Client Sample ID: EB-PROBE — Lab Sample ID: 460-143917-8

No Detections.

Client Sample ID: EB-TUBING — Lab Sample ID: 460-143917-9

No Detections.

Client Sample ID: FB-X — Lab Sample ID: 460-143917-10

No Detections.

Client Sample ID: TRIP BLANK — Lab Sample ID: 460-143917-11

No Detections.

Client Sample ID: MW-X-DUP — Lab Sample ID: 460-143917-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.30	J	2.00	0.92	ng/L	1		WS-LC-0025 At1	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: NY Standby - Oswego Castings 2017

TestAmerica Job ID: 460-143917-1

Client Sample ID: MW-X-DUP (Continued)

Lab Sample ID: 460-143917-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	1.69	J	2.00	0.80	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanoic acid (PFOA)	2.72		2.00	0.75	ng/L	1		WS-LC-0025 At1	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.89	J	2.00	1.28	ng/L	1		WS-LC-0025 At1	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-1

Date Collected: 10/26/17 10:20
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-1
Matrix: Water

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.20	ug/L			11/03/17 14:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*71 - 144*		*11/03/17 14:09*	*1*
4-Bromofluorobenzene	*95*		*72 - 133*		*11/03/17 14:09*	*1*

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.00	U	2.00	0.92	ng/L		11/01/17 10:41	11/02/17 08:38	1
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	2.00	0.87	ng/L		11/01/17 10:41	11/02/17 08:38	1
Perfluoroheptanoic acid (PFHpA)	2.00	U	2.00	0.80	ng/L		11/01/17 10:41	11/02/17 08:38	1
Perfluorooctanoic acid (PFOA)	2.00	U	2.00	0.75	ng/L		11/01/17 10:41	11/02/17 08:38	1
Perfluorooctanesulfonic acid (PFOS)	2.00	U	2.00	1.28	ng/L		11/01/17 10:41	11/02/17 08:38	1
Perfluorononanoic acid (PFNA)	2.00	U	2.00	0.65	ng/L		11/01/17 10:41	11/02/17 08:38	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*109*		*25 - 150*	*11/01/17 10:41*	*11/02/17 08:38*	*1*
13C4-PFHpA	*112*		*25 - 150*	*11/01/17 10:41*	*11/02/17 08:38*	*1*
13C4 PFOA	*108*		*25 - 150*	*11/01/17 10:41*	*11/02/17 08:38*	*1*
13C4 PFOS	*101*		*25 - 150*	*11/01/17 10:41*	*11/02/17 08:38*	*1*
13C5 PFNA	*114*		*25 - 150*	*11/01/17 10:41*	*11/02/17 08:38*	*1*

Client Sample ID: MW-2R

Date Collected: 10/26/17 10:40
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-2
Matrix: Water

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.20	ug/L			11/03/17 14:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*71 - 144*		*11/03/17 14:55*	*1*
4-Bromofluorobenzene	*93*		*72 - 133*		*11/03/17 14:55*	*1*

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**1.42**	**J**	2.00	0.92	ng/L		11/01/17 10:41	11/02/17 09:33	1
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	2.00	0.87	ng/L		11/01/17 10:41	11/02/17 09:33	1
Perfluoroheptanoic acid (PFHpA)	**1.65**	**J**	2.00	0.80	ng/L		11/01/17 10:41	11/02/17 09:33	1
Perfluorooctanoic acid (PFOA)	**3.02**		2.00	0.75	ng/L		11/01/17 10:41	11/02/17 09:33	1
Perfluorooctanesulfonic acid (PFOS)	**1.96**	**J**	2.00	1.28	ng/L		11/01/17 10:41	11/02/17 09:33	1
Perfluorononanoic acid (PFNA)	2.00	U	2.00	0.65	ng/L		11/01/17 10:41	11/02/17 09:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*113*		*25 - 150*	*11/01/17 10:41*	*11/02/17 09:33*	*1*
13C4-PFHpA	*110*		*25 - 150*	*11/01/17 10:41*	*11/02/17 09:33*	*1*
13C4 PFOA	*113*		*25 - 150*	*11/01/17 10:41*	*11/02/17 09:33*	*1*
13C4 PFOS	*106*		*25 - 150*	*11/01/17 10:41*	*11/02/17 09:33*	*1*
13C5 PFNA	*116*		*25 - 150*	*11/01/17 10:41*	*11/02/17 09:33*	*1*

Client Sample ID: MW-3

Date Collected: 10/26/17 14:10
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-3
Matrix: Water

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.20	ug/L			11/01/17 22:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*71 - 144*		*11/01/17 22:35*	*1*
4-Bromofluorobenzene	*94*		*72 - 133*		*11/01/17 22:35*	*1*

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.00	U	2.00	0.92	ng/L		11/01/17 10:41	11/02/17 09:51	1
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	2.00	0.87	ng/L		11/01/17 10:41	11/02/17 09:51	1
Perfluoroheptanoic acid (PFHpA)	2.00	U	2.00	0.80	ng/L		11/01/17 10:41	11/02/17 09:51	1
Perfluorooctanoic acid (PFOA)	2.00	U	2.00	0.75	ng/L		11/01/17 10:41	11/02/17 09:51	1
Perfluorooctanesulfonic acid (PFOS)	2.00	U	2.00	1.28	ng/L		11/01/17 10:41	11/02/17 09:51	1
Perfluorononanoic acid (PFNA)	2.00	U	2.00	0.65	ng/L		11/01/17 10:41	11/02/17 09:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*119*		*25 - 150*	*11/01/17 10:41*	*11/02/17 09:51*	*1*
13C4-PFHpA	*119*		*25 - 150*	*11/01/17 10:41*	*11/02/17 09:51*	*1*
13C4 PFOA	*122*		*25 - 150*	*11/01/17 10:41*	*11/02/17 09:51*	*1*
13C4 PFOS	*111*		*25 - 150*	*11/01/17 10:41*	*11/02/17 09:51*	*1*
13C5 PFNA	*128*		*25 - 150*	*11/01/17 10:41*	*11/02/17 09:51*	*1*

Client Sample ID: MW-4

Date Collected: 10/26/17 12:40
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-4
Matrix: Water

