2015 Annual Operations, Maintenance, and Monitoring Report

Olin Niagara Falls Plant
Niagara Falls, New York

Prepared for:

OLIN CORPORATION

Prepared by:

Amec Foster Wheeler Environment & Infrastructure, Inc.
1075 Big Shanty Road NW, Suite 100
Kennesaw, Georgia 30144

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ABBREVIATIONS AND ACRONYMS

Acronym	Definition
ARGC	Alundum Road – Gill Creek
BHC	Benzene hexachloride
GWTS	Groundwater Treatment System
HG	mercury
NYSDEC	New York State Department of Environmental Conservation
Olin	Olin Corporation
Order	Administrative Order on Consent
PR	Passive Relief
RW	Recovery Well
VOC	volatile organic compounds

1.0 INTRODUCTION

As required by the Administrative Order on Consent (Order) #R9-4171-94-08 between New York State Department of Environmental Conservation (NYSDEC) and Olin Corporation (Olin), Olin has implemented a Remedial Plan to address groundwater contamination at Plant 2, in Niagara Falls, New York. In accordance with the Remedial Plan, a Groundwater Treatment System (GWTS) was installed at the site in 1998 and has been operated since that time. The goals of the GWTS are to reduce the concentration of Olin-derived constituents in the site groundwater and restrict off-site migration of these constituents. The Olin-derived constituents are defined in the Remedial Plan and include aromatic compounds, benzene hexachlorides (BHCs), and mercury.

The Remedial Plan also requires periodic reporting of groundwater quality and groundwater elevation information collected during the operations of the GWTS. This Annual Operations, Maintenance, and Monitoring Report covers the period from January 1, 2015 through December 31, 2015. The 2014 Annual Operations, Maintenance, and Monitoring Report was approved by NYSDEC in their June 18, 2015 letter. This letter as well as other correspondence pertaining to the Order with NYSDEC in 2015 are included in Appendix A.

The GWTS was operated and maintained effectively in 2015. The GWTS operations resulted in effective hydraulic capture of A-zone and B-zone groundwater as well as continued mass removal of VOCs, pesticides, and mercury. Site constituent concentrations and distribution are consistent with historical monitoring data indicating effective hydraulic control. Additionally, continued operation of Olin's process water production well has provided hydraulic control of the C and CD-Zones. Overall, the GWTS system is achieving the objectives established in the Order and Remedial Plan.

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2.0 OPERATIONS AND MAINTENANCE

The GWTS operated with an average run time of approximately 76% in 2015. Table 2.1 shows the run time and down time for each month in 2015. Downtimes throughout the year were caused by:

- Inclement weather
- General equipment maintenance and repairs
- Pitless adapter repair and replacement at recovery well (RW) 5 (February)
- Carbon change outs in February and December
- Well redevelopment
- Scheduled plant maintenance shutdown (March)

Details of the routine maintenance tasks and troubleshooting are included for this reporting period in the weekly reports from Olin's contractor, Sevenson Environmental Services (**Appendix B**). The weekly O&M reports document measurement of RW flow rates, RW water elevations, other system parameters, and maintenance conducted.

3.0 GWTS PERFORMANCE

Figures 3.1 through 3.8 show the RW flow rates and water elevations throughout 2015. Flow rates and water elevations were consistent with historic values. Total monthly flows for 2015 are presented on Table 3.1.

Tables 3.2 through 3.5 show RW header concentrations and mass removal for each quarter of 2015. Table 3.6 shows the mass removed over the operational life of the GWTS. The total volume of groundwater extracted since GWTS startup is approximately 426 million gallons. Approximately 7.7 million gallons were extracted in 2015. The GWTS has extracted over 102,000 pounds of volatile organic compounds (VOCs), 437 pounds of pesticides (BHCs), and approximately 7.6 pounds of mercury from operations starting December 1997 through 2015.

Figures 3.9 through 3.11 present graphs that show the treatment system loading rates for VOCs, BHCs, and mercury over the history of operation. The VOC and BHC loading rates have remained relatively steady over the GWTS operational period while the mercury loading rate has shown an overall decreasing trend.

Figures 3.12 through 3.14 show annual mass removal compared to annual groundwater removal throughout the operations. Mercury mass removal has generally decreased over the system operations. BHC and aromatic VOC mass removal has been steady regardless of groundwater extraction rate. Aliphatic VOC mass removal has generally increased over the system operations, but has decreased since 2012 and is a function of the total volume of groundwater extracted. The aliphatic mass removal appears to be influenced by the groundwater removal rate more than the other constituents and is more efficient at lower groundwater extraction rates (e.g., there is less dilution).

Historically, most of the VOCs removed by the Olin treatment system are aliphatic constituents (95% overall and 93% in 2015) that originate off-site from the Chemours facility.

Tables 3.7 through 3.10 show GWTS treatment performance results. These performance data are used to optimize system performance and schedule change out of activated carbon. Based on these data, the activated carbon was replaced on February 11, 2015 and December 11, 2015.

4.0 HYDRAULIC ANALYSIS

Groundwater level measurements were collected quarterly in 2015. Tables 4.1 through 4.4 present the quarterly water elevations for the monitored zones at the site. The water elevations were used to interpret the potentiometric surface at the site and evaluate groundwater capture.

4.1 A-ZONE

Figures 4.1 through 4.4 show the interpreted A-Zone potentiometric surface (April, June, September, and December) for each quarter of 2015. These figures show A-zone capture in the Alundum Road-Gill Creek (ARGC) area by Olin's recovery wells and passive relief wells. A-zone groundwater flow is toward the passive relief wells which drain the A-zone groundwater to the B-zone and since potentiometric heads in the B-zone are below Gill Creek, the passive relief wells are effective in preventing groundwater flow to Gill Creek.

The yellow highlighted areas represent areas that are estimated to be dewatered as defined by the bottom elevation of the A-zone. The dewatered areas also show that the A-zone is being effectively drained to the B-zone. The corresponding table shows which wells had water level elevations that were below the physical bottom of the A-zone. In cases where the A zone was dewatered, the physical bottom of the fracture system was used in the interpreted potentiometric surface.

4.2 B-ZONE

Figures 4.5 through 4.8 show B-Zone potentiometric surface maps for each quarter of 2015. The B-Zone potentiometric surface maps show hydraulic capture of the B-zone on Olin property by Olin pumping wells and Solvent pumping wells located on Olin property (PW-3B and PW-4B. The greater drawdown observed in Solvent pumping well PW-3B creates a gradient that dominates local B-zone flow on Olin property. Additionally, groundwater elevations at PN-24B consistently show an inward gradient from Buffalo Avenue towards the site.

Two wells, PN18B and PN-19B, showed unusually high water levels, compared to historical values, at different times during 2015. The measurements were included in the potentiometric interpretation, but result in interpreted groundwater mounds that are not likely accurate representations of the confined groundwater system and conditions at these locations. Similar high potentiometric levels have been noted historically in some PR wells as a result of fouling of

the water bearing fractures in the B-zone. Regardless of these data points, the interpreted potentiometric surface over all still demonstrates hydraulic capture of the impacted B-zone groundwater. Olin will continue to evaluate these data points in the future.

4.3 C-ZONE

Figures 4.9 through 4.12 show C-Zone potentiometric surface maps for each quarter of 2015. The C-Zone figures generally show flow to the west toward the Olin production well but also a low at OBA-7C. The elevations and contouring are consistent with historic C-zone pot maps.

4.4 CD-ZONE

Figures 4.13 through 4.16 show CD-Zone potentiometric surface maps for each quarter of 2015. CD-zone hydraulic gradients indicate southwestward flow toward the Olin production well and OBA-8C in Plant 1.

5.0 GROUNDWATER QUALITY

Site groundwater quality is monitored annually. Samples were collected from the site monitoring wells June 17 through June 30, 2015. Table 5.1 provides the analytical results. Figures 5.1 through 5.8 show the constituent distributions for the following indicator parameters in the A and B-Zones:

- 1,2,4-Trichlorobenzene - Aromatic
- Trichloroethene – Aliphatic
- Gamma-BHC – Pesticide
- Total Mercury - Mercury

The figures show that constituent concentrations and distribution are consistent with historical site monitoring data.

6.0 CONCLUSIONS

The GWTS was operated and maintained effectively in 2015. The system runtime averaged 76% for 2015. The GWTS operations resulted in effective hydraulic capture of A-zone and B-zone groundwater as well as continued mass removal of VOCs, pesticides, and mercury. Site constituent concentrations and distribution are consistent with historical monitoring data which suggests continuing effective hydraulic control. Additionally, continued operation of Olin's process water production well has provided hydraulic control of the C and CD-Zones. Overall, the GWTS system is achieving the objectives established in the Order and Remedial Plan.

TABLES

Table 2.1: 2015 Monthly Runtime Summary

	RW-1			RW-2			RW-3			RW-4		
Month	**Downtime (hours)**	**Runtime (hours)**	**Runtime %**	**Downtime (hours)**	**Runtime (hours)**	**Runtime %**	**Downtime (hours)**	**Runtime (hours)**	**Runtime %**	**Downtime (hours)**	**Runtime (hours)**	**Runtime %**
January 2015	228.6	515.4	69%	225.8	518.2	70%	228.8	515.2	69%	230.0	514.0	69%
February 2015	353.7	318.3	47%	187.6	484.4	72%	157.9	514.1	77%	145.1	526.9	78%
March 2015	342.3	401.8	54%	206.3	537.7	72%	182.5	561.5	75%	168.8	575.2	77%
April 2015	389.7	330.3	46%	268.1	451.9	63%	365.5	354.5	49%	228.6	491.4	68%
May 2015	109.3	634.7	85%	29.3	714.8	96%	66.3	677.7	91%	51.5	692.5	93%
June 2015	55.4	664.6	92%	46.5	673.5	94%	63.7	656.3	91%	59.7	660.3	92%
July 2015	32.7	711.3	96%	24.9	719.1	97%	25.3	718.8	97%	25.0	719.0	97%
August 2015	70.8	673.2	90%	64.3	679.8	91%	67.8	676.3	91%	188.8	555.3	75%
September 2015	92.1	627.9	87%	80.4	639.6	89%	42.8	677.2	94%	720.0	0.0	0%
October 2015	190.8	553.2	74%	175.7	568.3	76%	210.8	533.2	72%	744.0	0.0	0%
November 2015	287.3	432.8	60%	288.2	431.8	60%	292.6	427.4	59%	303.9	416.1	58%
December 2015	257.3	486.7	65%	291.2	452.8	61%	303.2	440.8	59%	301.5	442.5	59%
Total	**2409.9**	**6350.1**	**72.5%**	**1888.2**	**6871.8**	**78.4%**	**2007.2**	**6752.8**	**77.1%**	**3166.8**	**5593.2**	**63.8%**

Table 2.1: 2015 Monthly Runtime Summary

	RW-5			PR-4			PR-12			OBA-9AR		
Month	**Downtime (hours)**	**Runtime (hours)**	**Runtime %**	**Downtime (hours)**	**Runtime (hours)**	**Runtime %**	**Downtime (hours)**	**Runtime (hours)**	**Runtime %**	**Downtime (hours)**	**Runtime (hours)**	**Runtime %**
January 2014	744.0	0.0	0%	36.3	707.7	95%	68.8	675.2	91%	127.3	616.7	83%
February 2014	543.4	128.6	19%	155.5	516.5	77%	150.5	521.5	78%	251.6	420.4	63%
March 2014	670.3	73.7	10%	165.8	578.3	78%	165.0	579.0	78%	165.3	578.8	78%
April 2014	404.0	316.0	44%	196.9	523.1	73%	86.3	633.8	88%	82.0	638.0	89%
May 2014	309.6	434.4	58%	32.0	712.0	96%	43.0	701.0	94%	40.1	703.9	95%
June 2014	90.6	629.4	87%	57.8	662.3	92%	69.5	650.5	90%	80.8	639.2	89%
July 2014	28.8	715.3	96%	3.8	740.3	99%	25.3	718.7	97%	2.1	741.9	100%
August 2014	53.8	690.3	93%	67.5	676.5	91%	67.4	676.6	91%	0.0	744.0	100%
September 2014	28.7	691.3	96%	66.1	653.9	91%	59.3	660.8	92%	0.0	720.0	100%
October 2014	191.3	552.7	74%	127.2	616.8	83%	154.3	589.8	79%	0.0	744.0	100%
November 2014	286.6	433.4	60%	307.8	412.2	57%	201.6	518.4	72%	0.0	720.0	100%
December 2014	304.8	439.2	59%	212.0	532.0	72%	57.4	686.6	92%	0.0	744.0	100%
Total	**3655.8**	**5104.2**	**58.3%**	**1428.6**	**7331.4**	**83.7%**	**1148.3**	**7611.7**	**86.9%**	**749.2**	**8010.8**	**91.4%**

Prepared By: A. Nelson 02/29/2016
Checked By: S. Gallagher 03/02/2016

Table 3.1: Summary of Total Flow and Average System Flow Rates for 2015

Period	Average Flow Rate (gpm)								
	RW-1	RW-2	RW-3	RW-4	PR-4	RW-5	PR-12	OBA-9AR	Total
January-15	0.8	3.7	0.8	0.4	1.8	-	3.2	0.7	11.3
February-15	0.6	4.1	0.6	0.5	1.4	-	3.7	0.5	11.5
March-15	0.5	5.2	0.5	0.5	1.4	0.7	3.8	0.4	13.1
1st Qtr 15									
April-15	0.3	3.4	0.3	0.4	1.5	2.0	2.5	0.5	11.3
May-15	1.0	5.8	0.5	0.5	2.4	0.1	4.6	0.5	15.6
June-15	1.3	6.9	0.4	0.5	2.3	0.2	4.1	0.6	16.4
2ndQtr 15									
July-15	1.9	7.6	0.4	0.4	2.4	0.2	3.5	0.6	17.1
August-15	2.8	5.2	0.3	0.2	2.2	1.6	4.1	0.6	16.8
September-15	2.5	5.2	0.3	-	2.3	5.4	3.9	0.7	20.3
3rdQtr 15									
October-15	2.0	4.3	0.2	-	2.2	4.2	3.6	0.6	17.2
November-15	1.6	3.0	0.1	0.9	1.2	3.4	2.7	0.6	13.4
December-15	1.5	2.1	0.1	1.0	1.3	3.1	2.4	0.6	12.2
4thQtr 15									
Maximum	**2.8**	**7.6**	**0.8**	**1.0**	**2.4**	**5.4**	**4.6**	**0.7**	**20.3**
Average	**1.4**	**4.7**	**0.4**	**0.5**	**1.9**	**2.1**	**3.5**	**0.6**	**14.7**
2015 System Total									

Table 3.1: Summary of Total Flow and Average System Flow Rates for 2015

Period	Total Flow (gal/month)	Total Quarterly Flow (gal)	Flow Contribution Per Well (gal/month)							
			RW-1	RW-2	RW-3	RW-4	PR-4	RW-5	PR-12	OBA-9AR
January-15	502,829		34,892	163,748	33,489	18,835	80,632	-	140,753	30,479
February-15	463,517		24,947	167,052	25,563	21,274	57,853	-	147,962	18,866
March-15	586,523		24,066	232,648	23,412	23,708	62,952	33,127	168,853	17,757
1st Qtr 15		**1,552,869**								
April-15	486,754		24,758	146,407	13,573	17,423	66,856	86,292	107,998	23,448
May-15	695,291		45,449	258,915	24,097	22,793	108,577	6,488	206,167	22,806
June-15	708,613		56,446	302,962	19,336	19,626	97,884	7,623	180,137	24,599
2ndQtr 15		**1,890,659**								
July-15	789,002		86,481	340,829	15,937	18,048	107,328	8,633	184,460	27,288
August-15	750,862		123,341	230,135	12,092	9,194	96,032	71,798	181,159	27,110
September-15	876,980		106,909	225,013	13,683	-	98,948	234,117	169,042	29,269
3rdQtr 15		**2,416,844**								
October-15	766,039		91,353	193,576	8,942	-	96,697	188,476	158,999	27,995
November-15	576,818		67,071	127,453	6,182	38,693	50,922	145,434	116,777	24,286
December-15	546,159		68,060	93,226	4,582	45,863	58,704	137,350	109,367	29,008
4thQtr 15		**1,889,016**								
Maximum	**876,980**	**2,416,844**	**123,341**	**340,829**	**33,489**	**45,863**	**108,577**	**234,117**	**206,167**	**30,479**
Average	**645,782**	**1,937,347**	**62,814**	**206,830**	**16,741**	**23,546**	**81,949**	**91,934**	**155,973**	**25,242**
2015 System Total	**7,749,387**		**753,773**	**2,481,964**	**200,888**	**235,456**	**983,384**	**919,338**	**1,871,674**	**302,910**

Prepared by: T. Donnell 01/12/2016
Checked by: A. Nelson 01/13/2016

Table 3.2: March, 24 2015 Recovery Well Header Concentrations and 1st Quarter 2015 Mass Removal

Well ID: / Sample Date:	Sample RW-1 3/24/2015	Sample RW-2 3/24/2015	Sample RW-3 3/24/2015	Sample RW-4 3/24/2015	Sample PR-4 3/24/2015	Sample RW-5 3/24/2015	Sample PR-12 3/24/2015	Sample OBA-9AR 3/24/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L								
Aliphatic Compounds								
1,1,1-Trichloroethane	25 U	2.5 U	1.0 U	20 U	20 U	250 U	1000 U	220
1,1,2,2-Tetrachloroethane	25 U	17	2.0	20 U	20 U	5800	8100	2300
1,1,2-Trichloroethane	25 U	2.5 U	1.0 U	20 U	20 U	250 U	1000 U	150
1,1-Dichloroethene	25 U	2.5 U	1.0 U	20 U	20 U	250 U	1000 U	110
Carbon tetrachloride	25 U	2.5 U	1.0 U	20 U	20 U	250 U	1000 U	44
Chloromethane (Methyl chloride)	25 U	2.5 U	1.0 U	20 U	20 U	250 U	1000 U	20 U
cis-1,2-Dichloroethene	67	180	21	910	1500	7500	6600	2400
Methylene chloride (Dichloromethane)	25 U	2.5 U	1.0 U	20 U	20 U	610	1500	20 U
Tetrachloroethene (PCE)	130	210	29	370	470	29000	39000	8800
trans-1,2-Dichloroethene	25 U	2.5 U	1.0 U	20 U	20 U	250 U	1000 U	130
Trichloroethene (TCE)	230	380	38	600	750	36000	95000	57000
Vinyl Chloride	25 U	4.6	1.3	100	180	860	1000 U	240
Aromatic Compounds								
1,2,4-Trichlorobenzene	3100	14	41	2400	3900	1800	4900	8300
1,2-Dichlorobenzene	230	2.5 U	2.1	60	98	300	1100	7500
1,3-Dichlorobenzene	320	5.7	12	400	670	250 U	1000 U	1100
1,4-Dichlorobenzene	190	3.9	8.7	290	490	440	1100	6900
Benzene	25 U	2.5 U	1.0 U	82	150	250 U	1000 U	370
Chlorobenzene	110	2.5 U	2.0	140	230	250 U	1000 U	660
Pesticide Concentrations - SW846 8081 µg/L								
alpha-BHC	10	1	2.0	75	180	140	240	330
beta-BHC	6.6	0.26	1.1	4.7	14	12	29	30
delta-BHC	0.47 U	0.12	3.3	6.8	14	9	16	24
gamma-BHC (Lindane)	0.47 U	0.63	3.3	67	160	95	190	220
Total Metal Concentrations - SW846 7470 µg/L								
Mercury	82.5	0.48	0.23	2.46	0.47	0.46	0.20 U	0.20 U
Total Flow 1st Quarter 2015 - gallons								
Flow	83,906	563,448	82,464	63,817	201,437	33,127	457,568	67,101
Total Mass Removed 1st Quarter 2015 - pounds								
Aliphatic Compounds	**0.3**	**3.7**	**0.1**	**1.1**	**4.9**	**22.1**	**575.8**	**40.1**
Aromatic Compounds	**2.8**	**0.1**	**0.0**	**1.8**	**9.3**	**0.7**	**27.2**	**14.0**
Pesticides	**0.01**	**0.01**	**0.01**	**0.08**	**0.62**	**0.07**	**1.82**	**0.34**
Mercury	**0.05799**	**0.00227**	**0.00016**	**0.00132**	**0.00079**	**0.00013**	**0.00000**	**0.00000**