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.20	ug/L			11/03/17 15:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*71 - 144*		*11/03/17 15:18*	*1*
4-Bromofluorobenzene	*94*		*72 - 133*		*11/03/17 15:18*	*1*

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.00	U	2.00	0.92	ng/L		11/01/17 10:41	11/02/17 10:10	1
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	2.00	0.87	ng/L		11/01/17 10:41	11/02/17 10:10	1
Perfluoroheptanoic acid (PFHpA)	2.00	U	2.00	0.80	ng/L		11/01/17 10:41	11/02/17 10:10	1
Perfluorooctanoic acid (PFOA)	2.00	U	2.00	0.75	ng/L		11/01/17 10:41	11/02/17 10:10	1
Perfluorooctanesulfonic acid (PFOS)	2.00	U	2.00	1.28	ng/L		11/01/17 10:41	11/02/17 10:10	1
Perfluorononanoic acid (PFNA)	2.00	U	2.00	0.65	ng/L		11/01/17 10:41	11/02/17 10:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*120*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:10*	*1*
13C4-PFHpA	*123*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:10*	*1*
13C4 PFOA	*118*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:10*	*1*
13C4 PFOS	*112*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:10*	*1*
13C5 PFNA	*127*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:10*	*1*

Client Sample ID: MW-5

Date Collected: 10/26/17 09:25
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-5
Matrix: Water

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.20	ug/L			11/03/17 15:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*71 - 144*		*11/03/17 15:41*	*1*
4-Bromofluorobenzene	*92*		*72 - 133*		*11/03/17 15:41*	*1*

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.00	U	2.00	0.92	ng/L		11/01/17 10:41	11/02/17 10:28	1
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	2.00	0.87	ng/L		11/01/17 10:41	11/02/17 10:28	1
Perfluoroheptanoic acid (PFHpA)	2.00	U	2.00	0.80	ng/L		11/01/17 10:41	11/02/17 10:28	1
Perfluorooctanoic acid (PFOA)	2.00	U	2.00	0.75	ng/L		11/01/17 10:41	11/02/17 10:28	1
Perfluorooctanesulfonic acid (PFOS)	2.00	U	2.00	1.28	ng/L		11/01/17 10:41	11/02/17 10:28	1
Perfluorononanoic acid (PFNA)	2.00	U	2.00	0.65	ng/L		11/01/17 10:41	11/02/17 10:28	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*110*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:28*	*1*
13C4-PFHpA	*109*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:28*	*1*
13C4 PFOA	*107*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:28*	*1*
13C4 PFOS	*103*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:28*	*1*
13C5 PFNA	*113*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:28*	*1*

Client Sample ID: MW-6

Date Collected: 10/26/17 15:15
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-6
Matrix: Water

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.20	ug/L			11/03/17 16:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*71 - 144*		*11/03/17 16:04*	*1*
4-Bromofluorobenzene	*92*		*72 - 133*		*11/03/17 16:04*	*1*

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.00	U	2.00	0.92	ng/L		11/01/17 10:41	11/02/17 10:46	1
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	2.00	0.87	ng/L		11/01/17 10:41	11/02/17 10:46	1
Perfluoroheptanoic acid (PFHpA)	2.00	U	2.00	0.80	ng/L		11/01/17 10:41	11/02/17 10:46	1
Perfluorooctanoic acid (PFOA)	2.00	U	2.00	0.75	ng/L		11/01/17 10:41	11/02/17 10:46	1
Perfluorooctanesulfonic acid (PFOS)	2.00	U	2.00	1.28	ng/L		11/01/17 10:41	11/02/17 10:46	1
Perfluorononanoic acid (PFNA)	2.00	U	2.00	0.65	ng/L		11/01/17 10:41	11/02/17 10:46	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*107*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:46*	*1*
13C4-PFHpA	*108*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:46*	*1*
13C4 PFOA	*108*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:46*	*1*
13C4 PFOS	*101*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:46*	*1*
13C5 PFNA	*116*		*25 - 150*	*11/01/17 10:41*	*11/02/17 10:46*	*1*

Client Sample ID: MW-7

Date Collected: 10/26/17 17:15
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-7

Matrix: Water

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.20	ug/L			11/03/17 16:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*71 - 144*		*11/03/17 16:27*	*1*
4-Bromofluorobenzene	*92*		*72 - 133*		*11/03/17 16:27*	*1*

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.00	U	2.00	0.92	ng/L		11/01/17 10:41	11/02/17 11:23	1
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	2.00	0.87	ng/L		11/01/17 10:41	11/02/17 11:23	1
Perfluoroheptanoic acid (PFHpA)	2.00	U	2.00	0.80	ng/L		11/01/17 10:41	11/02/17 11:23	1
Perfluorooctanoic acid (PFOA)	2.00	U	2.00	0.75	ng/L		11/01/17 10:41	11/02/17 11:23	1
Perfluorooctanesulfonic acid (PFOS)	2.00	U	2.00	1.28	ng/L		11/01/17 10:41	11/02/17 11:23	1
Perfluorononanoic acid (PFNA)	2.00	U	2.00	0.65	ng/L		11/01/17 10:41	11/02/17 11:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*115*		*25 - 150*	*11/01/17 10:41*	*11/02/17 11:23*	*1*
13C4-PFHpA	*120*		*25 - 150*	*11/01/17 10:41*	*11/02/17 11:23*	*1*
13C4 PFOA	*117*		*25 - 150*	*11/01/17 10:41*	*11/02/17 11:23*	*1*
13C4 PFOS	*106*		*25 - 150*	*11/01/17 10:41*	*11/02/17 11:23*	*1*
13C5 PFNA	*121*		*25 - 150*	*11/01/17 10:41*	*11/02/17 11:23*	*1*

Client Sample ID: EB-PROBE

Date Collected: 10/26/17 11:30
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-8

Matrix: Water

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.20	ug/L			11/01/17 22:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*71 - 144*		*11/01/17 22:11*	*1*
4-Bromofluorobenzene	*93*		*72 - 133*		*11/01/17 22:11*	*1*

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.00	U	2.00	0.92	ng/L		11/01/17 10:41	11/02/17 11:41	1
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	2.00	0.87	ng/L		11/01/17 10:41	11/02/17 11:41	1
Perfluoroheptanoic acid (PFHpA)	2.00	U	2.00	0.80	ng/L		11/01/17 10:41	11/02/17 11:41	1
Perfluorooctanoic acid (PFOA)	2.00	U	2.00	0.75	ng/L		11/01/17 10:41	11/02/17 11:41	1
Perfluorooctanesulfonic acid (PFOS)	2.00	U	2.00	1.28	ng/L		11/01/17 10:41	11/02/17 11:41	1
Perfluorononanoic acid (PFNA)	2.00	U	2.00	0.65	ng/L		11/01/17 10:41	11/02/17 11:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*107*		*25 - 150*	*11/01/17 10:41*	*11/02/17 11:41*	*1*
13C4-PFHpA	*109*		*25 - 150*	*11/01/17 10:41*	*11/02/17 11:41*	*1*
13C4 PFOA	*106*		*25 - 150*	*11/01/17 10:41*	*11/02/17 11:41*	*1*
13C4 PFOS	*102*		*25 - 150*	*11/01/17 10:41*	*11/02/17 11:41*	*1*
13C5 PFNA	*114*		*25 - 150*	*11/01/17 10:41*	*11/02/17 11:41*	*1*

Client Sample ID: EB-TUBING

Lab Sample ID: 460-143917-9

Date Collected: 10/26/17 15:20

Matrix: Water

Date Received: 10/28/17 11:50

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.20	ug/L			11/03/17 14:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*71 - 144*		*11/03/17 14:32*	*1*
4-Bromofluorobenzene	*95*		*72 - 133*		*11/03/17 14:32*	*1*

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.00	U	2.00	0.92	ng/L		11/01/17 10:41	11/02/17 12:00	1
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	2.00	0.87	ng/L		11/01/17 10:41	11/02/17 12:00	1
Perfluoroheptanoic acid (PFHpA)	2.00	U	2.00	0.80	ng/L		11/01/17 10:41	11/02/17 12:00	1
Perfluorooctanoic acid (PFOA)	2.00	U	2.00	0.75	ng/L		11/01/17 10:41	11/02/17 12:00	1
Perfluorooctanesulfonic acid (PFOS)	2.00	U	2.00	1.28	ng/L		11/01/17 10:41	11/02/17 12:00	1
Perfluorononanoic acid (PFNA)	2.00	U	2.00	0.65	ng/L		11/01/17 10:41	11/02/17 12:00	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*114*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:00*	*1*
13C4-PFHpA	*116*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:00*	*1*
13C4 PFOA	*115*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:00*	*1*
13C4 PFOS	*111*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:00*	*1*
13C5 PFNA	*124*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:00*	*1*

Client Sample ID: FB-X

Lab Sample ID: 460-143917-10

Date Collected: 10/26/17 15:10

Matrix: Water

Date Received: 10/28/17 11:50

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.20	ug/L			11/03/17 13:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*71 - 144*		*11/03/17 13:22*	*1*
4-Bromofluorobenzene	*96*		*72 - 133*		*11/03/17 13:22*	*1*

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.00	U	2.00	0.92	ng/L		11/01/17 10:41	11/02/17 12:18	1
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	2.00	0.87	ng/L		11/01/17 10:41	11/02/17 12:18	1
Perfluoroheptanoic acid (PFHpA)	2.00	U	2.00	0.80	ng/L		11/01/17 10:41	11/02/17 12:18	1
Perfluorooctanoic acid (PFOA)	2.00	U	2.00	0.75	ng/L		11/01/17 10:41	11/02/17 12:18	1
Perfluorooctanesulfonic acid (PFOS)	2.00	U	2.00	1.28	ng/L		11/01/17 10:41	11/02/17 12:18	1
Perfluorononanoic acid (PFNA)	2.00	U	2.00	0.65	ng/L		11/01/17 10:41	11/02/17 12:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*110*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:18*	*1*
13C4-PFHpA	*112*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:18*	*1*
13C4 PFOA	*110*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:18*	*1*
13C4 PFOS	*102*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:18*	*1*
13C5 PFNA	*115*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:18*	*1*

Client Sample ID: TRIP BLANK

Lab Sample ID: 460-143917-11
Date Collected: 10/26/17 00:00
Matrix: Water
Date Received: 10/28/17 11:50

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.20	ug/L			11/03/17 13:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*71 - 144*		*11/03/17 13:45*	*1*
4-Bromofluorobenzene	*95*		*72 - 133*		*11/03/17 13:45*	*1*

Client Sample ID: MW-X-DUP

Lab Sample ID: 460-143917-12
Date Collected: 10/26/17 00:00
Matrix: Water
Date Received: 10/28/17 11:50

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.20	ug/L			11/03/17 16:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*71 - 144*		*11/03/17 16:50*	*1*
4-Bromofluorobenzene	*93*		*72 - 133*		*11/03/17 16:50*	*1*

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**1.30**	**J**	2.00	0.92	ng/L		11/01/17 10:41	11/02/17 12:36	1
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	2.00	0.87	ng/L		11/01/17 10:41	11/02/17 12:36	1
Perfluoroheptanoic acid (PFHpA)	**1.69**	**J**	2.00	0.80	ng/L		11/01/17 10:41	11/02/17 12:36	1
Perfluorooctanoic acid (PFOA)	**2.72**		2.00	0.75	ng/L		11/01/17 10:41	11/02/17 12:36	1
Perfluorooctanesulfonic acid (PFOS)	**1.89**	**J**	2.00	1.28	ng/L		11/01/17 10:41	11/02/17 12:36	1
Perfluorononanoic acid (PFNA)	2.00	U	2.00	0.65	ng/L		11/01/17 10:41	11/02/17 12:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*113*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:36*	*1*
13C4-PFHpA	*113*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:36*	*1*
13C4 PFOA	*113*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:36*	*1*
13C4 PFOS	*104*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:36*	*1*
13C5 PFNA	*118*		*25 - 150*	*11/01/17 10:41*	*11/02/17 12:36*	*1*