Notes:

U - constituent not detected - reporting limit shown.
ug/L - micrograms per liter
mg/L - milligrams per liter

Prepared by: R. Yardley 06/10/2015
Checked by: A. Nelson 07/30/2015

Table 3.3: June 16, 2015 Recovery Well Header Concentrations and 2nd Quarter 2015 Mass Removal

Well ID: / Sample Date:	Sample RW-1 6/16/2015	Sample RW-2 6/16/2015	Sample RW-3 6/16/2015	Sample RW-4 6/16/2015	Sample PR-4 6/16/2015	Sample RW-5 6/16/2015	Sample PR-12 6/16/2015	Sample OBA-9AR 6/16/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L								
Aliphatic Compounds								
1,1,1-Trichloroethane	25 U	2.5 U	1.0 U	20 U	20 U	500 U	250 U	250 U
1,1,2,2-Tetrachloroethane	25 U	14	1.6	270	94	16000	2200	4500
1,1,2-Trichloroethane	25 U	2.5 U	1.0 U	20 U	20 U	500 U	250 U	250 U
1,1-Dichloroethene	25 U	2.5 U	1.0 U	20 U	20 U	500 U	250 U	250 U
Carbon tetrachloride	25 U	2.5 U	1.0 U	20 U	20 U	800	250 U	250 U
Chloromethane (Methyl chloride)	25 U	2.5 U	1.0 U	20 U	20 U	500 U	250 U	250 U
cis-1,2-Dichloroethene	760	170	3.7	590	3200	10000	2700	3700
Methylene chloride (Dichloromethane)	51	2.5 U	1.0 U	31	20 U	2300	250 U	310
Tetrachloroethene (PCE)	1800	160	20	1200	1100	52000	13000	17000
trans-1,2-Dichloroethene	25 U	2.8	1.0 U	20 U	27	500 U	250 U	250 U
Trichloroethene (TCE)	5600	390	26	3200	3100	190000	40000	45000
Vinyl Chloride	29	2.9	1.0 U	37	220	1300	380	380
Aromatic Compounds								
1,2,4-Trichlorobenzene	6500	37	5.8	700	3400	4200	3200	5000
1,2-Dichlorobenzene	180	2.5 U	1.0 U	27	120	560	330	1600
1,3-Dichlorobenzene	260	2.9	1.0 U	82	510	500 U	320	410
1,4-Dichlorobenzene	130	2.5 U	1.0 U	54	390	610	1000	1600
Benzene	54	2.5 U	1.0 U	20 U	110	630	250 U	250 U
Chlorobenzene	93	2.5 U	1.0 U	24	160	730	310	290
Pesticide Concentrations - SW846 8081 µg/L								
alpha-BHC	36	0.13	0.21	51	170	220	140	190
beta-BHC	3.6	0.19	0.84	4.7 U	13	23	18	24 U
delta-BHC	2.4 U	0.0047 U	0.14	4.7 U	17	14	12 U	24 U
gamma-BHC (Lindane)	2.4 U	0.083	0.071	46	170	160	130	160
Total Metal Concentrations - SW846 7470 µg/L								
Mercury	46.4	0.20 U	0.81	1.77	1.79	1.07	0.21	0.42
Total Flow 2nd Quarter 2015 - gallons								
Flow	126,653	708,284	57,005	59,841	273,316	100,403	494,302	70,853
Total Mass Removed 1st Quarter 2015 - pounds								
Aliphatic Compounds	**8.7**	**4.4**	**0.02**	**2.7**	**17.7**	**229.1**	**241.3**	**42.1**
Aromatic Compounds	**7.7**	**0.2**	**0.003**	**0.4**	**10.7**	**5.7**	**21.4**	**5.3**
Pesticides	**0.04**	**0.002**	**0.001**	**0.05**	**0.8**	**0.4**	**1.2**	**0.2**
Mercury	**0.05**	**0.001**	**0.0004**	**0.0009**	**0.004**	**0.0009**	**0.0009**	**0.0002**

Notes:

U - constituent not detected - reporting limit shown.
ug/L - micrograms per liter

Prepared by: S. Gallagher 09/10/2015
Checked by: T. Englund 09/10/2015

Table 3.4: October 6, 2015 Recovery Well Header Concentrations and 3rd Quarter 2015 Mass Removal

Well ID: / Sample Date:	Sample RW-1 10/6/2015	Sample RW-2 10/6/2015	Sample RW-3 10/6/2015	Sample RW-4 10/6/2015	Sample PR-4 10/6/2015	Sample RW-5 10/6/2015	Sample PR-12 10/6/2015	Sample OBA-9AR 10/6/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L								
Aliphatic Compounds								
1,1,1-Trichloroethane	100 U	2.0 U	2.5 U	5.0 U	50 U	1000 U	100 U	200 U
1,1,2,2-Tetrachloroethane	100 U	12	12	5.0 U	100	11000	780	1100
1,1,2-Trichloroethane	100 U	2.0 U	2.5 U	5.0 U	50 U	1000 U	100 U	200 U
1,1-Dichloroethene	100 U	2.0 U	2.5 U	5.0 U	50 U	1000 U	100 U	200 U
Carbon tetrachloride	100 U	2.0 U	2.5 U	5.0 U	50 U	1000 U	100 U	200 U
Chloromethane (Methyl chloride)	100 U	2.0 U	2.5 U	5.0 U	50 U	1000 U	100 U	200 U
cis-1,2-Dichloroethene	2300	86	85	6.1	5200	8200	2100	2000
Methylene chloride (Dichloromethane)	700	2.0 U	6.9	5.0 U	50	1600	100 U	200 U
Tetrachloroethene (PCE)	4700	120	120	5.0 U	860	38000	5300	6400
trans-1,2-Dichloroethene	100 U	2.0 U	2.5 U	5.0 U	50 U	1000 U	100 U	200 U
Trichloroethene (TCE)	16000	230	280	5.0 U	1900	100000	15000	18000
Vinyl Chloride	160	2.0 U	2.5	5.0 U	300	1000	100	200 U
Aromatic Compounds								
1,2,4-Trichlorobenzene	6500	3.5	47	330	3700	3900	3100	3400
1,2-Dichlorobenzene	200	2.0 U	2.6	27	140	1000 U	1600	1800
1,3-Dichlorobenzene	310	2.0 U	4.8	810	690	1000 U	480	500
1,4-Dichlorobenzene	190	2.0 U	4.4	730	570	1000 U	1600	1800
Benzene	320	2.0 U	3.3	5.0 U	120	1000 U	180	200 U
Chlorobenzene	260	2.0 U	2.8	570	240	1000 U	250	250
Pesticide Concentrations - SW846 8081 µg/L								
alpha-BHC	32	0.1	0.85	91	150	180	120	140
beta-BHC	4.1	0.12	1.10	4.7 U	11	13	13	13
delta-BHC	0.96 U	0.048 U	3.1	4.8 U	15	12	9.6 U	9.6 U
gamma-BHC (Lindane)	1.2	0.078	1.4	12	130	140	100	97
Total Metal Concentrations - SW846 7470 µg/L								
Mercury	6.15	0.20 U	0.20 U	0.20 U	0.25	0.31	0.24	0.20 U
Total Flow 3rd Quarter 2015 - gallons								
Flow	316,731	795,977	41,712	27,242	302,308	314,548	534,661	83,667
Total Mass Removed 3rd Quarter 2015 - pounds								
Aliphatic Compounds	**63.3**	**3.0**	**0.18**	**0.0**	**21.3**	**421.1**	**104.3**	**19.3**
Aromatic Compounds	**20.6**	**0.0**	**0.023**	**0.6**	**13.8**	**10.3**	**32.3**	**5.4**
Pesticides	**0.10**	**0.002**	**0.002**	**0.02**	**0.8**	**0.9**	**1.0**	**0.2**
Mercury	**0.02**	**0.001**	**0.0001**	**0.0000**	**0.001**	**0.0008**	**0.0011**	**0.0000**

Notes:

U - constituent not detected - reporting limit shown.
ug/L - micrograms per liter

Prepared by: T. Donnell 12/02/2015
Checked by: T. Englund 12/02/2015

Table 3.5: December 15, 2015 Recovery Well Header Concentrations and 4th Quarter 2015 Mass Removal

Well ID: / Sample Date:	Sample RW-1 12/15/2015	Sample RW-2 12/15/2015	Sample RW-3 12/15/2015	Sample RW-4 12/15/2015	Sample PR-4 12/15/2015	Sample RW-5 12/15/2015	Sample PR-12 12/15/2015	Sample OBA-9AR 12/15/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L								
Aliphatic Compounds								
1,1,1-Trichloroethane	100 U	2.5 U	2.0 U	5.0 U	25 U	1000 U	500 U	250 U
1,1,2,2-Tetrachloroethane	100 U	18	24	22.0	97	14000	7100	1300
1,1,2-Trichloroethane	100 U	2.5 U	2.0 U	5.0 U	25 U	1000 U	500 U	250 U
1,1-Dichloroethene	100 U	2.5 U	2.0 U	5.0 U	25 U	1000 U	500 U	250 U
Carbon tetrachloride	100 U	2.5 U	2.0 U	5.0 U	25 U	1000 U	500 U	250 U
Chloromethane (Methyl chloride)	100 U	2.5 U	2.0 U	5.0 U	25 U	1000 U	500 U	250 U
cis-1,2-Dichloroethene	2000	260	130	770	3900	10000	4900	1300
Methylene chloride (Dichloromethane)	350	2.5 U	2.0 U	5.0 U	25 U	1900	600	250 U
Tetrachloroethene (PCE)	4000	230	150	240	1300	46000	24000	6400
trans-1,2-Dichloroethene	100 U	2.6	3.2	7.4	30	1000 U	500 U	250 U
Trichloroethene (TCE)	12000	480	220	500	3600	120000	64000	25000
Vinyl Chloride	120	2.5 U	3.7	65	270	1200	550	250 U
Aromatic Compounds								
1,2,4-Trichlorobenzene	5800	7.7	48	96	2300	2400	1700	4800
1,2-Dichlorobenzene	210	2.5 U	5.6	15	140	1000 U	500 U	4100
1,3-Dichlorobenzene	350	3.2	24	110	570	1000 U	500 U	760
1,4-Dichlorobenzene	180	2.5	27	82	440	1000 U	520	4200
Benzene	200	2.5 U	2.0 U	20	84	1000 U	500 U	250 U
Chlorobenzene	200	2.5 U	7.0	58	240	1000 U	500 U	460
Pesticide Concentrations - SW846 8081 µg/L								
alpha-BHC	28	0.21	2.5	4.9	200	240	110	500
beta-BHC	3.1	0.29	0.71	1.2	21	32	18	59
delta-BHC	0.96 U	0.064	4.2	1.3	16	15	7.3	24 U
gamma-BHC (Lindane)	0.94 U	0.20	4.4	3.1	170	180	89	370
Total Metal Concentrations - SW846 7470 µg/L								
Mercury	3.81	21.5	0.20	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Total Flow 4th Quarter 2015 - gallons								
Flow	226,483	414,255	19,707	84,556	206,323	471,260	385,143	81,289
Total Mass Removed 3rd Quarter 2015 - pounds								
Aliphatic Compounds	**35.0**	**3.4**	**0.09**	**1.1**	**15.9**	**762.4**	**326.4**	**23.2**
Aromatic Compounds	**13.2**	**0.0**	**0.018**	**0.3**	**6.5**	**9.5**	**7.2**	**9.8**
Pesticides	**0.06**	**0.003**	**0.002**	**0.01**	**0.7**	**1.8**	**0.7**	**0.6**
Mercury	**0.01**	**0.075**	**0.0000**	**0.0001**	**0.000**	**0.0008**	**0.0006**	**0.0000**

Notes:

U - constituent not detected - reporting limit shown.
ug/L - micrograms per liter

Prepared by: T. Donnell 01/25/2016
Checked by: T. Englund 01/25/2016

Table 3.6: Constituent Mass Removal and Groundwater Extraction Summary (Dec 1997 to Present)

Quarter	Constituent Mass Removed								Total Groundwater Extracted	
	Aliphatic VOCs		Aromatic VOCs		Pesticides		Mercury			
	pounds		pounds		pounds		pounds		gallons	
Q1-98	NA		NA		NA		NA		210,000	
Q2-98	354.7		34.9578		0.15		0.16608		1,175,800	
Q3-98	580.4		16.397		4.87		0.31233		2,575,531	
Q4-98	1193.7		82.1497		5.17		0.15449		4,052,996	
1998 Total		2,129		133.50		10		0.63289		8,014,327
Q1-99	790.3		24.3354		8.47		3.51375		4,233,520	
Q2-99	1019.7		17.0826		7.10		0.15335		3,991,584	
Q3-99	1117.9		77.0616		8.74		0.10204		5,219,208	
Q4-99	1016.3		36.4233		6.83		0.02489		6,366,934	
1999 Total		3,944		154.90		31		3.79403		19,811,246
Q1-00	1247.1		72.3109		24.15		0.06115		6,757,603	
Q2-00	1411.3		106.858		10.27		0.05932		6,663,345	
Q3-00	907.8		103.288		18.67		0.05645		6,007,755	
Q4-00	1168.9		90.3489		9.61		0.01237		6,803,495	
2000 Total		4,735		372.81		63		0.18929		26,232,198
Q1-01	1316.5		90.8135		6.72		0.05640		7,379,548	
Q2-01	2596.9		113.195		11.86		0.03898		8,474,363	
Q3-01 [a]	2384.7	[a]	105.46	[a]	11.08	[a]	0.03094	[a]	7,607,539	
Q4-01	575.1		63.3279		8.37		0.05329		5,642,388	
2001 Total		6,873		372.80		38		0.17960		29,103,838
Q1-02	1266.9		53.4303		6.92		0.06152		6,580,672	
Q2-02	472.1		59.6619		6.69		0.07870		8,693,727	
Q3-02	1189.9		72.3968		6.04		0.06637		5,950,649	
Q4-02	443.8		38.5437		3.50		0.07369		5,385,584	
2002 Total		3,373		224.03		23		0.28027		26,610,632
Q1-03	879.8		44.8224		3.47		0.58368		5,151,629	
Q2-03	1726.1		162.614		5.24		0.06155		7,276,723	
Q3-03	1459.9		89.6481		0.00		0.12051		6,700,727	
Q4-03	1593.7		68.184		5.21		0.05788		6,483,046	
2003 Total		5,660		365.27		14		0.82363		25,612,125
Q1-04	1414.7		86.4896		4.85		0.03647		5,846,144	
Q2-04	1839.9		99.5038		5.77		0.05817		6,826,643	
Q3-04 [a]	1961.3	[a]	113.335	[a]	8.08	[a]	0.04811	[a]	6,494,680	
Q4-04	3609.9		83.9802		6.08		0.18456		8,127,002	
2004 Total		8,826		383.31		25		0.32732		27,294,469

Table 3.6: Constituent Mass Removal and Groundwater Extraction Summary (Dec 1997 to Present)

Quarter	Constituent Mass Removed								Total Groundwater Extracted	
	Aliphatic VOCs		Aromatic VOCs		Pesticides		Mercury			
	pounds		pounds		pounds		pounds		gallons	
Q1-05 [a]	2591.7	[a]	71.5544	[a]	4.64	[a]	0.13792	[a]	6,490,183	
Q2-05	1131.5		38.9625		3.46		0.03594		5,910,497	
Q3-05 [a]	828.9	[a]	33.114	[a]	2.81	[a]	0.04407	[a]	7,113,517	
Q4-05	833.0		50.4396		6.69		0.08576		5,271,114	
2005 Total		5,385		194.07		18		0.30369		24,785,311
Q1-06	991.4		52.2367		3.55		0.02144		5,139,061	
Q2-06	1118.8		36.7004		4.43		0.03623		8,872,651	
Q3-06	1118.9		52.538		4.22		0.01536		8,253,291	
Q4-06	1118.0		59.4582		4.88		0.04032		8,959,291	
2006 Total		4,347		200.93		17		0.11336		31,224,294
Q1-07	1347.8		61.4375		4.04		0.02170		7,250,389	
Q2-07	1658.2		36.9582		4.19		0.04413		8,203,421	
Q3-07	1307.5		82.328		5.31		0.03239		6,553,414	
Q4-07	1500.9		85.3163		7.78		0.02990		5,741,687	
2007 Total		5,815		266.04		21		0.12812		27,748,911
Q1-08	887.1		47.5786		3.33		0.05402		6,394,472	
Q2-08	1221.4		49.3187		4.23		0.00961		6,750,450	
Q3-08	1600.6		89.449		6.74		0.00833		8,159,637	
Q4-08	1928.0		110.694		7.59		0.01118		9,010,318	
2008 Total		5,637		297.04		22		0.08315		30,314,877
Q1-09	1600.7		69.9005		5.66		0.00585		7,487,247	
Q2-09	1615.2		74.4036		5.65		0.01025		6,960,098	
Q3-09	1762.8		127.808		8.18		0.00885		8,806,214	
Q4-09	1608.7		107.754		30.36		0.02216		9,730,305	
2009 Total		6,587		379.87		50		0.04711		32,983,864
Q1-10	2136.5		93.543		5.73		0.00146		8,157,833	
Q2-10	1969.3		79.81		4.28		0.00523		7,255,838	
Q3-10	1609.0		81.4295		3.76		0.04101		7,532,651	
Q4-10	1711.1		94.2708		4.85		0.02593		7,127,476	
2010 Total		7,426		349.05		19		0.07362		30,073,798
Q1-11	1560.2		53.8423		3.79		0.02017		6,732,218	
Q2-11	1729.4		111.407		4.10		0.01348		5,811,286	
Q3-11	1618.2		82.0094		5.30		0.02617		9,060,804	
Q4-11	1551.8		99.6175		5.18		0.00878		6,319,658	
2011 Total		6,460		346.88		18		0.06860		27,923,966

Table 3.6: Constituent Mass Removal and Groundwater Extraction Summary (Dec 1997 to Present)