Surrogate Summary

Client: ARCADIS U.S. Inc
Project/Site: NY Standby - Oswego Castings 2017

TestAmerica Job ID: 460-143917-1

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	12DCE (71-144)	BFB (72-133)
460-143917-1	MW-1	96	95
460-143917-1 MS	MW-1	110	97
460-143917-1 MSD	MW-1	109	96
460-143917-2	MW-2R	92	93
460-143917-3	MW-3	120	94
460-143917-4	MW-4	98	94
460-143917-5	MW-5	99	92
460-143917-6	MW-6	94	92
460-143917-7	MW-7	97	92
460-143917-8	EB-PROBE	117	93
460-143917-9	EB-TUBING	95	95
460-143917-10	FB-X	95	96
460-143917-11	TRIP BLANK	96	95
460-143917-12	MW-X-DUP	100	93
LCS 460-473895/3	Lab Control Sample	116	92
LCS 460-474310/3	Lab Control Sample	89	97
LCSD 460-473895/4	Lab Control Sample Dup	116	91
LCSD 460-474310/4	Lab Control Sample Dup	92	97
MB 460-473895/7	Method Blank	117	91
MB 460-474310/7	Method Blank	94	98

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)

BFB = 4-Bromofluorobenzene

Isotope Dilution Summary

Client: ARCADIS U.S. Inc
Project/Site: NY Standby - Oswego Castings 2017

TestAmerica Job ID: 460-143917-1

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)				
Lab Sample ID	Client Sample ID	3O2 PFHx (25-150)	3C4-PFHp (25-150)	3C4 PFO/ (25-150)	3C4 PFO$ (25-150)	3C5 PFN/ (25-150)
460-143917-1	MW-1	109	112	108	101	114
460-143917-1 MS	MW-1	110	113	111	101	115
460-143917-1 MSD	MW-1	112	113	113	102	118
460-143917-2	MW-2R	113	110	113	106	116
460-143917-3	MW-3	119	119	122	111	128
460-143917-4	MW-4	120	123	118	112	127
460-143917-5	MW-5	110	109	107	103	113
460-143917-6	MW-6	107	108	108	101	116
460-143917-7	MW-7	115	120	117	106	121
460-143917-8	EB-PROBE	107	109	106	102	114
460-143917-9	EB-TUBING	114	116	115	111	124
460-143917-10	FB-X	110	112	110	102	115
460-143917-12	MW-X-DUP	113	113	113	104	118
LCS 320-192344/2-A	Lab Control Sample	106	111	106	100	109
MB 320-192344/1-A	Method Blank	108	111	109	102	110

Surrogate Legend

18O2 PFHxS = 18O2 PFHxS
13C4-PFHpA = 13C4-PFHpA
13C4 PFOA = 13C4 PFOA
13C4 PFOS = 13C4 PFOS
13C5 PFNA = 13C5 PFNA

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 460-473895/7
Matrix: Water
Analysis Batch: 473895

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.20	ug/L			11/01/17 21:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*71 - 144*		*11/01/17 21:31*	*1*
4-Bromofluorobenzene	*91*		*72 - 133*		*11/01/17 21:31*	*1*

Lab Sample ID: LCS 460-473895/3
Matrix: Water
Analysis Batch: 473895

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			5.00	4.36		ug/L		87	66 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*116*		*71 - 144*
4-Bromofluorobenzene	*92*		*72 - 133*

Lab Sample ID: LCSD 460-473895/4
Matrix: Water
Analysis Batch: 473895

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane			5.00	4.19		ug/L		84	66 - 135	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*116*		*71 - 144*
4-Bromofluorobenzene	*91*		*72 - 133*

Lab Sample ID: 460-143917-1 MS
Matrix: Water
Analysis Batch: 473895

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	0.40	U	5.00	5.03		ug/L		101	66 - 135		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*110*		*71 - 144*
4-Bromofluorobenzene	*97*		*72 - 133*

Lab Sample ID: 460-143917-1 MSD
Matrix: Water
Analysis Batch: 473895

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	0.40	U	5.00	4.84		ug/L		97	66 - 135	4	30

Method: 8260C SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 460-143917-1 MSD
Matrix: Water
Analysis Batch: 473895

Client Sample ID: MW-1
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*109*		*71 - 144*
4-Bromofluorobenzene	*96*		*72 - 133*

Lab Sample ID: MB 460-474310/7
Matrix: Water
Analysis Batch: 474310

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.20	ug/L			11/03/17 09:54	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*71 - 144*		*11/03/17 09:54*	*1*
4-Bromofluorobenzene	*98*		*72 - 133*		*11/03/17 09:54*	*1*

Lab Sample ID: LCS 460-474310/3
Matrix: Water
Analysis Batch: 474310

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			5.00	5.20		ug/L		104	66 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*71 - 144*
4-Bromofluorobenzene	*97*		*72 - 133*

Lab Sample ID: LCSD 460-474310/4
Matrix: Water
Analysis Batch: 474310

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane			5.00	4.78		ug/L		96	66 - 135	8	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*71 - 144*
4-Bromofluorobenzene	*97*		*72 - 133*

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances

Lab Sample ID: MB 320-192344/1-A
Matrix: Water
Analysis Batch: 192581

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 192344

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.00	U	2.00	0.92	ng/L		11/01/17 10:41	11/02/17 08:01	1
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	2.00	0.87	ng/L		11/01/17 10:41	11/02/17 08:01	1
Perfluoroheptanoic acid (PFHpA)	2.00	U	2.00	0.80	ng/L		11/01/17 10:41	11/02/17 08:01	1
Perfluorooctanoic acid (PFOA)	2.00	U	2.00	0.75	ng/L		11/01/17 10:41	11/02/17 08:01	1

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-192344/1-A
Matrix: Water
Analysis Batch: 192581

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 192344

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	2.00	U	2.00	1.28	ng/L		11/01/17 10:41	11/02/17 08:01	1
Perfluorononanoic acid (PFNA)	2.00	U	2.00	0.65	ng/L		11/01/17 10:41	11/02/17 08:01	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*108*		*25 - 150*	*11/01/17 10:41*	*11/02/17 08:01*	*1*
13C4-PFHpA	*111*		*25 - 150*	*11/01/17 10:41*	*11/02/17 08:01*	*1*
13C4 PFOA	*109*		*25 - 150*	*11/01/17 10:41*	*11/02/17 08:01*	*1*
13C4 PFOS	*102*		*25 - 150*	*11/01/17 10:41*	*11/02/17 08:01*	*1*
13C5 PFNA	*110*		*25 - 150*	*11/01/17 10:41*	*11/02/17 08:01*	*1*

Lab Sample ID: LCS 320-192344/2-A
Matrix: Water
Analysis Batch: 192581

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 192344

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanesulfonic acid (PFBS)	17.7	16.01		ng/L		91	72 - 151
Perfluorohexanesulfonic acid (PFHxS)	18.2	16.47		ng/L		91	73 - 157
Perfluoroheptanoic acid (PFHpA)	20.0	18.47		ng/L		92	71 - 138
Perfluorooctanoic acid (PFOA)	20.0	18.18		ng/L		91	70 - 140
Perfluorooctanesulfonic acid (PFOS)	18.6	16.35		ng/L		88	69 - 144
Perfluorononanoic acid (PFNA)	20.0	18.79		ng/L		94	73 - 147

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
18O2 PFHxS	*106*		*25 - 150*
13C4-PFHpA	*111*		*25 - 150*
13C4 PFOA	*106*		*25 - 150*
13C4 PFOS	*100*		*25 - 150*
13C5 PFNA	*109*		*25 - 150*

Lab Sample ID: 460-143917-1 MS
Matrix: Water
Analysis Batch: 192581

Client Sample ID: MW-1
Prep Type: Total/NA
Prep Batch: 192344

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanesulfonic acid (PFBS)	2.00	U	16.0	14.21		ng/L		89	55 - 147
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	16.5	14.87		ng/L		90	58 - 138
Perfluoroheptanoic acid (PFHpA)	2.00	U	18.1	16.49		ng/L		91	63 - 135
Perfluorooctanoic acid (PFOA)	2.00	U	18.1	15.91		ng/L		88	63 - 141
Perfluorooctanesulfonic acid (PFOS)	2.00	U	16.8	14.07		ng/L		84	47 - 162
Perfluorononanoic acid (PFNA)	2.00	U	18.1	16.26		ng/L		90	71 - 140

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
18O2 PFHxS	*110*		*25 - 150*
13C4-PFHpA	*113*		*25 - 150*

Method: WS-LC-0025 At1 - Perfluorinated Alkyl Substances (Continued)

Lab Sample ID: 460-143917-1 MS
Matrix: Water
Analysis Batch: 192581

Client Sample ID: MW-1
Prep Type: Total/NA
Prep Batch: 192344

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFOA	*111*		*25 - 150*
13C4 PFOS	*101*		*25 - 150*
13C5 PFNA	*115*		*25 - 150*

Lab Sample ID: 460-143917-1 MSD
Matrix: Water
Analysis Batch: 192581

Client Sample ID: MW-1
Prep Type: Total/NA
Prep Batch: 192344

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanesulfonic acid (PFBS)	2.00	U	16.1	14.14		ng/L		88	55 - 147	0	30
Perfluorohexanesulfonic acid (PFHxS)	2.00	U	16.5	14.83		ng/L		90	58 - 138	0	30
Perfluoroheptanoic acid (PFHpA)	2.00	U	18.2	16.69		ng/L		92	63 - 135	1	30
Perfluorooctanoic acid (PFOA)	2.00	U	18.2	16.32		ng/L		90	63 - 141	3	30
Perfluorooctanesulfonic acid (PFOS)	2.00	U	16.9	13.97		ng/L		83	47 - 162	1	30
Perfluorononanoic acid (PFNA)	2.00	U	18.2	16.20		ng/L		89	71 - 140	0	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
18O2 PFHxS	*112*		*25 - 150*
13C4-PFHpA	*113*		*25 - 150*
13C4 PFOA	*113*		*25 - 150*
13C4 PFOS	*102*		*25 - 150*
13C5 PFNA	*118*		*25 - 150*

GC/MS VOA

Analysis Batch: 473895

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-143917-3	MW-3	Total/NA	Water	8260C SIM	
460-143917-8	EB-PROBE	Total/NA	Water	8260C SIM	
MB 460-473895/7	Method Blank	Total/NA	Water	8260C SIM	
LCS 460-473895/3	Lab Control Sample	Total/NA	Water	8260C SIM	
LCSD 460-473895/4	Lab Control Sample Dup	Total/NA	Water	8260C SIM	
460-143917-1 MS	MW-1	Total/NA	Water	8260C SIM	
460-143917-1 MSD	MW-1	Total/NA	Water	8260C SIM	

Analysis Batch: 474310

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-143917-1	MW-1	Total/NA	Water	8260C SIM	
460-143917-2	MW-2R	Total/NA	Water	8260C SIM	
460-143917-4	MW-4	Total/NA	Water	8260C SIM	
460-143917-5	MW-5	Total/NA	Water	8260C SIM	
460-143917-6	MW-6	Total/NA	Water	8260C SIM	
460-143917-7	MW-7	Total/NA	Water	8260C SIM	
460-143917-9	EB-TUBING	Total/NA	Water	8260C SIM	
460-143917-10	FB-X	Total/NA	Water	8260C SIM	
460-143917-11	TRIP BLANK	Total/NA	Water	8260C SIM	
460-143917-12	MW-X-DUP	Total/NA	Water	8260C SIM	
MB 460-474310/7	Method Blank	Total/NA	Water	8260C SIM	
LCS 460-474310/3	Lab Control Sample	Total/NA	Water	8260C SIM	
LCSD 460-474310/4	Lab Control Sample Dup	Total/NA	Water	8260C SIM	