Quarter	Constituent Mass Removed								Total Groundwater Extracted	
	Aliphatic VOCs		Aromatic VOCs		Pesticides		Mercury			
	pounds		pounds		pounds		pounds		gallons	
Q1-12	1483.9		57.354		4.10		0.00569		8,474,213	
Q2-12	1561.5		106.072		4.92		0.00880		7,582,966	
Q3-12	3464.2		146.031		7.47		0.00535		6,043,496	
Q4-12	1398.7		119.249		4.98		0.00183		5,169,991	
2012 Total		7,908		428.71		21		0.02167		27,270,666
Q1-13	1632.4		100.649		3.33		0.00106		3,486,167	
Q2-13	316.9		48.8031		1.92		0.00129		2,581,033	
Q3-13	754.8		47.8548		2.31		0.00065		2,271,761	
Q4-13	1064.1		64.5173		6.00		0.00219		3,471,228	
2013 Total		3,768		261.82		14		0.00519		11,810,189
Q1-14	1115.9		51.6107		4.33		0.00024		2,438,406	
Q2-14	1024.1		65.0017		4.41		0.13581		3,182,334	
Q3-14	1230.4		80.2663		4.13		0.10278		3,414,832	
Q4-14	1581.5		66.8357		7.86		0.06162		2,804,511	
2014 Total		4,952		263.71		21		0.30046		11,840,083
Q1-15	648.09		55.9612		2.96		0.06265		1,552,869	
Q2-15	546.10		51.3919		2.69		0.05781		1,890,659	
Q3-15	632.42		83.0847		3.03		0.02029		2,416,844	
Q4-15	1167.5		46.4160		3.97		0.08380		1,889,016	
2015 Total		2,994		236.85		13		0.22455		7,749,387
SYSTEM TOTALS		**96,818**		**5,232**		**437**		**7.6**		**426,404,182**

[a] Estimated loading based on replication of previous quarter's constituent concentrations.
Flow data are actual for each quarter

Prepared by: A. Nelson 02/29/2016
Checked by: S. Gallagher 03/02/2016

Table 3.7: March 24, 2015 GWTS Monitoring Data and Performance Calculation

Sample Location: Sample Date:	POTW Permit Daily Maximum Limit (lbs/day)	Sample AIR STRIPPER INFLUENT 3/24/2015	Calculation AIR STRIPPER INFLUENT LOADING (LB/DAY)	Sample AIR STRIPPER EFFLUENT 3/24/2015	Calculation AIR STRIPPER EFFLUENT LOADING (LB/DAY)	Calculation AIR STRIPPER REMOVAL EFFICIENCY (%) 3/24/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	NA	250 U	NA	1.0 U	NA	NA
1,1,2,2-Tetrachloroethane	7.0	2900	0.57	46	0.01	98.4%
1,1,2-Trichloroethane	NA	250 U	NA	1.0 U	NA	NA
1,1-Dichloroethene	NA	250 U	NA	1.0 U	NA	NA
Carbon tetrachloride	NA	250 U	NA	1.0 U	NA	NA
Chloromethane (Methyl chloride)	NA	250 U	NA	1.0 U	NA	NA
cis-1,2-Dichloroethene	NA	2100	NA	13	NA	99.4%
Methylene chloride (Dichloromethane)	NA	280	NA	2.0	NA	99.3%
Tetrachloroethene (PCE)	NA	10000	NA	23	NA	99.8%
trans-1,2-Dichloroethene	NA	250 U	NA	1.0 U	NA	NA
Trichloroethene (TCE)	0.25	25000	4.91	89	0.017	99.6%
Vinyl Chloride	NA	250 U	NA	1.0 U	NA	NA
Aromatic Compounds						
1,2,4-Trichlorobenzene	NA	790	NA	12	NA	98.5%
1,2-Dichlorobenzene	NA	250 U	NA	3.0	NA	NA
1,3-Dichlorobenzene	NA	250 U	NA	1.1	NA	NA
1,4-Dichlorobenzene	NA	280	NA	3.4	NA	98.8%
Benzene	NA	250 U	NA	1.0 U	NA	NA
Chlorobenzene	NA	250 U	NA	1.0 U	NA	NA
Pesticide Concentrations - SW846 8081 µg/L						
alpha-BHC	NA	78	0.02	60	0.01	23.1%
beta-BHC	NA	8.5	0.00	8.9	0.00	NA
delta-BHC	NA	5.9	0.00	5.9	0.00	0.0%
gamma-BHC (Lindane)	NA	58	0.01	46	0.01	20.7%
Total BHCs	0.07		0.03		0.02	
Total Metal Concentrations - SW846 7470 ug/L						
Mercury	0.183	0.5	0.00010	0.68	0.00013	NA
Daily Flow (gallons/day)						
Flow	NA	23,493	NA	23,493	NA	NA

Notes:
U - constituent not detected - reporting limit shown.
ug/L - micrograms per liter
mg/L - milligrams per liter
NA - not applicable

Table 3.7: March 24, 2015 GWTS Monitoring Data and Performance Calculation

Sample Location: Sample Date:	Sample BETWEEN CARBON VESSELS 3/24/2015	BETWEEN CARBON VESSELS LOADING (LB/DAY)	Calculation CARBON VESSEL 1 REMOVAL EFFICIENCY (%) 3/24/2015	Sample SYSTEM EFFLUENT 3/24/2015	SYSTEM EFFLUENT LOADING (LB/DAY)	Calculation CARBON VESSEL 2 REMOVAL EFFICIENCY (%) 3/24/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	1.0 U	NA	NA	1.0 U	NA	NA
1,1,2,2-Tetrachloroethane	12	0.00	73.9%	2.2	0.00	81.7%
1,1,2-Trichloroethane	1.0 U	NA	NA	1.0 U	NA	NA
1,1-Dichloroethene	1.0 U	NA	NA	1.0 U	NA	NA
Carbon tetrachloride	1.0 U	NA	NA	1.0 U	NA	NA
Chloromethane (Methyl chloride)	1.0 U	NA	NA	1.0 U	NA	NA
cis-1,2-Dichloroethene	4.8	NA	63.1%	1.1	NA	77.1%
Methylene chloride (Dichloromethane)	1.2	NA	40.0%	1.3	NA	NA
Tetrachloroethene (PCE)	3.4	NA	85.2%	1.0 U	NA	70.6%
trans-1,2-Dichloroethene	1.0 U	NA	NA	1.0 U	NA	NA
Trichloroethene (TCE)	15	0.00	83.1%	1.4	0.00027	90.7%
Vinyl Chloride	1.0 U	NA	NA	1.0 U	NA	NA
Aromatic Compounds						
1,2,4-Trichlorobenzene	2.3	NA	80.8%	1.0 U	NA	56.5%
1,2-Dichlorobenzene	1.0 U	NA	66.7%	1.0 U	NA	NA
1,3-Dichlorobenzene	1.0 U	NA	9.1%	1.0 U	NA	NA
1,4-Dichlorobenzene	1.0 U	NA	70.6%	1.0 U	NA	NA
Benzene	1.0 U	NA	NA	1.0 U	NA	NA
Chlorobenzene	1.0 U	NA	NA	1.0 U	NA	NA
Pesticide Concentrations - SW846 8081 µg/L						
alpha-BHC	0.29	0.00	99.5%	0.076	0.000	NA
beta-BHC	0.76	0.00	NA	0.13	0.000	82.9%
delta-BHC	0.47	0.00	92.0%	0.047 U	0.000	90.0%
gamma-BHC (Lindane)	0.18	0.00	99.6%	0.047 U	0.000	73.9%
Total BHCs		0.00			0.000	
Total Metal Concentrations - SW846 7470 ug/L						
Mercury	0.31	0.00006	54.4%	0.25	0.00005	19.4%
Daily Flow (gallons/day)						
Flow	23,493	NA	NA	23,493	NA	NA

Notes:
U - constituent not detected - reporting limit shown.
ug/L - micrograms per liter
mg/L - milligrams per liter
NA - not applicable

Prepared by: R. Yardley 06/10/2015
Checked by: A. Nelson 07/30/2015

Table 3.8: June 16, 2015 GWTS Monitoring Data and Performance Calculation

Sample Location: Sample Date:	POTW Permit Daily Maximum Limit (lbs/day)	Sample AIR STRIPPER INFLUENT 6/16/2015	Calculation AIR STRIPPER INFLUENT LOADING (LB/DAY) 6/16/2015	Sample AIR STRIPPER EFFLUENT 6/16/2015	Calculation AIR STRIPPER EFFLUENT LOADING (LB/DAY) 6/16/2015	Calculation AIR STRIPPER REMOVAL EFFICIENCY (%) 6/16/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	NA	100 U	NA	1.0 U	NA	NA
1,1,2,2-Tetrachloroethane	7.0	3400	0.67	42	0.01	98.8%
1,1,2-Trichloroethane	NA	100 U	NA	1.0 U	NA	NA
1,1-Dichloroethene	NA	100 U	NA	1.0 U	NA	NA
Carbon tetrachloride	NA	100	NA	1.0 U	NA	99.0%
Chloromethane (Methyl chloride)	NA	100 U	NA	1.0 U	NA	NA
cis-1,2-Dichloroethene	NA	2400	NA	12	NA	99.5%
Methylene chloride (Dichloromethane)	NA	180	NA	1.2	NA	99.3%
Tetrachloroethene (PCE)	NA	9500	NA	14	NA	99.9%
trans-1,2-Dichloroethene	NA	100 U	NA	1.0 U	NA	NA
Trichloroethene (TCE)	0.25	27000 D	5.33	64	0.013	99.8%
Vinyl Chloride	NA	220	NA	1.0 U	NA	99.5%
Aromatic Compounds						
1,2,4-Trichlorobenzene	NA	1200	NA	1.7	NA	99.9%
1,2-Dichlorobenzene	NA	100 U	NA	1.0 U	NA	NA
1,3-Dichlorobenzene	NA	140	NA	1.0 U	NA	99.3%
1,4-Dichlorobenzene	NA	200	NA	1.0 U	NA	99.5%
Benzene	NA	100 U	NA	1.0 U	NA	NA
Chlorobenzene	NA	110	NA	1.0 U	NA	99.1%
Pesticide Concentrations - SW846 8081 µg/L						
alpha-BHC	NA	70	0.01	0.47 U	0.0001	99.3%
beta-BHC	NA	8.1	0.00	6.6	0.001	NA
delta-BHC	NA	5.7	0.00	5.4	0.001	5.3%
gamma-BHC (Lindane)	NA	54	0.01	1.4	0.000	97.4%
Total BHCs	0.07	137.8	0.03	13.87	0.003	
Total Metal Concentrations - SW846 7470 ug/L						
Mercury	0.183	1.01	0.00020	1.19	0.00024	NA
Daily Flow (gallons/day)						
Flow	NA	23,627	NA	23,627	NA	NA

Notes:
U - constituent not detected - reporting limit shown.
D - concentration is the result of a dilution due to exceeding the calibration range.
ug/L - micrograms per liter
NA - not applicable

Table 3.8: June 16, 2015 GWTS Monitoring Data and Performance Calculation

Sample Location: / Sample Date:	Sample BETWEEN CARBON VESSELS 6/16/2015	Calculation BETWEEN CARBON VESSELS LOADING (LB/DAY) 6/16/2015	Calculation CARBON VESSEL 1 REMOVAL EFFICIENCY (%) 6/16/2015	Sample SYSTEM EFFLUENT 6/16/2015	Calculation SYSTEM EFFLUENT LOADING (LB/DAY) 6/16/2015	Calculation CARBON VESSEL 2 REMOVAL EFFICIENCY (%) 6/16/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	1.0 U	NA	NA	1.0 U	NA	NA
1,1,2,2-Tetrachloroethane	27	0.01	35.7%	16	0.003	40.7%
1,1,2-Trichloroethane	1.0 U	NA	NA	1.0 U	NA	NA
1,1-Dichloroethene	1.0 U	NA	NA	1.0 U	NA	NA
Carbon tetrachloride	1.0 U	NA	NA	1.0 U	NA	NA
Chloromethane (Methyl chloride)	1.0 U	NA	NA	1.0 U	NA	NA
cis-1,2-Dichloroethene	12	NA	NA	11	NA	8.3%
Methylene chloride (Dichloromethane)	1.0 U	NA	16.7%	1.0 U	NA	NA
Tetrachloroethene (PCE)	6.7	NA	52.1%	2.3	NA	65.7%
trans-1,2-Dichloroethene	1.0 U	NA	NA	1.0 U	NA	NA
Trichloroethene (TCE)	46	0.01	28.1%	20	0.004	56.5%
Vinyl Chloride	1.0 U	NA	NA	1.0 U	NA	NA
Aromatic Compounds						
1,2,4-Trichlorobenzene	1.0 U	NA	41.2%	1.0 U	NA	NA
1,2-Dichlorobenzene	1.0 U	NA	NA	1.0 U	NA	NA
1,3-Dichlorobenzene	1.0 U	NA	NA	1.0 U	NA	NA
1,4-Dichlorobenzene	1.0 U	NA	NA	1.0 U	NA	NA
Benzene	1.0 U	NA	NA	1.0 U	NA	NA
Chlorobenzene	1.0 U	NA	NA	1.0 U	NA	NA
Pesticide Concentrations - SW846 8081 µg/L						
alpha-BHC	9.3	0.002	NA	4.0	0.001	57.0%
beta-BHC	2.8	0.001	NA	0.84	0.0002	70.0%
delta-BHC	1.6	0.0003	70.4%	0.44	0.0001	72.5%
gamma-BHC (Lindane)	7.4	0.001	NA	2.7	0.001	63.5%
Total BHCs	21.1	0.004		7.98	0.002	
Total Metal Concentrations - SW846 7470 ug/L						
Mercury	0.82	0.00016	31.1%	0.59	0.00012	28.0%
Daily Flow (gallons/day)						
Flow	23,627	NA	NA	23,627	NA	NA

Notes:
U - constituent not detected - reporting limit shown.
D - concentration is the result of a dilution due to exceeding the calibration range.
ug/L - micrograms per liter
NA - not applicable

Prepared by: S. Gallagher 09/10/2015
Checked by: T. Englund 09/10/2015

Table 3.9: October 6, 2015 GWTS Monitoring Data and Performance Calculation

Sample Location: Sample Date:	POTW Permit Daily Maximum Limit (lbs/day)	Sample AIR STRIPPER INFLUENT 10/6/2015	Calculation AIR STRIPPER INFLUENT LOADING (LB/DAY) 10/6/2015	Sample AIR STRIPPER EFFLUENT 10/6/2015	Calculation AIR STRIPPER EFFLUENT LOADING (LB/DAY) 10/6/2015	Calculation AIR STRIPPER REMOVAL EFFICIENCY (%) 10/6/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	NA	100 U	NA	50 U	NA	NA
1,1,2,2-Tetrachloroethane	7.0	2100	0.53	1800	0.46	14.3%
1,1,2-Trichloroethane	NA	100 U	NA	50 U	NA	NA
1,1-Dichloroethene	NA	100 U	NA	50 U	NA	NA
Carbon tetrachloride	NA	100 U	NA	50 U	NA	50.0%
Chloromethane (Methyl chloride)	NA	100 U	NA	50 U	NA	NA
cis-1,2-Dichloroethene	NA	1400	NA	780	NA	44.3%
Methylene chloride (Dichloromethane)	NA	150	NA	73	NA	51.3%
Tetrachloroethene (PCE)	NA	4600	NA	1800	NA	60.9%
trans-1,2-Dichloroethene	NA	100 U	NA	50 U	NA	NA
Trichloroethene (TCE)	0.25	12000	3.05	5200	1.32	56.7%
Vinyl Chloride	NA	140	NA	50 U	NA	64.3%
Aromatic Compounds						
1,2,4-Trichlorobenzene	NA	500	NA	520	NA	NA
1,2-Dichlorobenzene	NA	100 U	NA	51	NA	NA
1,3-Dichlorobenzene	NA	130	NA	69	NA	46.9%
1,4-Dichlorobenzene	NA	220	NA	110	NA	50.0%
Benzene	NA	100 U	NA	50 U	NA	NA
Chlorobenzene	NA	100 U	NA	50 U	NA	NA
Pesticide Concentrations - SW846 8081 µg/L						
alpha-BHC	NA	79	0.02	2.9	0.0007	96.3%
beta-BHC	NA	7.8	0.00	7.4	0.002	5.1%
delta-BHC	NA	5.7	0.00	6.3	0.002	NA
gamma-BHC (Lindane)	NA	58	0.01	1.6	0.000	97.2%
Total BHCs	0.07	150.5	0.04	18.2	0.005	
Total Metal Concentrations - SW846 7470 ug/L						
Mercury	0.183	2.11	0.00054	2.24	0.00057	NA
Daily Flow (gallons/day)						
Flow	NA	30,358	NA	30,358	NA	NA

Notes:
U - constituent not detected - reporting limit shown.
ug/L - micrograms per liter
NA - not applicable

Table 3.9: October 6, 2015 GWTS Monitoring Data and Performance Calculation

Sample Location: / Sample Date:	Sample BETWEEN CARBON VESSELS 10/6/2015	Calculation BETWEEN CARBON VESSELS LOADING (LB/DAY) 10/6/2015	Calculation CARBON VESSEL 1 REMOVAL EFFICIENCY (%) 10/6/2015	Sample SYSTEM EFFLUENT 10/6/2015	Calculation SYSTEM EFFLUENT LOADING (LB/DAY) 10/6/2015	Calculation CARBON VESSEL 2 REMOVAL EFFICIENCY (%) 10/6/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	25 U	NA	NA	5.0 U	NA	NA
1,1,2,2-Tetrachloroethane	1500	0.38	16.7%	510	0.129	66.0%
1,1,2-Trichloroethane	25 U	NA	NA	7.4	NA	NA
1,1-Dichloroethene	25 U	NA	NA	5.0 U	NA	NA
Carbon tetrachloride	25 U	NA	NA	5.0 U	NA	NA
Chloromethane (Methyl chloride)	25 U	NA	NA	5.0 U	NA	NA
cis-1,2-Dichloroethene	460	NA	41.0%	130	NA	71.7%
Methylene chloride (Dichloromethane)	34	NA	53.4%	13	NA	61.8%
Tetrachloroethene (PCE)	1100	NA	38.9%	260	NA	76.4%
trans-1,2-Dichloroethene	25 U	NA	NA	5.0 U	NA	NA
Trichloroethene (TCE)	3300	0.84	36.5%	820	0.208	75.2%
Vinyl Chloride	27	NA	NA	6.2	NA	77.0%
Aromatic Compounds						
1,2,4-Trichlorobenzene	210	NA	59.6%	17	NA	91.9%
1,2-Dichlorobenzene	25 U	NA	NA	5.0 U	NA	NA
1,3-Dichlorobenzene	62	NA	10.1%	5.6	NA	91.0%
1,4-Dichlorobenzene	85	NA	22.7%	8.5	NA	90.0%
Benzene	25 U	NA	NA	6.4	NA	74.4%
Chlorobenzene	32	NA	NA	5.0 U	NA	NA
Pesticide Concentrations - SW846 8081 µg/L						
alpha-BHC	29	0.007	NA	31	0.008	NA
beta-BHC	6.7	0.002	9.5%	5.1	0.0013	23.9%
delta-BHC	4.4	0.0011	30.2%	2.7	0.0007	38.6%
gamma-BHC (Lindane)	21	0.005	NA	22	0.006	NA
Total BHCs	61.1	0.016		60.8	0.015	
Total Metal Concentrations - SW846 7470 ug/L						
Mercury	0.92	0.00023	58.9%	0.53	0.00013	42.4%
Daily Flow (gallons/day)						
Flow	30,358	NA	NA	30,358	NA	NA