LCMS

Prep Batch: 192344

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-143917-1	MW-1	Total/NA	Water	PFAS Prep	
460-143917-2	MW-2R	Total/NA	Water	PFAS Prep	
460-143917-3	MW-3	Total/NA	Water	PFAS Prep	
460-143917-4	MW-4	Total/NA	Water	PFAS Prep	
460-143917-5	MW-5	Total/NA	Water	PFAS Prep	
460-143917-6	MW-6	Total/NA	Water	PFAS Prep	
460-143917-7	MW-7	Total/NA	Water	PFAS Prep	
460-143917-8	EB-PROBE	Total/NA	Water	PFAS Prep	
460-143917-9	EB-TUBING	Total/NA	Water	PFAS Prep	
460-143917-10	FB-X	Total/NA	Water	PFAS Prep	
460-143917-12	MW-X-DUP	Total/NA	Water	PFAS Prep	
MB 320-192344/1-A	Method Blank	Total/NA	Water	PFAS Prep	
LCS 320-192344/2-A	Lab Control Sample	Total/NA	Water	PFAS Prep	
460-143917-1 MS	MW-1	Total/NA	Water	PFAS Prep	
460-143917-1 MSD	MW-1	Total/NA	Water	PFAS Prep	

Analysis Batch: 192581

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-143917-1	MW-1	Total/NA	Water	WS-LC-0025 At1	192344
460-143917-2	MW-2R	Total/NA	Water	WS-LC-0025 At1	192344

LCMS (Continued)

Analysis Batch: 192581 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-143917-3	MW-3	Total/NA	Water	WS-LC-0025 At1	192344
460-143917-4	MW-4	Total/NA	Water	WS-LC-0025 At1	192344
460-143917-5	MW-5	Total/NA	Water	WS-LC-0025 At1	192344
460-143917-6	MW-6	Total/NA	Water	WS-LC-0025 At1	192344
460-143917-7	MW-7	Total/NA	Water	WS-LC-0025 At1	192344
460-143917-8	EB-PROBE	Total/NA	Water	WS-LC-0025 At1	192344
460-143917-9	EB-TUBING	Total/NA	Water	WS-LC-0025 At1	192344
460-143917-10	FB-X	Total/NA	Water	WS-LC-0025 At1	192344
460-143917-12	MW-X-DUP	Total/NA	Water	WS-LC-0025 At1	192344
MB 320-192344/1-A	Method Blank	Total/NA	Water	WS-LC-0025 At1	192344
LCS 320-192344/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025 At1	192344
460-143917-1 MS	MW-1	Total/NA	Water	WS-LC-0025 At1	192344
460-143917-1 MSD	MW-1	Total/NA	Water	WS-LC-0025 At1	192344

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: NY Standby - Oswego Castings 2017

TestAmerica Job ID: 460-143917-1

Client Sample ID: MW-1
Date Collected: 10/26/17 10:20
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C SIM		1	474310	11/03/17 14:09	SZD	TAL EDI
Total/NA	Prep	PFAS Prep			192344	11/01/17 10:41	TON	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1	192581	11/02/17 08:38	CBW	TAL SAC

Client Sample ID: MW-2R
Date Collected: 10/26/17 10:40
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C SIM		1	474310	11/03/17 14:55	SZD	TAL EDI
Total/NA	Prep	PFAS Prep			192344	11/01/17 10:41	TON	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1	192581	11/02/17 09:33	CBW	TAL SAC

Client Sample ID: MW-3
Date Collected: 10/26/17 14:10
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C SIM		1	473895	11/01/17 22:35	DAS	TAL EDI
Total/NA	Prep	PFAS Prep			192344	11/01/17 10:41	TON	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1	192581	11/02/17 09:51	CBW	TAL SAC

Client Sample ID: MW-4
Date Collected: 10/26/17 12:40
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C SIM		1	474310	11/03/17 15:18	SZD	TAL EDI
Total/NA	Prep	PFAS Prep			192344	11/01/17 10:41	TON	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1	192581	11/02/17 10:10	CBW	TAL SAC

Client Sample ID: MW-5
Date Collected: 10/26/17 09:25
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C SIM		1	474310	11/03/17 15:41	SZD	TAL EDI
Total/NA	Prep	PFAS Prep			192344	11/01/17 10:41	TON	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1	192581	11/02/17 10:28	CBW	TAL SAC

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: NY Standby - Oswego Castings 2017

TestAmerica Job ID: 460-143917-1

Client Sample ID: MW-6
Date Collected: 10/26/17 15:15
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C SIM		1	474310	11/03/17 16:04	SZD	TAL EDI
Total/NA	Prep	PFAS Prep			192344	11/01/17 10:41	TON	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1	192581	11/02/17 10:46	CBW	TAL SAC

Client Sample ID: MW-7
Date Collected: 10/26/17 17:15
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C SIM		1	474310	11/03/17 16:27	SZD	TAL EDI
Total/NA	Prep	PFAS Prep			192344	11/01/17 10:41	TON	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1	192581	11/02/17 11:23	CBW	TAL SAC

Client Sample ID: EB-PROBE
Date Collected: 10/26/17 11:30
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C SIM		1	473895	11/01/17 22:11	DAS	TAL EDI
Total/NA	Prep	PFAS Prep			192344	11/01/17 10:41	TON	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1	192581	11/02/17 11:41	CBW	TAL SAC

Client Sample ID: EB-TUBING
Date Collected: 10/26/17 15:20
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C SIM		1	474310	11/03/17 14:32	SZD	TAL EDI
Total/NA	Prep	PFAS Prep			192344	11/01/17 10:41	TON	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1	192581	11/02/17 12:00	CBW	TAL SAC

Client Sample ID: FB-X
Date Collected: 10/26/17 15:10
Date Received: 10/28/17 11:50

Lab Sample ID: 460-143917-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C SIM		1	474310	11/03/17 13:22	SZD	TAL EDI
Total/NA	Prep	PFAS Prep			192344	11/01/17 10:41	TON	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1	192581	11/02/17 12:18	CBW	TAL SAC

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: NY Standby - Oswego Castings 2017

TestAmerica Job ID: 460-143917-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 460-143917-11

Date Collected: 10/26/17 00:00

Matrix: Water

Date Received: 10/28/17 11:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C SIM		1	474310	11/03/17 13:45	SZD	TAL EDI

Client Sample ID: MW-X-DUP

Lab Sample ID: 460-143917-12

Date Collected: 10/26/17 00:00

Matrix: Water

Date Received: 10/28/17 11:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C SIM		1	474310	11/03/17 16:50	SZD	TAL EDI
Total/NA	Prep	PFAS Prep			192344	11/01/17 10:41	TON	TAL SAC
Total/NA	Analysis	WS-LC-0025 At1		1	192581	11/02/17 12:36	CBW	TAL SAC