Notes:
U - constituent not detected - reporting limit shown.
ug/L - micrograms per liter
NA - not applicable

Prepared by: T. Donnell 12/02/2015
Checked by: T. Englund 12/02/2015

Table 3.10: December 15, 2015 GWTS Monitoring Data and Performance Calculation

Sample Location: Sample Date:	POTW Permit Daily Maximum Limit (lbs/day)	Sample AIR STRIPPER INFLUENT 12/15/2015	Calculation AIR STRIPPER INFLUENT LOADING (LB/DAY) 12/15/2015	Sample AIR STRIPPER EFFLUENT 12/15/2015	Calculation AIR STRIPPER EFFLUENT LOADING (LB/DAY) 12/15/2015	Calculation AIR STRIPPER REMOVAL EFFICIENCY (%) 12/15/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	NA	250 U	NA	1.0 U	NA	NA
1,1,2,2-Tetrachloroethane	7.0	4300	0.80	150	0.03	96.5%
1,1,2-Trichloroethane	NA	250 U	NA	1.8	NA	NA
1,1-Dichloroethene	NA	250 U	NA	1.0 U	NA	NA
Carbon tetrachloride	NA	250 U	NA	1.0 U	NA	NA
Chloromethane (Methyl chloride)	NA	250 U	NA	1.0 U	NA	NA
cis-1,2-Dichloroethene	NA	3300	NA	37	NA	98.9%
Methylene chloride (Dichloromethane)	NA	340	NA	5.8	NA	98.3%
Tetrachloroethene (PCE)	NA	12000	NA	37	NA	99.7%
trans-1,2-Dichloroethene	NA	250 U	NA	1.0 U	NA	NA
Trichloroethene (TCE)	0.25	33000	6.10	180	0.03	99.5%
Vinyl Chloride	NA	360	NA	1.0 U	NA	99.7%
Aromatic Compounds						
1,2,4-Trichlorobenzene	NA	1300	NA	17	NA	98.7%
1,2-Dichlorobenzene	NA	250	NA	3.6	NA	98.6%
1,3-Dichlorobenzene	NA	250 U	NA	2.9	NA	98.8%
1,4-Dichlorobenzene	NA	450	NA	6.2	NA	98.6%
Benzene	NA	250 U	NA	1.6	NA	NA
Chlorobenzene	NA	250 U	NA	2.5	NA	NA
Pesticide Concentrations - SW846 8081 µg/L						
alpha-BHC	NA	140	0.03	79	0.0146	43.6%
beta-BHC	NA	18	0.003	18	0.003	0.0%
delta-BHC	NA	8.8	0.002	9.2	0.002	NA
gamma-BHC (Lindane)	NA	110	0.02	67	0.012	39.1%
Total BHCs	0.07		0.05		0.032	
Total Metal Concentrations - SW846 7470 ug/L						
Mercury	0.183	0.65	0.00012	0.51	0.00009	21.5%
Daily Flow (gallons/day)						
Flow	NA	22,122	NA	22,122	NA	NA

Notes:
U - constituent not detected - reporting limit shown.
ug/L - micrograms per liter
NA - not applicable

Table 3.10: December 15, 2015 GWTS Monitoring Data and Performance Calculation

Sample Location: / Sample Date:	Sample BETWEEN CARBON VESSELS 12/15/2015	Calculation BETWEEN CARBON VESSELS LOADING (LB/DAY) 12/15/2015	Calculation CARBON VESSEL 1 REMOVAL EFFICIENCY (%) 12/15/2015	Sample SYSTEM EFFLUENT 12/15/2015	Calculation SYSTEM EFFLUENT LOADING (LB/DAY) 12/15/2015	Calculation CARBON VESSEL 2 REMOVAL EFFICIENCY (%) 12/15/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	1.0 U	NA	NA	1.0 U	NA	NA
1,1,2,2-Tetrachloroethane	11	0.002	92.7%	1.0 U	0.0002	90.9%
1,1,2-Trichloroethane	1.0 U	NA	44.4%	1.0 U	NA	NA
1,1-Dichloroethene	1.0 U	NA	NA	1.0 U	NA	NA
Carbon tetrachloride	1.0 U	NA	NA	1.0 U	NA	NA
Chloromethane (Methyl chloride)	1.0 U	NA	NA	1.0 U	NA	NA
cis-1,2-Dichloroethene	1.4	NA	96.2%	1.0 U	NA	28.6%
Methylene chloride (Dichloromethane)	1.0 U	NA	82.8%	1.0 U	NA	NA
Tetrachloroethene (PCE)	1.7	NA	95.4%	1.0 U	NA	41.2%
trans-1,2-Dichloroethene	1.0 U	NA	NA	1.0 U	NA	NA
Trichloroethene (TCE)	6.6	0.001	96.3%	1.0 U	0.0002	84.8%
Vinyl Chloride	1.0 U	NA	NA	1.0 U	NA	NA
Aromatic Compounds						
1,2,4-Trichlorobenzene	1.0 U	NA	94.1%	1.0 U	NA	NA
1,2-Dichlorobenzene	1.0 U	NA	72.2%	1.0 U	NA	NA
1,3-Dichlorobenzene	1.0 U	NA	65.5%	1.0 U	NA	NA
1,4-Dichlorobenzene	1.0 U	NA	83.9%	1.0 U	NA	NA
Benzene	1.0 U	NA	37.5%	1.0 U	NA	NA
Chlorobenzene	1.0 U	NA	60.0%	1.0 U	NA	NA
Pesticide Concentrations - SW846 8081 µg/L						
alpha-BHC	1.1	0.0002	98.6%	0.39	0.0001	64.5%
beta-BHC	0.39	0.0001	97.8%	0.070	0.00001	82.1%
delta-BHC	0.24 U	0.00004	97.4%	0.048 U	0.00001	NA
gamma-BHC (Lindane)	0.77	0.0001	98.9%	0.23	0.00004	70.1%
Total BHCs		0.0005			0.0001	
Total Metal Concentrations - SW846 7470 ug/L						
Mercury	0.20 U	0.00004	60.8%	0.20 U	0.00004	0.0%
Daily Flow (gallons/day)						
Flow	22,122	NA	NA	22,122	NA	NA

Notes:
U - constituent not detected - reporting limit shown.
ug/L - micrograms per liter
NA - not applicable

Prepared by: T. Donnell 01/25/2016
Checked by: T. Englund 01/25/2016

Table 4.1: April 8, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	4/8/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A-ZONE - OLIN				
OBA-1A	562.33	570.67	3.91	566.76
OBA-2A	561.32	572.54	DRY	561.32
OBA-3A	552.36	572.07	15.19	556.88
OBA-4A	558.34	572.42	11.02	561.40
OBA-5A	557.72	571.72	7.35	564.37
OBA-6A	561.01	570.17	5.04	565.13
OBA-7A	562.71	573.39	7.05	566.34
OBA-8A	559.59	572.49	10.45	562.04
OBA-9A	558.01	569.24	7.01	562.23
OBA-9AR	557.28	570.22	12.98	557.24
OBA-10A	552.15	568.39	5.93	562.46
OBA-11A	558.76	572.83	13.12	559.71
OBA-14A	552.44	570.67	13.41	557.26
OBA-15A	551.06	572.59	15.16	557.43
OBA-16A	560.42	573.26	10.20	563.06
OBA-18A	559.18	573.47	13.15	560.32
OBA-19A	558.08	573.86	10.70	563.16
OBA-23A	560.94	570.19	7.69	562.50
OBA-24A	557.76	568.95	6.09	562.86
OBA-25A	558.07	569.02	5.01	564.01
OBA-26A	557.28	569.55	6.29	563.26
PN-1A	560.21	570.51	6.40	564.11
PN-2A	561.41	570.64	7.26	563.38
PN-3A	560.12	571.80	NM	NM
PN-4A	558.94	568.35	6.70	561.65
PN-5A	558.95	568.55	6.55	562.00
PN-6A	559.06	568.43	6.79	561.64
PN-7A	558.52	568.23	NM	NM
PN-8A	557.53	568.28	4.35	563.93
PN-9A	558.97	570.74	10.24	560.50
PN-10A	561.35	570.11	6.36	563.75
PN-11A	557.78	567.49	4.95	562.54
PN-12A	558.85	570.07	4.81	565.26
PN-13A	559.98	573.25	8.45	564.80
PN-14A	560.62	573.30	8.31	564.99
PN-15A	559.44	570.69	6.75	563.94
PN-16A	560.17	570.44	6.45	563.99
PN-17A	560.32	570.55	5.06	565.49
PN-18A	561.55	570.23	6.00	564.23
PN-19A	562.00	570.74	7.33	563.41
PN-20A	558.35	570.07	9.28	560.79
PN-21A	558.77	569.48	4.65	564.83
Gill Creek Stilling Well[1]	NA	571.48	NA	562.08

Table 4.1: April 8, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	4/8/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A-ZONE - SOLVENT[6]				
OW-5A	NA	573.05	11.90	561.15
OW-6A	NA	572.10	9.66	562.44
OW-20A	NA	572.62	11.95	560.67
OW-21A	NA	569.33	DRY	DRY
OW-22A	NA	570.68	5.72	564.96
A/B-ZONE[4,5]				
PR-1	561.70	572.29	7.81	564.48
PR-1-PZ	561.70	571.15	6.55	564.60
PR-2	561.17	572.21	13.75	558.46
PR-2-PZ	561.17	572.17	15.05	557.12
PR-3	557.65	572.39	15.45	556.94
PR-3-PZ	557.65	571.69	14.26	557.43
PR-4	556.58	569.66	14.05	555.61
PR-4-PZ	556.58	569.65	13.50	556.15
PR-5	558.47	570.18	13.08	557.10
PR-5-PZ	558.47	569.23	11.68	557.55
PR-6	559.35	568.28	8.34	559.94
PR-7	558.56	568.57	7.66	560.91
PR-8	558.91	567.97	8.70	559.27
PR-9	556.16	568.39	8.69	559.70
PR-10	558.38	568.16	NM	NM
PR-11	558.31	567.53	3.42	564.11
PR-12	558.37	569.28	12.27	557.01
PR-13	559.15	568.69	10.83	557.86
PR-14	558.59	568.60	7.23	561.37
RW-1	560.93	573.22	15.11	558.11
RW-1-PZ	560.93	572.33	14.19	558.14
RW-2	559.03	572.01	15.03	556.98
RW-2-PZ	559.03	571.76	14.84	556.92
RW-3	556.69	569.40	12.44	556.96
RW-3-PZ	556.69	569.37	12.39	556.98
RW-4	557.05	569.27	12.38	556.89
RW-4-PZ	557.05	569.33	12.47	556.86
RW-5	556.81	569.28	12.17	557.11
RW-5-PZ	556.81	569.24	12.20	557.04
B-ZONE[5]				
OBA-1B	NA	570.35	14.96	555.39
OBA-2B	NA	572.63	15.45	557.18
OBA-4B	NA	573.03	14.41	558.62
OBA-5B	NA	572.29	12.11	560.18
OBA-6B	NA	570.31	5.05	565.26
OBA-7B	NA	573.97	9.55	564.42
OBA-8B	NA	572.64	14.01	558.63

Table 4.1: April 8, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	4/8/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
B-ZONE CONTINUED[5]				
OBA-11B	NA	572.87	15.65	557.22
OBA-14B	NA	570.76	13.69	557.07
OBA-16B	NA	572.99	15.31	557.68
OBA-23B	NA	570.04	11.74	558.30
OBA-24B	NA	568.76	11.21	557.55
OBA-25B	NA	568.93	11.15	557.78
OBA-26B	NA	569.65	11.80	557.85
PN-1B	NA	570.32	11.91	558.41
PN-2B	NA	570.44	13.25	557.19
PN-3B	NA	571.73	NM	NM
PN-4B	NA	568.46	11.24	557.22
PN-5B	NA	568.58	11.44	557.14
PN-6B	NA	568.56	11.42	557.14
PN-7B	NA	568.45	NM	NM
PN-8B	NA	567.85	10.81	557.04
PN-9B	NA	570.68	13.43	557.25
PN-10B	NA	571.15	12.99	558.16
PN-11B	NA	567.78	10.18	557.60
PN-12B	NA	570.00	12.15	557.85
PN-13B	NA	573.24	15.41	557.83
PN-14B	NA	573.30	9.20	564.10
PN-15B	NA	570.70	13.05	557.65
PN-16B	NA	570.36	9.35	561.01
PN-17B	NA	570.54	12.05	558.49
PN-18B	NA	570.50	11.73	558.77
PN-19B	NA	570.64	10.91	559.73
PN-20B	NA	569.70	12.64	557.06
PN-21B	NA	569.39	10.18	559.21
PN-22B	NA	569.08	NM	NM
PN-23B	NA	568.90	NM	NM
PN-24B	NA	570.87	13.50	557.37
B-ZONE - SOLVENT[6]				
PW-3B	NA	571.21	18.20	553.01
PW-4B	NA	569.72	13.29	556.43
OW-4B	NA	570.55	13.05	557.50
OW-14B	NA	570.87	13.82	557.05
OW-15B	NA	569.78	12.27	557.51
OW-22B	NA	570.90	13.72	557.18
OW-23B	NA	569.67	12.66	557.01
OW-24B	NA	570.36	13.05	557.31
OW-25B	NA	570.90	13.79	557.11
OW-31B	NA	570.14	12.89	557.25
OW-32B	NA	569.99	12.55	557.44
OW-33B	NA	569.55	12.32	557.23

Table 4.1: April 8, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	4/8/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
C-ZONE				
OBA-1C	NA	570.41	9.13	561.28
OBA-4C	NA	573.05	16.03	557.02
OBA-7C	NA	574.30	20.05	554.25
OBA-14C	NA	570.15	15.40	554.75
OBA-15B	NA	573.13	16.05	557.08
CD-ZONE				
OBA-2C	NA	572.43	17.61	554.82
OBA-3C	NA	572.67	18.51	554.16
OBA-5C	NA	572.01	18.09	553.92
OBA-6C	NA	570.35	15.34	555.01
OBA-8C	NA	573.14	22.04	551.10
OBA-11C	NA	572.94	15.55	557.39
Olin Production Well[2]	NA	NA	502	554.9

Notes:

1. The Gill Creek Stilling Well is monitored with a dedicated level transducer which collects hourly elevation measurements. The water elevation shown and used to prepare the A-Zone potentiometric surface map is the average hourly elevation for the date shown.

2. The Olin Production Well water elevation is calculated based on the production well flow rate using an empirical formula presented in the 1994 Remedial Facility Investigation. The flow rate is shown in place of the depth to water.

3. The orange highlighted water elevations are at or below the bottom of the A-Zone. A-Zone bottom elevations were used for these wells on the A-Zone potentiometric surface map.

4. Water elevations from the A/B-Zone wells with red text were used for the A-Zone potentiometric surface map. Pumping well piezometers (green text) were used for both A-Zone and B-Zone potentiometric surface maps.

5. The blue highlighted wells were not used when preparing the B-Zone potentiometric surface map. These appear to be poorly or not connected to the B-Zone based on their typical water elevations which are more than 2 feet higher than the average B-Zone elevation.

6. Water levels from A-Zone & B-Zone Solvent wells located on Olin property between Gill Creek and Dupont Road were measured and used for the A-Zone and B-Zone potentiometric surface maps.

Prepared by: A. Nelson 02/26/2016
Checked by: T. Englund 03/04/2016

Table 4.2: July 7, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	7/7/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A-ZONE - OLIN				
OBA-1A	562.33	570.67	4.12	566.55
OBA-2A	561.32	572.54	DRY	561.32
OBA-3A	552.36	572.07	14.78	557.29
OBA-4A	558.34	572.42	12.11	560.31
OBA-5A	557.72	571.72	7.25	564.47
OBA-6A	561.01	570.17	4.29	565.88
OBA-7A	562.71	573.39	9.11	564.28
OBA-8A	559.59	572.49	14.52	557.97
OBA-9A	558.01	569.24	6.48	562.76
OBA-9AR	557.28	570.22	12.29	557.93
OBA-10A	552.15	568.39	5.98	562.41
OBA-11A	558.76	572.83	13.01	559.82
OBA-14A	552.44	570.67	13.35	557.32
OBA-15A	551.06	572.59	15.11	557.48
OBA-16A	560.42	573.26	10.06	563.20
OBA-18A	559.18	573.47	13.19	560.28
OBA-19A	558.08	573.86	11.94	561.92
OBA-23A	560.94	570.19	8.41	561.78
OBA-24A	557.76	568.95	6.41	562.54
OBA-25A	558.07	569.02	5.25	563.77
OBA-26A	557.28	569.55	6.21	563.34
PN-1A	560.21	570.51	DRY	DRY
PN-2A	561.41	570.64	5.98	564.66
PN-3A	560.12	571.80	5.71	566.09
PN-4A	558.94	568.35	6.20	562.15
PN-5A	558.95	568.55	6.40	562.15
PN-6A	559.06	568.43	6.80	561.63
PN-7A	558.52	568.23	5.97	562.26
PN-8A	557.53	568.28	4.53	563.75
PN-9A	558.97	570.74	9.28	561.46
PN-10A	561.35	570.11	DRY	DRY
PN-11A	557.78	567.49	4.15	563.34
PN-12A	558.85	570.07	5.11	564.96
PN-13A	559.98	573.25	7.91	565.34
PN-14A	560.62	573.30	7.96	565.34
PN-15A	559.44	570.69	7.18	563.51
PN-16A	560.17	570.44	5.78	564.66
PN-17A	560.32	570.55	6.01	564.54
PN-18A	561.55	570.23	6.07	564.16
PN-19A	562.00	570.74	7.35	563.39
PN-20A	558.35	570.07	8.11	561.96
PN-21A	558.77	569.48	4.89	564.59
Gill Creek Stilling Well[1]	NA	571.48	NA	562.08

Table 4.2: July 7, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	7/7/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A-ZONE - SOLVENT[6]				
OW-5A	NA	573.05	12.18	560.87
OW-6A	NA	572.10	9.81	562.29
OW-20A	NA	572.62	12.12	560.50
OW-21A	NA	569.33	10.65	558.68
OW-22A	NA	570.68	9.28	561.40
A/B-ZONE[4,5]				
PR-1	561.70	572.29	7.30	564.99
PR-1-PZ	561.70	571.15	5.96	565.19
PR-2	561.17	572.21	14.70	557.51
PR-2-PZ	561.17	572.17	15.02	557.15
PR-3	557.65	572.39	15.39	557.00
PR-3-PZ	557.65	571.69	14.73	556.96
PR-4	556.58	569.66	14.18	555.48
PR-4-PZ	556.58	569.65	13.61	556.04
PR-5	558.47	570.18	12.38	557.80
PR-5-PZ	558.47	569.23	12.02	557.21
PR-6	559.35	568.28	10.51	557.77
PR-7	558.56	568.57	8.70	559.87
PR-8	558.91	567.97	8.80	559.17
PR-9	556.16	568.39	8.01	560.38
PR-10	558.38	568.16	7.61	560.55
PR-11	558.31	567.53	4.11	563.42
PR-12	558.37	569.28	11.62	557.66
PR-13	559.15	568.69	11.17	557.52
PR-14	558.59	568.60	9.01	559.59
RW-1	560.93	573.22	15.69	557.53
RW-1-PZ	560.93	572.33	14.73	557.60
RW-2	559.03	572.01	14.79	557.22
RW-2-PZ	559.03	571.76	14.60	557.16
RW-3	556.69	569.40	12.38	557.02
RW-3-PZ	556.69	569.37	12.32	557.05
RW-4	557.05	569.27	12.53	556.74
RW-4-PZ	557.05	569.33	12.58	556.75
RW-5	556.81	569.28	12.11	557.17
RW-5-PZ	556.81	569.24	12.16	557.08
B-ZONE[5]				
OBA-1B	NA	570.35	11.41	558.94
OBA-2B	NA	572.63	15.51	557.12
OBA-4B	NA	573.03	15.09	557.94
OBA-5B	NA	572.29	12.41	559.88
OBA-6B	NA	570.31	5.89	564.42
OBA-7B	NA	573.97	9.76	564.21
OBA-8B	NA	572.64	15.81	556.83

Table 4.2: July 7, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	7/7/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
B-ZONE CONTINUED[5]				
OBA-11B	NA	572.87	16.07	556.80
OBA-14B	NA	570.76	13.64	557.12
OBA-16B	NA	572.99	14.38	558.61
OBA-23B	NA	570.04	12.32	557.72
OBA-24B	NA	568.76	11.19	557.57
OBA-25B	NA	568.93	11.48	557.45
OBA-26B	NA	569.65	11.97	557.68
PN-1B	NA	570.32	12.11	558.21
PN-2B	NA	570.44	11.61	558.83
PN-3B	NA	571.73	12.06	559.67
PN-4B	NA	568.46	10.98	557.48
PN-5B	NA	568.58	11.50	557.08
PN-6B	NA	568.56	10.98	557.58
PN-7B	NA	568.45	11.14	557.31
PN-8B	NA	567.85	10.99	556.86
PN-9B	NA	570.68	13.99	556.69
PN-10B	NA	571.15	13.50	557.65
PN-11B	NA	567.78	9.79	557.99
PN-12B	NA	570.00	12.55	557.45
PN-13B	NA	573.24	15.12	558.12
PN-14B	NA	573.30	8.45	564.85
PN-15B	NA	570.70	12.91	557.79
PN-16B	NA	570.36	8.97	561.39
PN-17B	NA	570.54	11.78	558.76
PN-18B	NA	570.50	10.03	560.47
PN-19B	NA	570.64	11.06	559.58
PN-20B	NA	569.70	20.16	549.54
PN-21B	NA	569.39	9.86	559.53
PN-22B	NA	569.08	NM	NM
PN-23B	NA	568.90	NM	NM
PN-24B	NA	570.87	13.15	557.72
B-ZONE - SOLVENT[6]				
PW-3B	NA	571.21	16.12	555.09
PW-4B	NA	569.72	13.24	556.48
OW-4B	NA	570.55	13.90	556.65
OW-14B	NA	570.87	14.10	556.77
OW-15B	NA	569.78	12.44	557.34
OW-22B	NA	570.90	13.80	557.10
OW-23B	NA	569.67	12.65	557.02
OW-24B	NA	570.36	13.23	557.13
OW-25B	NA	570.90	14.23	556.67
OW-31B	NA	570.14	13.00	557.14
OW-32B	NA	569.99	11.95	558.04
OW-33B	NA	569.55	12.23	557.32

Table 4.2: July 7, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	7/7/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
C-ZONE				
OBA-1C	NA	570.41	15.07	555.34
OBA-4C	NA	573.05	16.01	557.04
OBA-7C	NA	574.30	21.16	553.14
OBA-14C	NA	570.15	15.89	554.26
OBA-15B	NA	573.13	16.49	556.64
CD-ZONE				
OBA-2C	NA	572.43	17.40	555.03
OBA-3C	NA	572.67	17.98	554.69
OBA-5C	NA	572.01	17.01	555.00
OBA-6C	NA	570.35	14.42	555.93
OBA-8C	NA	573.14	21.01	552.13
OBA-11C	NA	572.94	17.02	555.92
Olin Production Well[2]	NA	NA	658	553.9

Notes:

1. The Gill Creek Stilling Well is monitored with a dedicated level transducer which collects hourly elevation measurements. The water elevation shown and used to prepare the A-Zone potentiometric surface map is the average hourly elevation for the date shown.

2. The Olin Production Well water elevation is calculated based on the production well flow rate using an empirical formula presented in the 1994 Remedial Facility Investigation. The flow rate is shown in place of the depth to water.

3. The orange highlighted water elevations are at or below the bottom of the A-Zone. A-Zone bottom elevations were used for these wells on the A-Zone potentiometric surface map.

4. Water elevations from the A/B-Zone wells with red text were used for the A-Zone potentiometric surface map. Pumping well piezometers (green text) were used for both A-Zone and B-Zone potentiometric surface maps.

5. The blue highlighted wells were not used when preparing the B-Zone potentiometric surface map. These appear to be poorly or not connected to the B-Zone based on their typical water elevations which are more than 2 feet higher than the average B-Zone elevation.

6. June 30, 2015 water levels for A-Zone & B-Zone Solvent wells located on Olin property between Gill Creek and Dupont Road were taken from Solvent's 2nd Quarter 2015 Report and used for the A-Zone and B-Zone potentiometric surface maps.

Prepared by: A. Nelson 02/26/2016
Checked by: T. Englund 03/04/2016

Table 4.3: October 6, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	10/6/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A-ZONE - OLIN				
OBA-1A	562.33	570.67	4.08	566.59
OBA-2A	561.32	572.54	10.41	561.32
OBA-3A	552.36	572.07	14.98	557.09
OBA-4A	558.34	572.42	12.49	559.93
OBA-5A	557.72	571.72	7.70	564.02
OBA-6A	561.01	570.17	5.61	564.56
OBA-7A	562.71	573.39	8.15	565.24
OBA-8A	559.59	572.49	11.74	560.75
OBA-9A	558.01	569.24	6.78	562.46
OBA-9AR	557.28	570.22	12.96	557.26
OBA-10A	552.15	568.39	5.15	563.24
OBA-11A	558.76	572.83	13.04	559.79
OBA-14A	552.44	570.67	13.83	556.84
OBA-15A	551.06	572.59	15.40	557.19
OBA-16A	560.42	573.26	11.03	562.23
OBA-18A	559.18	573.47	13.23	560.24
OBA-19A	558.08	573.86	13.38	560.48
OBA-23A	560.94	570.19	7.15	563.04
OBA-24A	557.76	568.95	6.97	561.98
OBA-25A	558.07	569.02	5.52	563.50
OBA-26A	557.28	569.55	6.41	563.14
PN-1A	560.21	570.51	DRY	DRY
PN-2A	561.41	570.64	7.10	563.54
PN-3A	560.12	571.80	9.49	562.31
PN-4A	558.94	568.35	7.22	561.13
PN-5A	558.95	568.55	6.84	561.71
PN-6A	559.06	568.43	7.36	561.07
PN-7A	558.52	568.23	5.11	563.12
PN-8A	557.53	568.28	4.81	563.47
PN-9A	558.97	570.74	10.42	560.32
PN-10A	561.35	570.11	DRY	DRY
PN-11A	557.78	567.49	10.30	557.19
PN-12A	558.85	570.07	12.50	557.57
PN-13A	559.98	573.25	15.01	558.24
PN-14A	560.62	573.30	8.73	564.57
PN-15A	559.44	570.69	7.38	563.31
PN-16A	560.17	570.44	8.20	562.24
PN-17A	560.32	570.55	6.50	564.05
PN-18A	561.55	570.23	7.92	562.31
PN-19A	562.00	570.74	7.40	563.34
PN-20A	558.35	570.07	8.87	561.20
PN-21A	558.77	569.48	4.82	564.66
Gill Creek Stilling Well[1]	NA	571.48	NA	563.46

Table 4.3: October 6, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	10/6/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A-ZONE - SOLVENT[6]				
OW-5A	NA	573.05	DRY	DRY
OW-6A	NA	572.10	9.72	562.38
OW-20A	NA	572.62	11.98	560.64
OW-21A	NA	569.33	DRY	DRY
OW-22A	NA	570.68	12.38	558.30
A/B-ZONE[4,5]				
PR-1	561.70	572.29	9.15	563.14
PR-1-PZ	561.70	571.15	7.61	563.54
PR-2	561.17	572.21	15.01	557.20
PR-2-PZ	561.17	572.17	15.10	557.07
PR-3	557.65	572.39	14.97	557.42
PR-3-PZ	557.65	571.69	14.50	557.19
PR-4	556.58	569.66	13.05	556.61
PR-4-PZ	556.58	569.65	12.96	556.69
PR-5	558.47	570.18	12.70	557.48
PR-5-PZ	558.47	569.23	11.68	557.55
PR-6	559.35	568.28	10.59	557.69
PR-7	558.56	568.57	6.97	561.60
PR-8	558.91	567.97	9.39	558.58
PR-9	556.16	568.39	8.45	559.94
PR-10	558.38	568.16	7.23	560.93
PR-11	558.31	567.53	4.70	562.83
PR-12	558.37	569.28	12.31	556.97
PR-13	559.15	568.69	9.83	558.86
PR-14	558.59	568.60	7.01	561.59
RW-1	560.93	573.22	16.39	556.83
RW-1-PZ	560.93	572.33	15.45	556.88
RW-2	559.03	572.01	14.81	557.20
RW-2-PZ	559.03	571.76	14.67	557.09
RW-3	556.69	569.40	12.46	556.94
RW-3-PZ	556.69	569.37	12.39	556.98
RW-4	557.05	569.27	12.37	556.90
RW-4-PZ	557.05	569.33	12.40	556.93
RW-5	556.81	569.28	12.58	556.70
RW-5-PZ	556.81	569.24	12.47	556.77
B-ZONE[5]				
OBA-1B	NA	570.35	9.23	561.12
OBA-2B	NA	572.63	15.51	557.12
OBA-4B	NA	573.03	15.91	557.12
OBA-5B	NA	572.29	12.65	559.64
OBA-6B	NA	570.31	5.66	564.65
OBA-7B	NA	573.97	10.63	563.34
OBA-8B	NA	572.64	13.57	559.07

Table 4.3: October 6, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	10/6/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
B-ZONE CONTINUED[5]				
OBA-11B	NA	572.87	16.32	556.55
OBA-14B	NA	570.76	13.71	557.05
OBA-16B	NA	572.99	16.43	556.56
OBA-23B	NA	570.04	11.50	558.54
OBA-24B	NA	568.76	11.46	557.30
OBA-25B	NA	568.93	11.13	557.80
OBA-26B	NA	569.65	12.09	557.56
PN-1B	NA	570.32	11.16	559.16
PN-2B	NA	570.44	13.35	557.09
PN-3B	NA	571.73	13.79	557.94
PN-4B	NA	568.46	11.33	557.13
PN-5B	NA	568.58	11.54	557.04
PN-6B	NA	568.56	11.48	557.08
PN-7B	NA	568.45	10.96	557.49
PN-8B	NA	567.85	10.86	556.99
PN-9B	NA	570.68	13.59	557.09
PN-10B	NA	571.15	13.87	557.28
PN-11B	NA	567.78	10.01	557.77
PN-12B	NA	570.00	5.22	564.78
PN-13B	NA	573.24	7.98	565.26
PN-14B	NA	573.30	9.85	563.45
PN-15B	NA	570.70	13.30	557.40
PN-16B	NA	570.36	9.53	560.83
PN-17B	NA	570.54	12.98	557.56
PN-18B	NA	570.50	12.54	557.96
PN-19B	NA	570.64	10.42	560.22
PN-20B	NA	569.70	12.67	557.03
PN-21B	NA	569.39	10.69	558.70
PN-22B	NA	569.08	NM	NM
PN-23B	NA	568.90	NM	NM
PN-24B	NA	570.87	13.60	557.27
B-ZONE - SOLVENT[6]				
PW-3B	NA	571.21	14.11	557.10
PW-4B	NA	569.72	12.49	557.23
OW-4B	NA	570.55	12.92	557.63
OW-14B	NA	570.87	13.35	557.52
OW-15B	NA	569.78	12.12	557.66
OW-22B	NA	570.90	13.43	557.47
OW-23B	NA	569.67	13.11	556.56
OW-24B	NA	570.36	12.95	557.41
OW-25B	NA	570.90	13.18	557.72
OW-31B	NA	570.14	13.14	557.00
OW-32B	NA	569.99	12.55	557.44
OW-33B	NA	569.55	12.18	557.37

Table 4.3: October 6, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	10/6/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
C-ZONE				
OBA-1C	NA	570.41	14.84	555.57
OBA-4C	NA	573.05	16.01	557.04
OBA-7C	NA	574.30	19.45	554.85
OBA-14C	NA	570.15	14.11	556.04
OBA-15B	NA	573.13	15.97	557.16
CD-ZONE				
OBA-2C	NA	572.43	17.10	555.33
OBA-3C	NA	572.67	18.93	553.74
OBA-5C	NA	572.01	16.69	555.32
OBA-6C	NA	570.35	14.28	556.07
OBA-8C	NA	573.14	20.68	552.46
OBA-11C	NA	572.94	17.22	555.72
Olin Production Well[2]	NA	NA	559	554.5

Notes:

1. The Gill Creek Stilling Well is monitored with a dedicated level transducer which collects hourly elevation measurements. The water elevation shown and used to prepare the A-Zone potentiometric surface map is the average hourly elevation for the date shown.

2. The Olin Production Well water elevation is calculated based on the production well flow rate using an empirical formula presented in the 1994 Remedial Facility Investigation. The flow rate is shown in place of the depth to water.

3. The orange highlighted water elevations are at or below the bottom of the A-Zone. A-Zone bottom elevations were used for these wells on the A-Zone potentiometric surface map.

4. Water elevations from the A/B-Zone wells with red text were used for the A-Zone potentiometric surface map. Pumping well piezometers (green text) were used for both A-Zone and B-Zone potentiometric surface maps.

5. The blue highlighted wells were not used when preparing the B-Zone potentiometric surface map. These appear to be poorly or not connected to the B-Zone based on their typical water elevations which are more than 2 feet higher than the average B-Zone elevation.

6. Water levels from A-Zone & B-Zone Solvent wells located on Olin property between Gill Creek and Dupont Road were measured and used for the A-Zone and B-Zone potentiometric surface maps.

Prepared by: A. Nelson 02/26/2016
Checked by: T. Englund 03/04/2016

Table 4.4: December 17, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	12/17/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A-ZONE - OLIN				
OBA-1A	562.33	570.67	4.89	565.78
OBA-2A	561.32	572.54	14.70	561.32
OBA-3A	552.36	572.07	7.99	564.08
OBA-4A	558.34	572.42	13.55	558.87
OBA-5A	557.72	571.72	7.61	564.11
OBA-6A	561.01	570.17	5.98	564.19
OBA-7A	562.71	573.39	8.52	564.87
OBA-8A	559.59	572.49	11.74	560.75
OBA-9A	558.01	569.24	7.09	562.15
OBA-9AR	557.28	570.22	10.06	560.16
OBA-10A	552.15	568.39	5.77	562.62
OBA-11A	558.76	572.83	13.03	559.80
OBA-14A	552.44	570.67	13.39	557.28
OBA-15A	551.06	572.59	15.02	557.57
OBA-16A	560.42	573.26	11.01	562.25
OBA-18A	559.18	573.47	13.25	560.22
OBA-19A	558.08	573.86	13.29	560.57
OBA-23A	560.94	570.19	8.28	561.91
OBA-24A	557.76	568.95	5.68	563.27
OBA-25A	558.07	569.02	5.65	563.37
OBA-26A	557.28	569.55	6.70	562.85
PN-1A	560.21	570.51	7.62	562.89
PN-2A	561.41	570.64	13.47	557.17
PN-3A	560.12	571.80	10.16	561.64
PN-4A	558.94	568.35	7.97	560.38
PN-5A	558.95	568.55	7.38	561.17
PN-6A	559.06	568.43	7.80	560.63
PN-7A	558.52	568.23	7.39	560.84
PN-8A	557.53	568.28	4.87	563.41
PN-9A	558.97	570.74	10.85	559.89
PN-10A	561.35	570.11	DRY	DRY
PN-11A	557.78	567.49	4.81	562.68
PN-12A	558.85	570.07	12.45	557.62
PN-13A	559.98	573.25	9.06	564.19
PN-14A	560.62	573.30	8.95	564.35
PN-15A	559.44	570.69	7.85	562.84
PN-16A	560.17	570.44	8.01	562.43
PN-17A	560.32	570.55	6.41	564.14
PN-18A	561.55	570.23	8.53	561.70
PN-19A	562.00	570.74	7.42	563.32
PN-20A	558.35	570.07	10.50	559.57
PN-21A	558.77	569.48	4.76	564.72
Gill Creek Stilling Well[1]	NA	571.48	NA	562.05

Table 4.4: December 17, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	12/17/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
A-ZONE - SOLVENT[6]				
OW-5A	NA	573.05	DRY	DRY
OW-6A	NA	572.10	9.75	562.35
OW-20A	NA	572.62	12.05	560.57
OW-21A	NA	569.33	DRY	DRY
OW-22A	NA	570.68	12.72	557.96
A/B-ZONE[4,5]				
PR-1	561.70	572.29	9.43	562.86
PR-1-PZ	561.70	571.15	8.10	563.05
PR-2	561.17	572.21	14.91	557.30
PR-2-PZ	561.17	572.17	14.75	557.42
PR-3	557.65	572.39	15.92	556.47
PR-3-PZ	557.65	571.69	14.55	557.14
PR-4	556.58	569.66	12.62	557.04
PR-4-PZ	556.58	569.65	12.90	556.75
PR-5	558.47	570.18	12.59	557.59
PR-5-PZ	558.47	569.23	11.30	557.93
PR-6	559.35	568.28	10.87	557.41
PR-7	558.56	568.57	8.72	559.85
PR-8	558.91	567.97	9.62	558.35
PR-9	556.16	568.39	8.65	559.74
PR-10	558.38	568.16	8.36	559.80
PR-11	558.31	567.53	4.70	562.83
PR-12	558.37	569.28	12.28	557.00
PR-13	559.15	568.69	11.03	557.66
PR-14	558.59	568.60	9.92	558.68
RW-1	560.93	573.22	15.20	558.02
RW-1-PZ	560.93	572.33	14.27	558.06
RW-2	559.03	572.01	14.92	557.09
RW-2-PZ	559.03	571.76	14.70	557.06
RW-3	556.69	569.40	12.32	557.08
RW-3-PZ	556.69	569.37	12.39	556.98
RW-4	557.05	569.27	12.27	557.00
RW-4-PZ	557.05	569.33	12.28	557.05
RW-5	556.81	569.28	12.45	556.83
RW-5-PZ	556.81	569.24	12.51	556.73
B-ZONE[5]				
OBA-1B	NA	570.35	15.37	554.98
OBA-2B	NA	572.63	15.78	556.85
OBA-4B	NA	573.03	15.70	557.33
OBA-5B	NA	572.29	13.07	559.22
OBA-6B	NA	570.31	5.81	564.50
OBA-7B	NA	573.97	10.88	563.09
OBA-8B	NA	572.64	15.03	557.61