Laboratory References:

TAL EDI = TestAmerica Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: ARCADIS U.S. Inc
Project/Site: NY Standby - Oswego Castings 2017

TestAmerica Job ID: 460-143917-1

Laboratory: TestAmerica Edison

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
New York	NELAP	2	11452	04-01-18

Laboratory: TestAmerica Buffalo

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
New York	NELAP	2	10026	03-31-18

Laboratory: TestAmerica Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
New York	NELAP	2	11666	04-01-18

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
WS-LC-0025 At1	PFAS Prep	Water	Perfluorobutanesulfonic acid (PFBS)
WS-LC-0025 At1	PFAS Prep	Water	Perfluoroheptanoic acid (PFHpA)
WS-LC-0025 At1	PFAS Prep	Water	Perfluorohexanesulfonic acid (PFHxS)
WS-LC-0025 At1	PFAS Prep	Water	Perfluorononanoic acid (PFNA)
WS-LC-0025 At1	PFAS Prep	Water	Perfluorooctanesulfonic acid (PFOS)
WS-LC-0025 At1	PFAS Prep	Water	Perfluorooctanoic acid (PFOA)

Method Summary

Client: ARCADIS U.S. Inc
Project/Site: NY Standby - Oswego Castings 2017

TestAmerica Job ID: 460-143917-1

Method	Method Description	Protocol	Laboratory
8260C SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL EDI
WS-LC-0025 At1	Perfluorinated Alkyl Substances	TAL-SAC	TAL SAC

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-SAC = TestAmerica Laboratories, West Sacramento, Facility Standard Operating Procedure.

Laboratory References:

TAL EDI = TestAmerica Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: ARCADIS U.S. Inc
Project/Site: NY Standby - Oswego Castings 2017

TestAmerica Job ID: 460-143917-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
460-143917-1	MW-1	Water	10/26/17 10:20	10/28/17 11:50
460-143917-2	MW-2R	Water	10/26/17 10:40	10/28/17 11:50
460-143917-3	MW-3	Water	10/26/17 14:10	10/28/17 11:50
460-143917-4	MW-4	Water	10/26/17 12:40	10/28/17 11:50
460-143917-5	MW-5	Water	10/26/17 09:25	10/28/17 11:50
460-143917-6	MW-6	Water	10/26/17 15:15	10/28/17 11:50
460-143917-7	MW-7	Water	10/26/17 17:15	10/28/17 11:50
460-143917-8	EB-PROBE	Water	10/26/17 11:30	10/28/17 11:50
460-143917-9	EB-TUBING	Water	10/26/17 15:20	10/28/17 11:50
460-143917-10	FB-X	Water	10/26/17 15:10	10/28/17 11:50
460-143917-11	TRIP BLANK	Water	10/26/17 00:00	10/28/17 11:50
460-143917-12	MW-X-DUP	Water	10/26/17 00:00	10/28/17 11:50

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica

FROM SYR: AFCs → SAC (FEDEX 414433909374), SIMs → EDISON (-9385).

Client Information	Sampler	Lab PM	Carrier Tracking No(s).	COC No
Client Contact: Jasmine Mullins	J MULLINS / K. LILOIA	Stone, Judy L		480-103774-24584.1
Company: ARCADIS U.S. Inc	Phone: 646-248-4208	E-Mail: judy.stone@testamericainc.com		Page: Page 1 of 2
Address: 855 Route 146 Suite 210	Due Date Requested:			Job #: 143917
City: Clifton Park	TAT Requested (days): STD.			
State, Zip: NY, 12065				
Phone: 518-250-7308(Tel) / 646-248-4208 (cell)	PO #: 00266404.0000			
Email: jasmine.mullins@arcadis.com	WO #:			
Project Name: NY Standby - Oswego Castings 2017	Project #: 48016948			
Site: Oswego Castings	SSOW#:			

Analysis Requested

460-143917 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Wwater, Ssolid, Owaste/oil, BT=Tissue, AirAir)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFAS_DI - PFAS, UCMR List	8260C_SIM - Volatile SIM	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	A		
MW-1	10/26/17	1020	G	Water	N	Y	6	9	15	MS/MSD 1
MW-2R	10/26/17	1040	G	Water	N	N	2	3	5	2
MW-3	10/26/17	1410	G	Water	N	N	2	3	5	3
MW-4	10/26/17	1240	G	Water	N	N	2	3	5	4
MW-5	10/27/17	0925	G	Water	N	N	2	3	5	5
MW-6	10/26/17	1515	G	Water	N	N	2	3	5	6
MW-7	10/26/17	1715	G	Water	N	N	2	3	5	7
EB-PROBE	10/26/17	1130	G	Water	N	N	2	3	5	8
EB-TUBING	10/26/17	1520	G	Water	N	N	2	3	5	9
FB-X	10/26/17	1510	G	Water	N	N	2	3	5	10
TRIP BLANK	10/26/17	—	G	Water	N	N		2	2	11

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	[signature]	10/27/17 11:40	ARCADIS	[signature] FEDEX SAT DEL	10/27/17, 11:40	Syr
2	[signature]	10/27/17, 19:10	Syr	[signature]	10/28/2017 11:50	TA Edi
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: NO CS

Cooler Temperature(s) °C and Other Remarks: 0.3°C IR#9

Ver. 08/04/2016

483225 - Syracuse SC

11/10/2017

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TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica

11/10/2017

Client Information	Sampler:	Lab PM: Stone, Judy L	Carrier Tracking No(s):	COC No: 480-103774-24584.2
Client Contact: Jasmine Mullins	Phone:	E-Mail: judy.stone@testamericainc.com		Page: Page 2 of 2
Company: ARCADIS U.S. Inc				Job #: 143917
Address: 855 Route 146 Suite 210	Due Date Requested:			
City: Clifton Park	TAT Requested (days):			
State, Zip: NY, 12065				
Phone: 518-250-7308(Tel)	PO #: 00266404.0000			
Email: jasmine.mullins@arcadis.com	WO #:			
Project Name: NY Standby - Oswego Castings 2017	Project #: 48016948			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCl	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Wwwater, Ssolid, Owaste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFAS_DI - PFAS, UCMR List	8260C_SIM - Volatile SIM	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	A		
MW-X-DUP	10/26/17	—	G	Water	N	N	23		5	12
				Water						