Table 4.4: December 17, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	12/17/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
B-ZONE CONTINUED[5]				
OBA-11B	NA	572.87	17.51	555.36
OBA-14B	NA	570.76	13.92	556.84
OBA-16B	NA	572.99	15.70	557.29
OBA-23B	NA	570.04	11.97	558.07
OBA-24B	NA	568.76	10.92	557.84
OBA-25B	NA	568.93	11.69	557.24
OBA-26B	NA	569.65	12.31	557.34
PN-1B	NA	570.32	12.81	557.51
PN-2B	NA	570.44	DRY	DRY
PN-3B	NA	571.73	13.88	557.85
PN-4B	NA	568.46	11.42	557.04
PN-5B	NA	568.58	11.62	556.96
PN-6B	NA	568.56	11.55	557.01
PN-7B	NA	568.45	10.96	557.49
PN-8B	NA	567.85	10.84	557.01
PN-9B	NA	570.68	13.70	556.98
PN-10B	NA	571.15	13.75	557.40
PN-11B	NA	567.78	10.38	557.40
PN-12B	NA	570.00	5.28	564.72
PN-13B	NA	573.24	15.75	557.49
PN-14B	NA	573.30	10.10	563.20
PN-15B	NA	570.70	13.30	557.40
PN-16B	NA	570.36	9.89	560.47
PN-17B	NA	570.54	12.85	557.69
PN-18B	NA	570.50	12.42	558.08
PN-19B	NA	570.64	9.36	561.28
PN-20B	NA	569.70	12.76	556.94
PN-21B	NA	569.39	10.87	558.52
PN-22B	NA	569.08	NM	NM
PN-23B	NA	568.90	NM	NM
PN-24B	NA	570.87	13.28	557.59
B-ZONE - SOLVENT[6]				
PW-3B	NA	571.21	17.80	553.41
PW-4B	NA	569.72	14.01	555.71
OW-4B	NA	570.55	13.30	557.25
OW-14B	NA	570.87	14.31	556.56
OW-15B	NA	569.78	12.50	557.28
OW-22B	NA	570.90	13.86	557.04
OW-23B	NA	569.67	12.71	556.96
OW-24B	NA	570.36	13.29	557.07
OW-25B	NA	570.90	13.67	557.23
OW-31B	NA	570.14	12.70	557.44
OW-32B	NA	569.99	12.76	557.23
OW-33B	NA	569.55	12.51	557.04

Table 4.4: December 17, 2015 Water Elevations

Well	A-Zone Bottom Elevation (feet)	Reference Point Elevation (feet)	12/17/2015	
			Depth to Water (feet btoc)	Water Elevation[3] (feet)
C-ZONE				
OBA-1C	NA	570.41	16.07	554.34
OBA-4C	NA	573.05	16.11	556.94
OBA-7C	NA	574.30	20.15	554.15
OBA-14C	NA	570.15	16.79	553.36
OBA-15B	NA	573.13	16.20	556.93
CD-ZONE				
OBA-2C	NA	572.43	17.62	554.81
OBA-3C	NA	572.67	15.06	557.61
OBA-5C	NA	572.01	17.74	554.27
OBA-6C	NA	570.35	13.78	556.57
OBA-8C	NA	573.14	21.96	551.18
OBA-11C	NA	572.94	20.06	552.88
Olin Production Well[2]	NA	NA	693	553.7

Notes:

1. The Gill Creek Stilling Well is monitored with a dedicated level transducer which collects hourly elevation measurements. The water elevation shown and used to prepare the A-Zone potentiometric surface map is the average hourly elevation for the date shown.

2. The Olin Production Well water elevation is calculated based on the production well flow rate using an empirical formula presented in the 1994 Remedial Facility Investigation. The flow rate is shown in place of the depth to water.

3. The orange highlighted water elevations are at or below the bottom of the A-Zone. A-Zone bottom elevations were used for these wells on the A-Zone potentiometric surface map.

4. Water elevations from the A/B-Zone wells with red text were used for the A-Zone potentiometric surface map. Pumping well piezometers (green text) were used for both A-Zone and B-Zone potentiometric surface maps.

5. The blue highlighted wells were not used when preparing the B-Zone potentiometric surface map. These appear to be poorly or not connected to the B-Zone based on their typical water elevations which are more than 2 feet higher than the average B-Zone elevation.

6. Water levels from A-Zone & B-Zone Solvent wells located on Olin property between Gill Creek and Dupont Road were measured and used for the A-Zone and B-Zone potentiometric surface maps.

Prepared by: A. Nelson 02/26/2016
Checked by: T. Englund 03/04/2016

Table 5.1: June 2015 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample OBA-1A 6/29/2015	Sample OBA-1B 6/29/2015	Sample OBA-2B 6/17/2015	Sample OBA-3A 6/24/2015	Sample OBA-4A 6/29/2015	Sample OBA-4B 6/29/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	2.1	3.1	1.0 U	1.0 U
1,1,2-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	1.0 U	3.0	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	1.0 U	67	15	150	1.0 U	23
Methylene chloride (Dichloromethane)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	1.0 U	78	22	26	5.1	1.0 U
trans-1,2-Dichloroethene	1.0 U	1.9	1.0 U	2.8	1.0 U	1.0 U
Trichloroethene (TCE)	1.0 U	120	28	67	12	1.9
Vinyl Chloride	1.0 U	25	1.0 U	9.0	1.0 U	12
Aromatic Compounds						
1,2,4-Trichlorobenzene	1.0 U	1.0 U	170	3.1	1.0 U	1.0 U
1,2-Dichlorobenzene	1.0 U	1.0 U	2.0	11	1.0 U	1.0 U
1,3-Dichlorobenzene	1.0 U	1.0 U	3.9	30	1.0 U	1.1
1,4-Dichlorobenzene	1.0 U	1.0 U	1.4	38	1.0 U	1.0 U
Benzene	1.0 U	2.1	1.0 U	3.0	1.0 U	1.7
Chlorobenzene	1.0 U	1.0 U	1.0 U	26	1.0 U	5.8
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	0.47 U	0.047 U	0.39	0.58	0.047 U	0.047 U
beta-BHC	9.2	0.17	0.19	0.30	0.047 U	0.081
delta-BHC	0.48 U	0.048 U	0.047 UJ	0.14	0.048 U	0.048 U
gamma-BHC (Lindane)	0.47 U	0.054	0.047 U	0.27	0.047 U	0.047 U
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	0.20 U	85	0.20 U	0.20 U	0.20 U	0.20 U

Notes:

U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
UJ - constituent not detected - reporting limit is estimated.
ug/L - micrograms per liter

Prepared by: S. Gallagher 09/15/2015
Checked by: T. Englund 09/15/2015

Table 5.1: June 2015 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample OBA-5A 6/30/2015	Sample OBA-5B 6/30/2015	Duplicate OBA-5B 6/30/2015	Sample OBA-6A 6/18/2015	Sample OBA-6B 6/18/2015	Sample OBA-8A 6/24/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	50 U	200 U	200 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	50 U	400	380	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	50 U	200 U	200 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	50 U	200 U	200 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	50 U	200 U	200 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	50 U	200 U	200 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	290	2500	2400	1.0 U	11	1.0 U
Methylene chloride (Dichloromethane)	50 U	200 U	200 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	420	7000	7100	1.0 U	62	1.2
trans-1,2-Dichloroethene	50 U	200 U	200 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	310	20000	20000	1.7	27	1.4
Vinyl Chloride	73	280	300	1.0 U	5.0	1.0 U
Aromatic Compounds						
1,2,4-Trichlorobenzene	6100	10000	10000	11	200	1.0 U
1,2-Dichlorobenzene	280	1200	1200	1.0 U	38	1.0 U
1,3-Dichlorobenzene	1200	1100	1200	1.0 U	18	1.0 U
1,4-Dichlorobenzene	910	2300	2300	1.0 U	36	1.0 U
Benzene	72	4400	4700	1.0 U	7.8	1.0 U
Chlorobenzene	200	4700	4800	1.0 U	5.2	1.0 U
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	190	660	490	0.047 U	0.047 U	0.050
beta-BHC	48	92	56	0.072	0.19	0.25
delta-BHC	9.6 U	24 U	24 U	0.047 U	0.047 U	0.047 U
gamma-BHC (Lindane)	110	460	390	0.047 U	0.047 U	0.047 U
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	0.37	0.20 U	0.20 U	0.20 U	1.92	0.20 U

Notes:

U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
UJ - constituent not detected - reporting limit is estimated.
ug/L - micrograms per liter

Prepared by: S. Gallagher 09/15/2015
Checked by: T. Englund 09/15/2015

Table 5.1: June 2015 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample OBA-8B 6/24/2015	Sample OBA-10A 6/30/2015	Sample OBA-11B 6/24/2015	Sample OBA-14A 6/24/2015	Sample OBA-14B 6/24/2015	Sample OBA-15A 6/24/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	50 U	20 U	50 U	1.0 U	1.0 U	2.0 U
1,1,2,2-Tetrachloroethane	50 U	20 U	50 U	1.0 U	1.0 U	2.0 U
1,1,2-Trichloroethane	50 U	20 U	50 U	1.0 U	1.0 U	2.0 U
1,1-Dichloroethene	50 U	20 U	50 U	1.0 U	1.0 U	2.0 U
Carbon tetrachloride	50 U	20 U	50 U	1.0 U	1.0 U	2.0 U
Chloromethane (Methyl chloride)	50 U	20 U	50 U	1.0 U	1.0 U	2.0 U
cis-1,2-Dichloroethene	50 U	20 U	6500	1.0 U	1.0 U	2.0 U
Methylene chloride (Dichloromethane)	50 U	20 U	50 U	1.0 U	1.0 U	2.0 U
Tetrachloroethene (PCE)	50 U	20 U	50 U	1.0 U	1.0 U	2.0 U
trans-1,2-Dichloroethene	50 U	20 U	60	1.0 U	1.0 U	2.0 U
Trichloroethene (TCE)	50 U	20 U	150	1.0 U	1.0 U	2.0 U
Vinyl Chloride	50 U	20 U	1600	1.0 U	1.0 U	2.0 U
Aromatic Compounds						
1,2,4-Trichlorobenzene	6000	1800	500	1.0 U	1.0 U	2.0 U
1,2-Dichlorobenzene	180	2000	50 U	1.0 U	1.0 U	39
1,3-Dichlorobenzene	290	670	56	1.0 U	1.0 U	160
1,4-Dichlorobenzene	65	1900	50 U	1.0 U	1.0 U	270
Benzene	50 U	490	50 U	1.0 U	1.0 U	86
Chlorobenzene	50 U	430	50 U	1.0 U	1.0 U	530
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	2.0	110	6.9	0.047 U	0.047 U	0.047 U
beta-BHC	1.0	7.4	0.99	0.047 U	0.047 U	0.047 U
delta-BHC	0.094 U	4.8 U	0.24 U	0.047 U	0.047 U	0.099
gamma-BHC (Lindane)	0.094 U	55	0.24 U	0.047 U	0.047 U	0.047 U
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

Notes:

U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
UJ - constituent not detected - reporting limit is estimated.
ug/L - micrograms per liter

Prepared by: S. Gallagher 09/15/2015
Checked by: T. Englund 09/15/2015

Table 5.1: June 2015 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample OBA-16A 6/17/2015	Sample OBA-16B 6/17/2015	Sample OBA-23A 6/30/2015	Sample OBA-23B 6/30/2015	Sample OBA-24A 6/29/2015	Sample OBA-24B 6/29/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	25 U
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	140
1,1,2-Trichloroethane	1.0 U	1.2	1.0 U	2.5 U	1.0 U	25 U
1,1-Dichloroethene	1.0 U	22	1.0 U	2.5 U	1.0 U	25 U
Carbon tetrachloride	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	25 U
Chloromethane (Methyl chloride)	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	25 U
cis-1,2-Dichloroethene	1.0 U	1700	1.0 U	12	1.5	3400
Methylene chloride (Dichloromethane)	1.0 U	1.0 U	1.0 U	2.5 U	1.0 U	25 U
Tetrachloroethene (PCE)	3.0	180	5.4	2.5 U	4.3	2400
trans-1,2-Dichloroethene	1.0 U	22	1.0 U	3.9	1.0 U	44
Trichloroethene (TCE)	3.7	1600	10	4.6	20	7500
Vinyl Chloride	1.0 U	140	1.0 U	3.2	1.0 U	540
Aromatic Compounds						
1,2,4-Trichlorobenzene	1.0 U	1900	1.0 U	1200	1.0 U	840
1,2-Dichlorobenzene	1.0 U	140	1.0 U	35	2.3	560
1,3-Dichlorobenzene	1.0 U	240	1.0 U	1100	5.5	160
1,4-Dichlorobenzene	1.0 U	140	1.0 U	750	12	480
Benzene	1.0 U	190	1.0 U	2.5 U	1.0 U	3500
Chlorobenzene	1.0 U	100	1.0 U	120	10	580
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	0.47 U	1.1	0.047 U	1.3	0.047 U	57
beta-BHC	16	7.6	0.057	0.40	0.047 U	11
delta-BHC	0.47 UJ	0.47 UJ	0.048 U	0.096 U	0.048 U	28
gamma-BHC (Lindane)	0.47 U	3.0	0.047 U	0.094 U	0.047 U	78
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	5.13	7.27	1.67	0.20 U	0.20 U	0.20 U

Notes:

U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
UJ - constituent not detected - reporting limit is estimated.
ug/L - micrograms per liter

Prepared by: S. Gallagher 09/15/2015
Checked by: T. Englund 09/15/2015

Table 5.1: June 2015 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample OBA-25A 6/25/2015	Sample OBA-25B 6/25/2015	Duplicate OBA-25B 6/25/2015	Sample OBA-26A 6/25/2015	Sample OBA-26B 6/25/2015	Sample PN-3A 6/22/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	8.2	4.3	3.7	2.3	6.5	1.0 U
Methylene chloride (Dichloromethane)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	4.5	1.0 U	1.0 U	1.0 U	1.0 U	1.2
trans-1,2-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	20	1.0 U	1.0 U	1.0 U	1.0 U	2.6
Vinyl Chloride	1.0 U	8.5	8.5	1.0 U	10	1.0 U
Aromatic Compounds						
1,2,4-Trichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U	3.0	1.0 U
1,2-Dichlorobenzene	1.0 U	4.5	5.5	1.0 U	110	1.0 U
1,3-Dichlorobenzene	1.0 U	4.4	5.7	1.0 U	140	1.0 U
1,4-Dichlorobenzene	1.0 U	11	13	1.0 U	300	1.0 U
Benzene	1.0 U	1.0 U	1.0 U	1.0 U	20	1.0 U
Chlorobenzene	1.0 U	14	17	1.0 U	890	1.0 U
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.47 U
beta-BHC	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	5.0
delta-BHC	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.47 U
gamma-BHC (Lindane)	0.047 U	0.047 U	0.047 U	0.047 U	0.047 U	0.47 U
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	5.01	0.20 U	0.20 U	0.20 U	0.20 U	8.32

Notes:

U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
UJ - constituent not detected - reporting limit is estimated.
ug/L - micrograms per liter

Prepared by: S. Gallagher 09/15/2015
Checked by: T. Englund 09/15/2015

Table 5.1: June 2015 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample PN-4A 6/22/2015	Sample PN-4B 6/22/2015	Duplicate PN-4B 6/22/2015	Sample PN-5A 6/22/2015	Sample PN-5B 6/22/2015	Sample PN-6A 6/22/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	50.0 U	1.0 U
1,1,2,2-Tetrachloroethane	1.0 U	7.4	7.9	1.0 U	8500	1.0 U
1,1,2-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U	50.0 U	1.0 U
1,1-Dichloroethene	1.0 U	1.6	1.8	1.0 U	50.0 U	1.0 U
Carbon tetrachloride	1.0 U	1.0 U	1.0 U	1.0 U	50.0 U	1.0 U
Chloromethane (Methyl chloride)	1.0 U	1.0 U	1.0 U	1.0 U	50.0 U	1.0 U
cis-1,2-Dichloroethene	1.0 U	450	420	1.0 U	1500	1.2
Methylene chloride (Dichloromethane)	1.0 U	1.0 U	1.0 U	1.0 U	50.0 U	1.0 U
Tetrachloroethene (PCE)	1.0 U	47	45	1.0 U	6500	3.4
trans-1,2-Dichloroethene	1.0 U	6.9	6.8	1.0 U	95	1.0 U
Trichloroethene (TCE)	1.6	52	49	1.0 U	8300	3.2
Vinyl Chloride	1.0 U	37	39	1.0 U	55	1.0 U
Aromatic Compounds						
1,2,4-Trichlorobenzene	1.0 U	1400	1400	1.0 U	8000	9.8
1,2-Dichlorobenzene	1.0 U	29	26	1.0 U	730	12
1,3-Dichlorobenzene	1.0 U	210	220	1.0 U	690	140
1,4-Dichlorobenzene	1.0 U	190	180	1.0 U	470	130
Benzene	1.0 U	11	11	1.0 U	2200	2.4
Chlorobenzene	1.0 U	44	44	1.0 U	1100	77
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	0.047 U	100	74	0.094 U	550	0.047 U
beta-BHC	0.43	10 J	5.5 J	3.1	47 U	0.33
delta-BHC	0.047 U	13 J	9.2 J	0.094 U	360	0.047 U
gamma-BHC (Lindane)	0.047 U	140	110	0.094 U	1300	0.047 U
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	0.20 U	1.63	1.87	0.20 U	1.62	7.32

Notes:

U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
UJ - constituent not detected - reporting limit is estimated.
ug/L - micrograms per liter

Prepared by: S. Gallagher 09/15/2015
Checked by: T. Englund 09/15/2015

Table 5.1: June 2015 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample PN-6B 6/22/2015	Sample PN-7A 6/23/2015	Sample PN-7B 6/23/2015	Sample PN-11A 6/23/2015	Sample PN-11B 6/23/2015	Sample PN-12A 6/18/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	50 U	1.0 U	20 U	1.0 U	610	1.0 U
1,1,2,2-Tetrachloroethane	73	1.0 U	20 U	1.0 U	7000	1.0 U
1,1,2-Trichloroethane	50 U	1.0 U	20 U	1.0 U	580	1.0 U
1,1-Dichloroethene	50 U	1.0 U	20 U	1.0 U	420	1.0 U
Carbon tetrachloride	50 U	1.0 U	20 U	1.0 U	250 U	1.0 U
Chloromethane (Methyl chloride)	50 U	1.0 U	20 U	1.0 U	250 U	1.0 U
cis-1,2-Dichloroethene	240	1.0 U	230	3.5	6100	1.2
Methylene chloride (Dichloromethane)	50 U	1.0 U	20 U	1.0 U	250 U	1.6
Tetrachloroethene (PCE)	840	14	110	2.4	22000	2.4
trans-1,2-Dichloroethene	50 U	1.0 U	20 U	1.0 U	450	1.0 U
Trichloroethene (TCE)	850	17	550	4.7	160000	3.7
Vinyl Chloride	50 U	1.0 U	20 U	1.6	780	1.0 U
Aromatic Compounds						
1,2,4-Trichlorobenzene	9600	1.0 U	3300	1.0 U	7700	3.7
1,2-Dichlorobenzene	620	1.0 U	120	1.0 U	2700	1.0 U
1,3-Dichlorobenzene	3500	1.0 U	330	1.2	590	14
1,4-Dichlorobenzene	2500	1.0 U	170	2.5	2400	12
Benzene	750	1.0 U	1200	2.5	510	7.8
Chlorobenzene	1100	1.0 U	230	1.0 U	750	13
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	270	0.94 U	230	0.35	360	0.047 U
beta-BHC	24 U	14	42	0.64	24 U	1.3
delta-BHC	29	0.94 U	16	0.10	24 U	0.047 UJ
gamma-BHC (Lindane)	340	0.94 U	210	0.40	370	0.047 U
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	1.53	0.27	0.51	0.96	0.62	0.20 U

Notes:

U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
UJ - constituent not detected - reporting limit is estimated.
ug/L - micrograms per liter

Prepared by: S. Gallagher 09/15/2015
Checked by: T. Englund 09/15/2015

Table 5.1: June 2015 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample PN-12B 6/18/2015	Sample PN-14A 6/18/2015	Sample PN-14B 6/18/2015	Sample PN-15A 6/17/2015	Sample PN-15B 6/17/2015	Duplicate PN-15B 6/18/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	100 U	10 U	50 U	2.5 U	100 U	25 U
1,1,2,2-Tetrachloroethane	220	10 U	50 U	2.5 U	100 U	25 U
1,1,2-Trichloroethane	100 U	10 U	50 U	2.5 U	100 U	25 U
1,1-Dichloroethene	100 U	10 U	50 U	2.5 U	100 U	25 U
Carbon tetrachloride	100 U	10 U	50 U	2.5 U	100 U	25 U
Chloromethane (Methyl chloride)	100 U	10 U	50 U	2.5 U	100 U	25 U
cis-1,2-Dichloroethene	1300	10 U	50 U	2.5 U	100 U	25 U
Methylene chloride (Dichloromethane)	100 U	10 U	50 U	2.5 U	100 U	25 U
Tetrachloroethene (PCE)	2400	10 U	50 U	2.5 U	110	25 U
trans-1,2-Dichloroethene	100 U	10 U	50 U	2.5 U	100 U	25 U
Trichloroethene (TCE)	4500	11	50 U	2.5 U	160	25 U
Vinyl Chloride	200	10 U	50 U	2.5 U	100 U	25 U
Aromatic Compounds						
1,2,4-Trichlorobenzene	17000	190	9400	8.2	17000	9000
1,2-Dichlorobenzene	990	10 U	390	6.6	480	400
1,3-Dichlorobenzene	1300	10 U	1800	170	2200	1900
1,4-Dichlorobenzene	410	10 U	3500	220	390	3800
Benzene	1500	10 U	50 U	7.1	100 U	25 U
Chlorobenzene	1300	10 U	360	410	100 U	400
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	270	0.42	62	0.047 U	150	63
beta-BHC	38	6.9	6.2	0.16	28	6.2
delta-BHC	9.4 U	0.24 UJ	4.7 UJ	0.047 UJ	4.7 UJ	4.7 U
gamma-BHC (Lindane)	55	0.24 U	4.7 U	0.047 U	4.7 U	4.7 U
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	1.88	1.15	1.86	0.20 U	4.33	1.78

Notes:

U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
UJ - constituent not detected - reporting limit is estimated.
ug/L - micrograms per liter

Prepared by: S. Gallagher 09/15/2015
Checked by: T. Englund 09/15/2015

Table 5.1: June 2015 Site Groundwater Analytical Results

Well ID: / Sample Date:	Sample PN-17A 6/23/2015	Sample PN-17B 6/23/2015	Sample PN-18A 6/23/2015	Sample PN-20A 6/22/2015	Sample PN-20B 6/22/2015	Duplicate PN-20B 6/22/2015
Volatile Organic Compound Concentrations - SW846 8260C µg/L						
Aliphatic Compounds						
1,1,1-Trichloroethane	1.0 U	100 U	1.0 U	1.0 U	50 U	50 U
1,1,2,2-Tetrachloroethane	1.0 U	100 U	1.0 U	1.0 U	350	350
1,1,2-Trichloroethane	1.0 U	100 U	1.0 U	1.0 U	50 U	50 U
1,1-Dichloroethene	1.0 U	100 U	1.0 U	1.0 U	50 U	50 U
Carbon tetrachloride	1.0 U	100 U	1.0 U	1.0 U	50 U	50 U
Chloromethane (Methyl chloride)	1.0 U	100 U	1.0 U	1.0 U	50 U	50 U
cis-1,2-Dichloroethene	1.0 U	100 U	1.0 U	1.1	230	230
Methylene chloride (Dichloromethane)	1.0 U	100 U	1.0 U	1.0 U	50 U	50 U
Tetrachloroethene (PCE)	1.0 U	100 U	6.8	9.9	4400	4300
trans-1,2-Dichloroethene	1.0 U	100 U	1.0 U	1.0 U	50 U	50 U
Trichloroethene (TCE)	1.0 U	100 U	14	16	1600	1600
Vinyl Chloride	1.0 U	100 U	1.0 U	1.0 U	50 U	50 U
Aromatic Compounds						
1,2,4-Trichlorobenzene	1.0 U	12000	1.0 U	1.0 U	55 J	220 J
1,2-Dichlorobenzene	1.8	1000	1.0 U	1.0 U	81	88
1,3-Dichlorobenzene	32	1600	1.0 U	1.0 U	50 UJ	87 J
1,4-Dichlorobenzene	8.2	1500	1.0 U	1.0 U	84 J	120 J
Benzene	1.0 U	100 U	1.0 U	1.0 U	50 U	50 U
Chlorobenzene	2.2	170	1.0 U	1.0 U	50 U	50 U
Pesticide Concentrations - SW846 8081 ug/L						
alpha-BHC	0.047 U	9.9	2.4 U	0.047 U	0.59	0.65
beta-BHC	0.10	13	42	0.25	0.28	0.28
delta-BHC	0.047 U	0.47 U	2.4 U	0.047 U	0.13	0.14
gamma-BHC (Lindane)	0.047 U	0.47 U	2.4 U	0.047 U	0.23	0.27
Total Metal Concentrations - SW846 7470 ug/L						
Total Mercury	40.2	8.99	1340	0.26	0.20 U	0.20 U

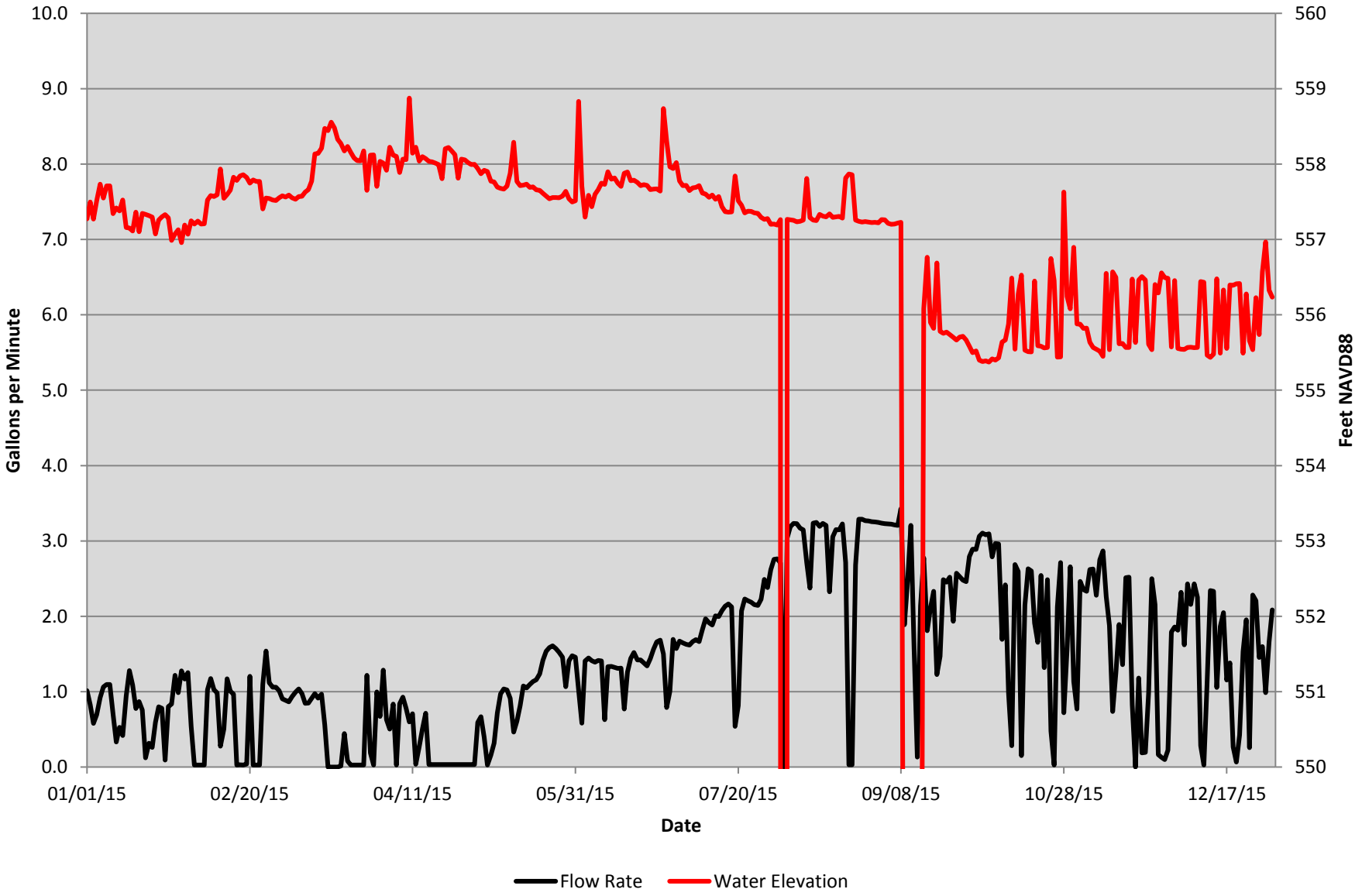
Notes:

U - constituent not detected - reporting limit shown.
J - consituent dectected below method reporting limit - concentration estimated.
UJ - constituent not detected - reporting limit is estimated.
ug/L - micrograms per liter

Prepared by: S. Gallagher 09/15/2015
Checked by: T. Englund 09/15/2015

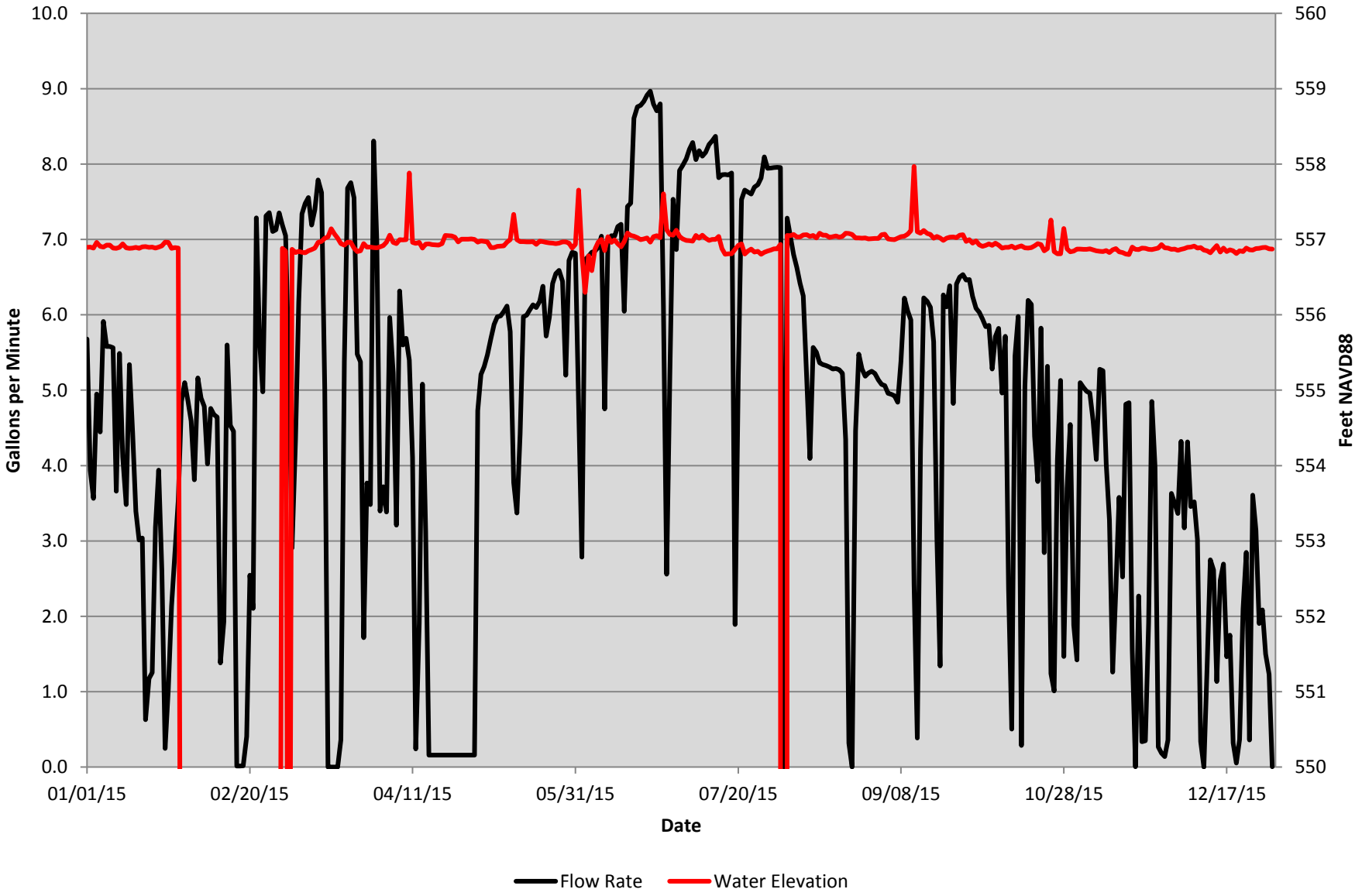
FIGURES

Figure 3.1: RW-1 Flow Rate and Water Elevation



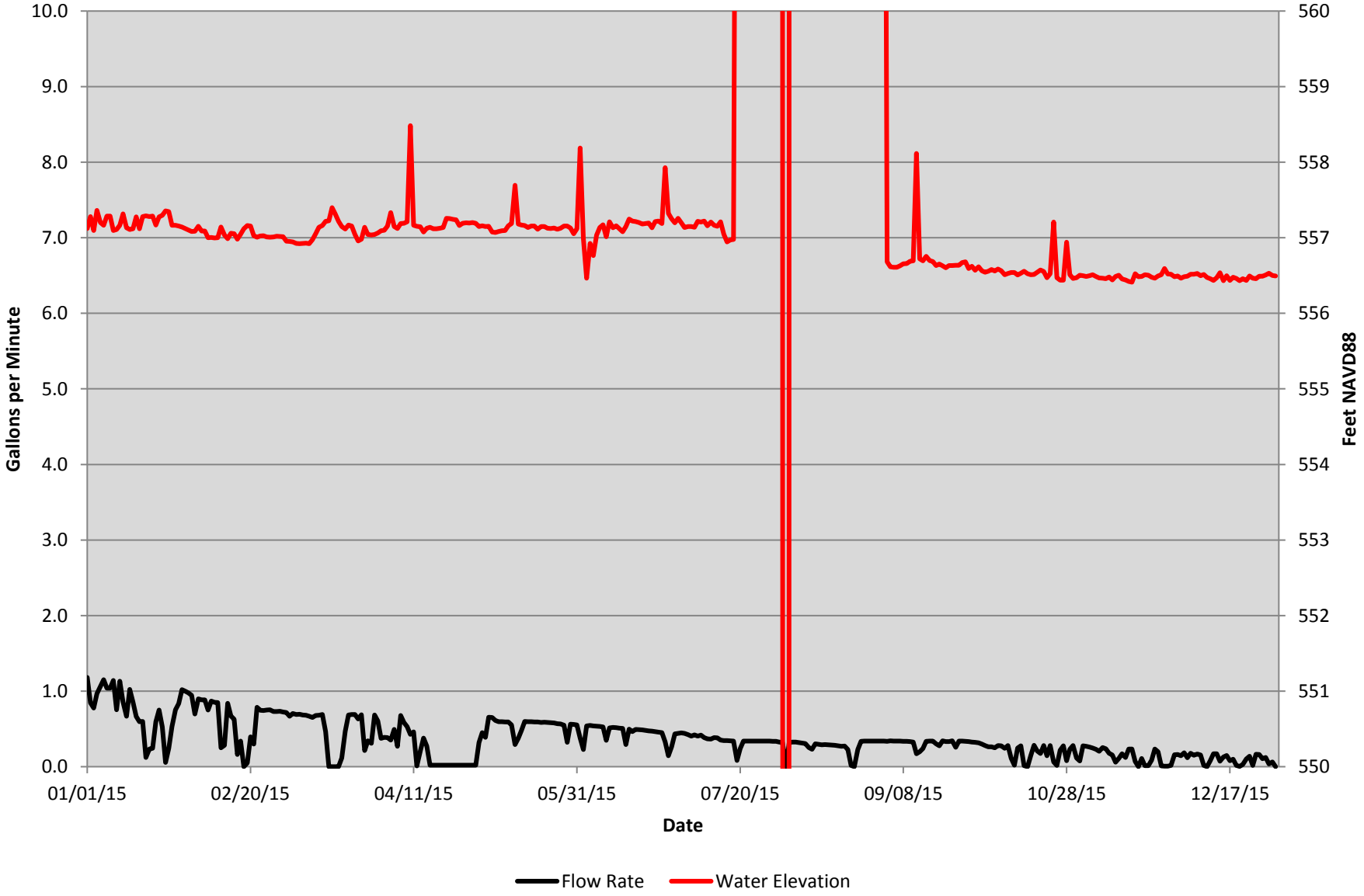
Prepared by: T. Donnell 01/13/2016
Checked by: A. Nelson 01/13/2016