RE 10-27-17

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	[signature]	10/27/17, 11:40	ARCADIS	RE 11/1b	10-27-17, 11:40	Pyr
2	RE 11/1b	10-27-17, 16:02	Pyr	[signature] FEDEX GMT DEV	10/28/2017, 1150	TA edi
3	Relinquished by:	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.: NO CY	Cooler Temperature(s) °C and Other Remarks: 0.3°C IR#9

Ver: 08/04/2016

483325 - Syracuse SC

TestAmerica Edison
Receipt Temperature and pH Log

Job Number: 143917

Number of Coolers: 1 IR Gun # 9

Cooler Temperatures

	RAW	CORRECTED		RAW	CORRECTED		RAW	CORRECTED
Cooler #1:	0.3 °C	0.3 °C	Cooler #4:	°C	°C	Cooler #7:	°C	°C
Cooler #2:	°C	°C	Cooler #5:	°C	°C	Cooler #8:	°C	°C
Cooler #3:	°C	°C	Cooler #6:	°C	°C	Cooler #9:	°C	°C

TALS Sample Number	Ammonia (pH<2)	COD (pH<2)	Nitrate Nitrite (pH<2)	Metals* (pH<2)	Hardness (pH<2)	Pest (pH 5-9)	EPH or QAM (pH<2)	Phenols (pH<2)	Sulfide (pH>9)	TKN (pH<2)	TOC (pH<2)	Total Cyanide (pH>12)	Total Phos (pH<2)	Other	Other

If pH adjustments are required record the information below:

Sample No(s). adjusted: _____

Preservative Name/Conc.: _____ Volume of Preservative used (ml): _____

Lot # of Preservative(s): _____ Expiration Date: _____

The appropriate Project Manager and Department Manager should be notified about the samples which were pH adjusted.

** Samples for Metal analysis which are out of compliance must be acidified at least 24 hours prior to analysis.*

Initials: _____ Date: 10/28/2017

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica LABORATORIES, INCORPORATED

FROM SYR: AFCs → SAC (FEDEX 414431909374), SIMs → EDISON (-9385).

Client Information	Sampler: J.MULLINS / K.LILOIA	Lab PM: Stone, Judy L	Carrier Tracking No(s):	COC No: 480-103774-24584.1
Client Contact: Jasmine Mullins	Phone: 646-248-4208	E-Mail: judy.stone@testamericainc.com		Page: Page 1 of 2
Company: ARCADIS U.S. Inc				Job #:
Address: 855 Route 146 Suite 210	Due Date Requested:			
City: Clifton Park	TAT Requested (days): STD.			
State, Zip: NY, 12065				
Phone: 518-250-7308(Tel) / 646-248-4208 (cell)	PO #: 00266404.0000			
Email: jasmine.mullins@arcadis.com	WO #:			
Project Name: NY Standby - Oswego Castings 2017	Project #: 48016948			
Site: Oswego Castings	SSOW#:			

Analysis Requested

460-143917 Chain of Custody

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFAS_DI - PFAS, UCMR List	8260C_SIM - Volatile SIM	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	A		
MW-1	10/26/17	1020	G	Water	N	Y	6	9	15	MS/MSD
MW-2R	10/26/17	1040	G	Water	N	N	2	3	5	
MW-3	10/26/17	1410	G	Water	N	N	2	3	5	
MW-4	10/26/17	1240	G	Water	N	N	2	3	5	
MW-5	10/27/17	0925	G	Water	N	N	2	3	5	
MW-6	10/26/17	1515	G	Water	N	N	2	3	5	
MW-7	10/26/17	1715	G	Water	N	N	2	3	5	
EB-PROBE	10/26/17	1130	G	Water	N	N	2	3	5	
EB-TUBING	10/26/17	1520	G	Water	N	N	2	3	5	
FB-X	10/26/17	1510	G	Water	N	N	2	3	5	
TRIP BLANK	10/26/17	—	G	Water	N	N		2	2	

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☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	10/27/17 11:40	ARCADIS	[signature]	10/27/17, 11:40	S yra
[signature]	10.27.17, 19:00	S yra	[signature]	10/28/17 1130	TAWS
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: △ Yes △ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 08/04/2016

TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler:	Lab PM: Stone, Judy L	Carrier Tracking No(s):	COC No: 480-103774-24584.2
Client Contact: Jasmine Mullins	Phone:	E-Mail: judy.stone@testamericainc.com		Page: Page 2 of 2
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State, Zip: NY, 12065				
Phone: 518-250-7308(Tel)	PO #: 00266404.0000			
Email: jasmine.mullins@arcadis.com	WO #:			
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Site:	SSOW#:			

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			Preservation Code:				N	A		
MW-X-DUP	10/26/17	—	G	Water	N	N	2	3	5	
				Water						

RC
10:27 17

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	[signature]	10/27/17, 11:40	ARCADIS	RECEIVED	10-27-17, 11:40	Tyr
2	RECEIVED	10:27-17, 16:05	Tyr	[signature]	10/28/17 1130	TAWS
3						

Custody Seals Intact: △ Yes △ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Ver: 08/04/2016

Login Sample Receipt Checklist

Client: ARCADIS U.S. Inc

Job Number: 460-143917-1

Login Number: 143917
List Number: 1
Creator: Jara, Kelly D

List Source: TestAmerica Edison

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: ARCADIS U.S. Inc

Job Number: 460-143917-1

Login Number: 143917
List Number: 2
Creator: Jara, Kelly D

List Source: TestAmerica Edison

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time (Excluding tests with immediate HTs)..		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Sampling Company provided.		
Samples received within 48 hours of sampling.		
Samples requiring field filtration have been filtered in the field.		
Chlorine Residual checked.		

Login Sample Receipt Checklist

Client: ARCADIS U.S. Inc

Job Number: 460-143917-1

Login Number: 143917
List Number: 3
Creator: Turpen, Troy

List Source: TestAmerica Sacramento
List Creation: 10/30/17 08:49 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.8 °C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	