Figure 3.2: RW-2 Flow Rate and Water Elevation



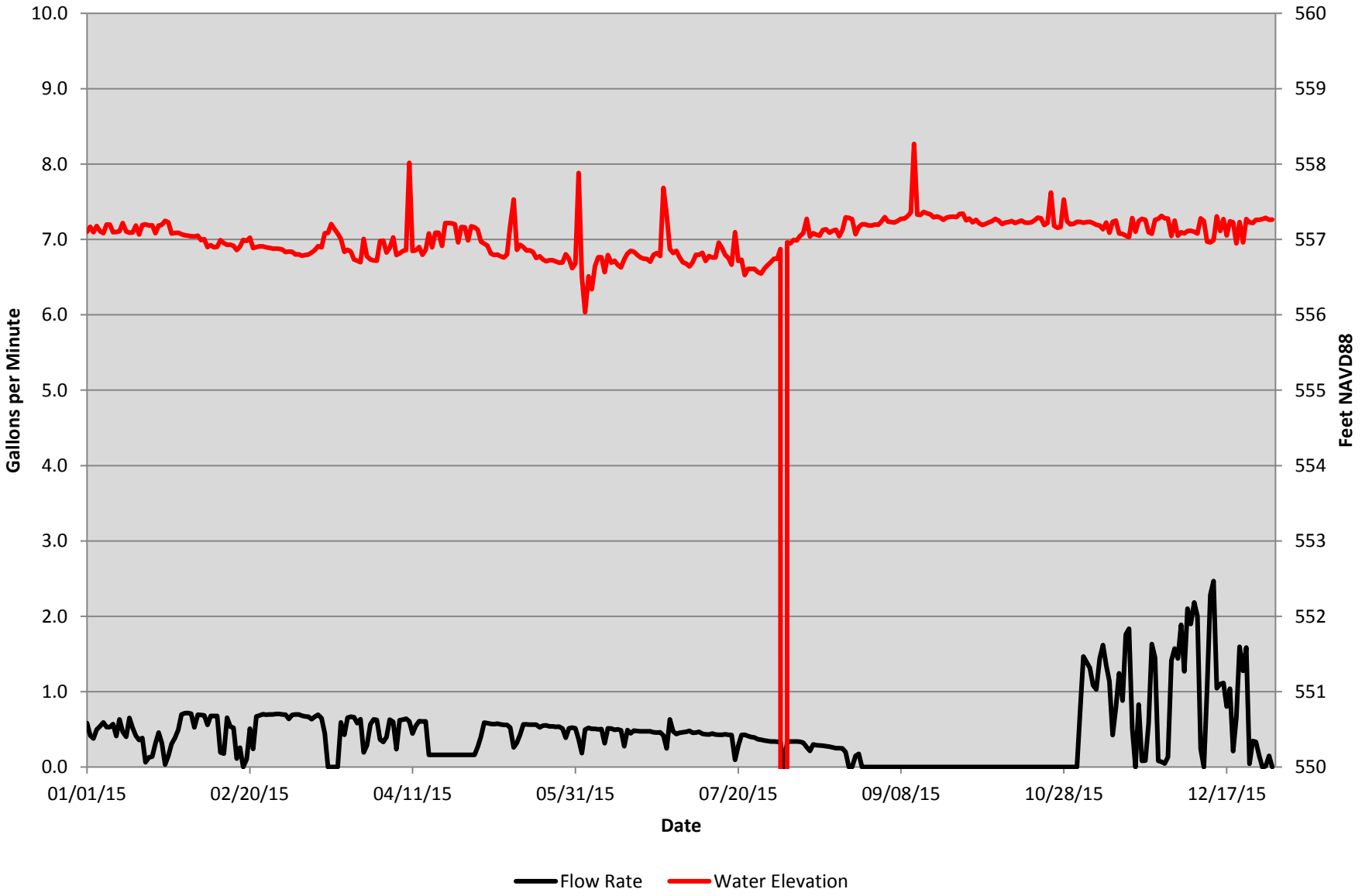
Prepared by: T. Donnell 01/13/2016
Checked by: A. Nelson 01/13/2016

Figure 3.3: RW-3 Flow Rate and Water Elevation



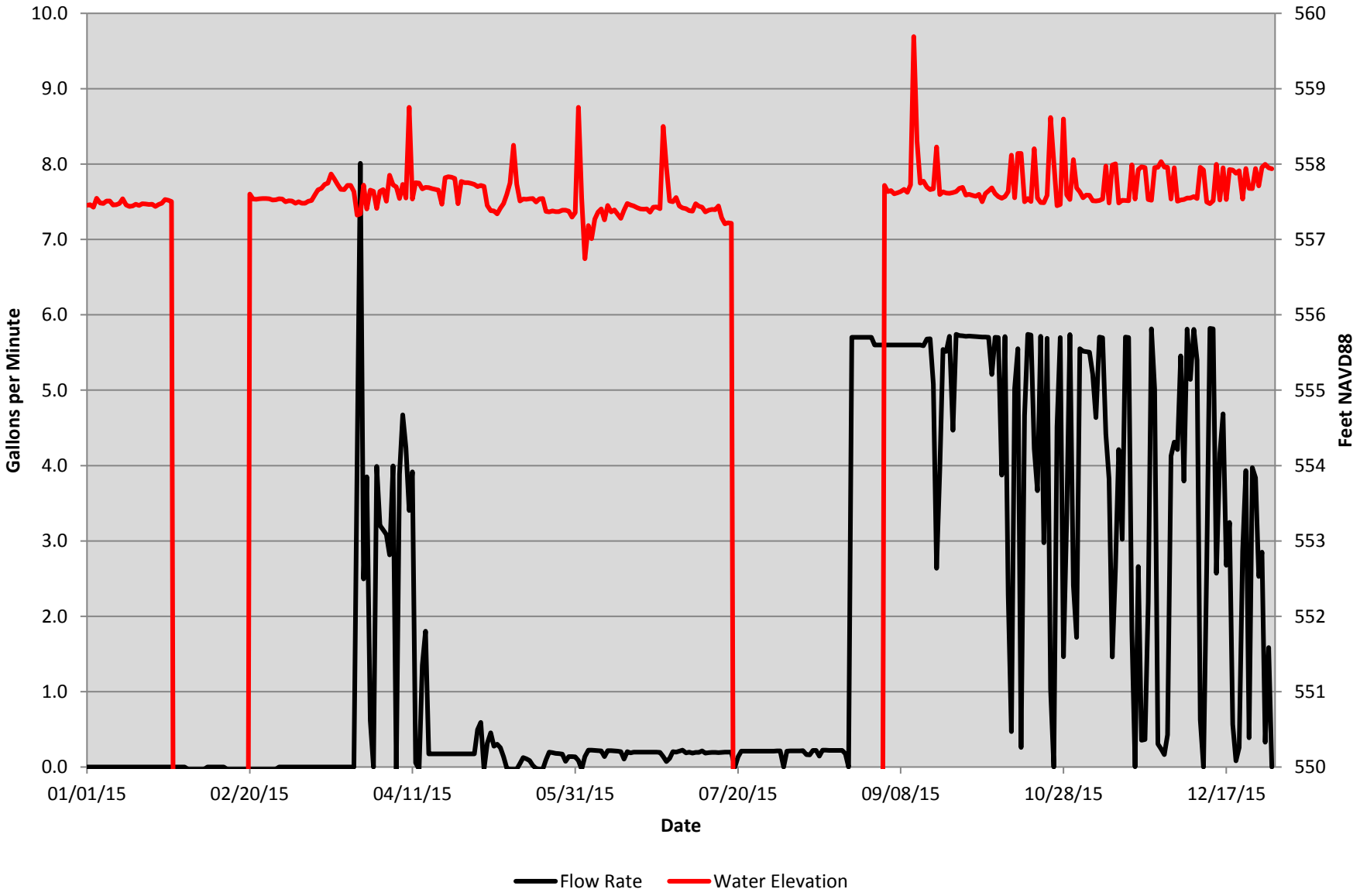
Prepared by: T. Donnell 01/13/2016
Checked by: A. Nelson 01/13/2016

Figure 3.4: RW-4 Flow Rate and Water Elevation



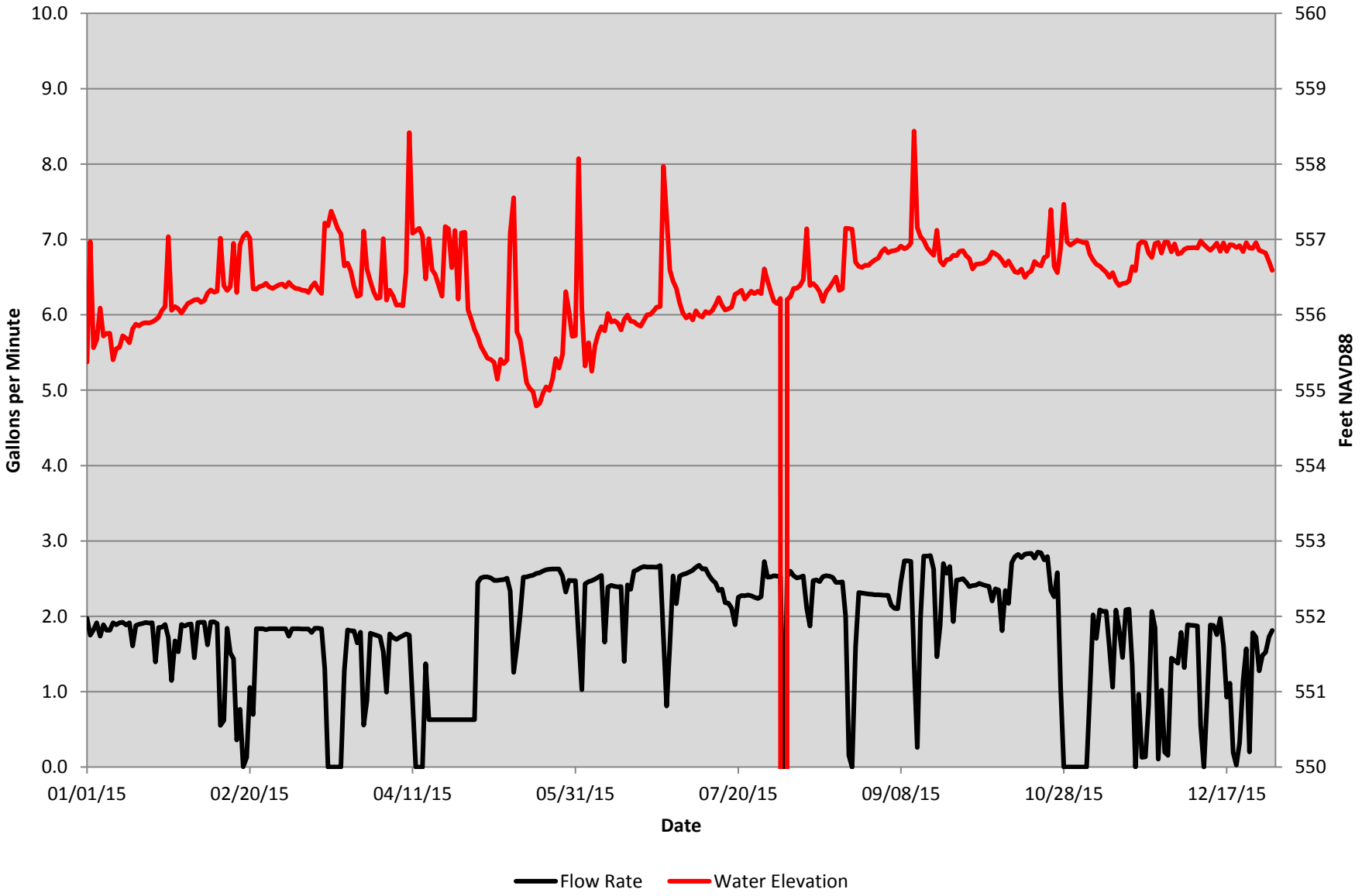
Prepared by: T. Donnell 01/13/2016
Checked by: A. Nelson 01/13/2016

Figure 3.5: RW-5 Flow Rate and Water Elevation



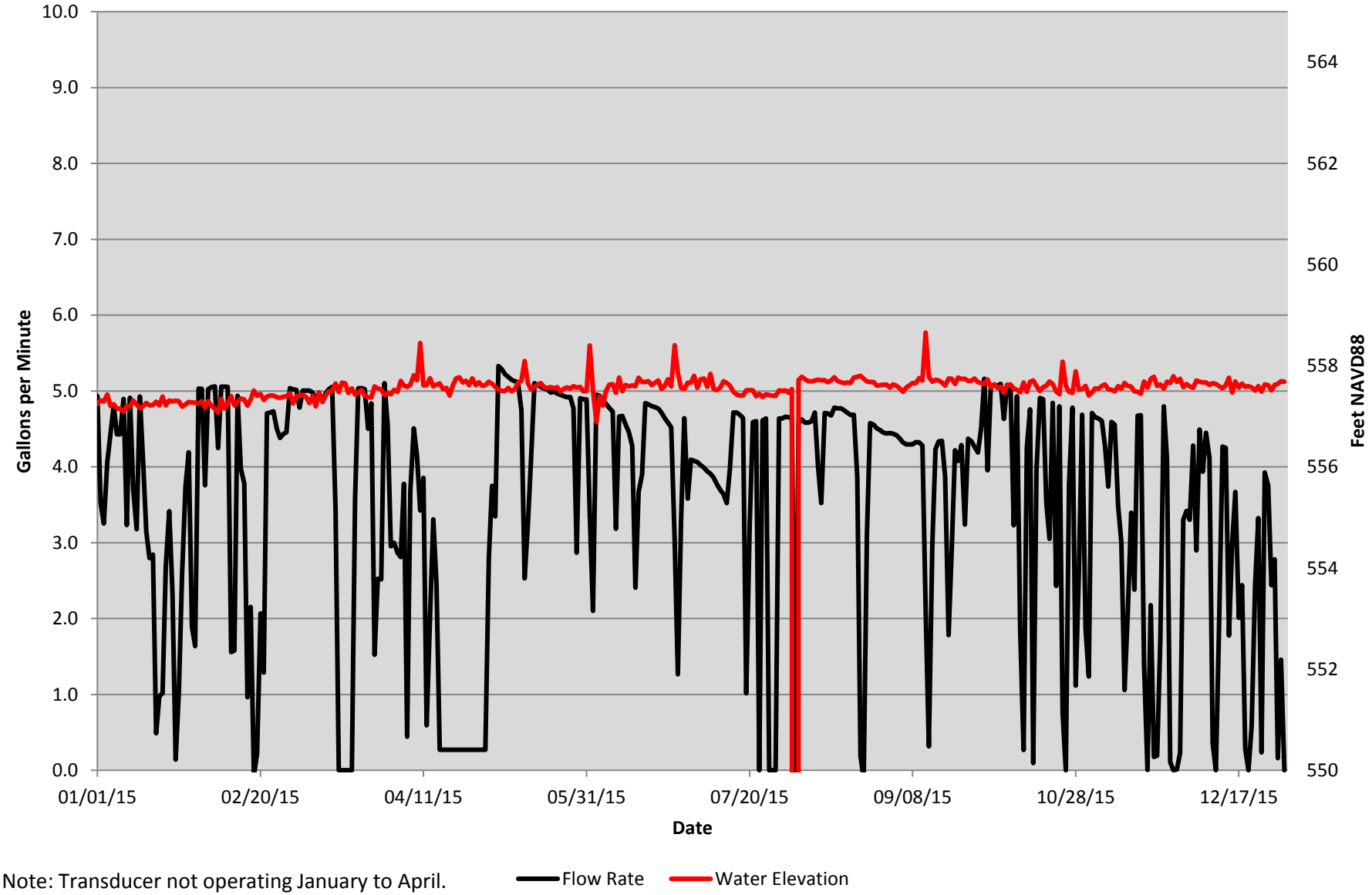
Prepared by: T. Donnell 01/13/2016
Checked by: A. Nelson 01/13/2016

Figure 3.6: PR-4 Flow Rate and Water Elevation



Prepared by: T. Donnell 01/13/2016
Checked by: A. Nelson 01/13/2016

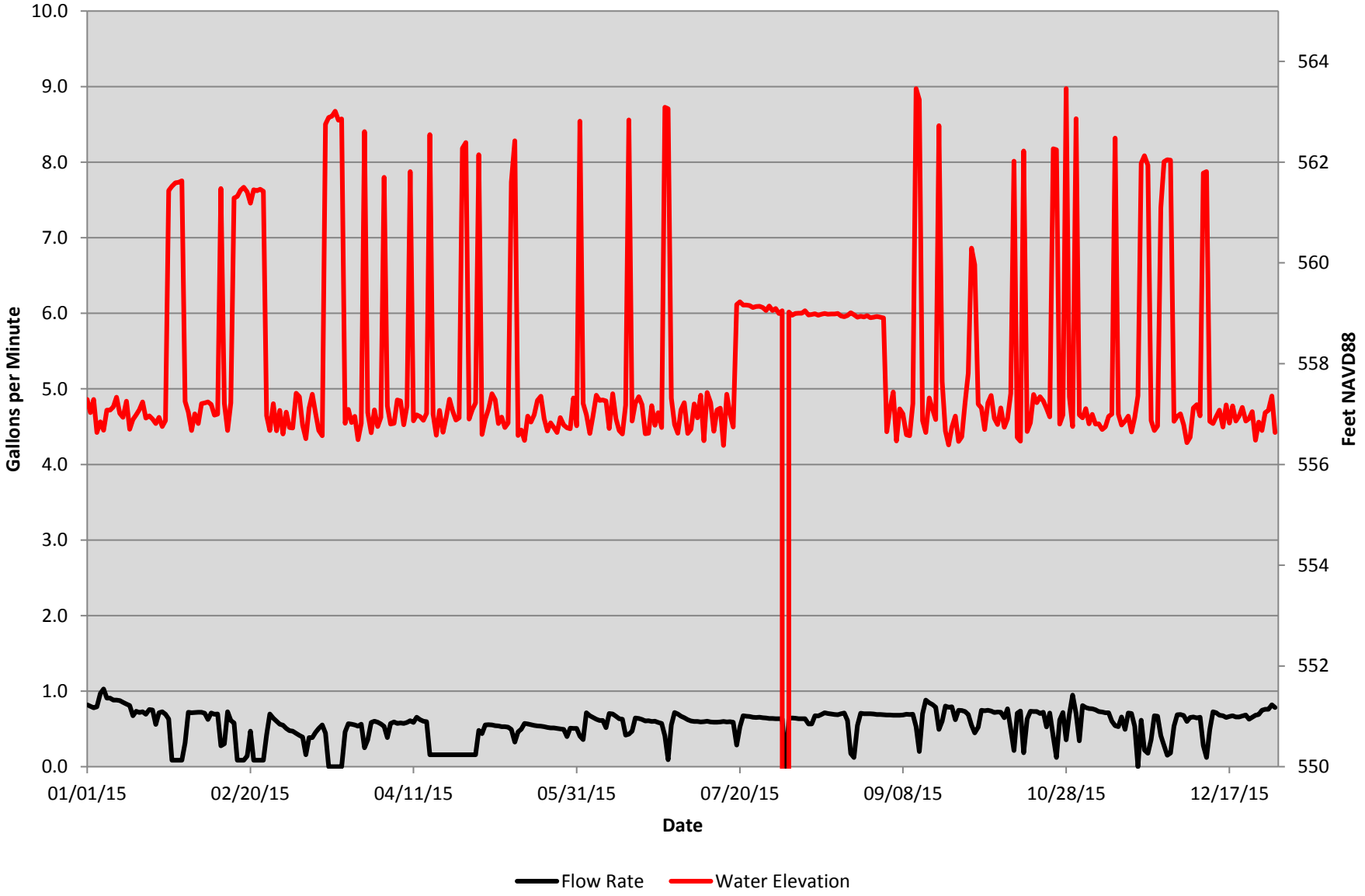
Figure 3.7: PR-12 Flow Rate and Water Elevation



Note: Transducer not operating January to April.

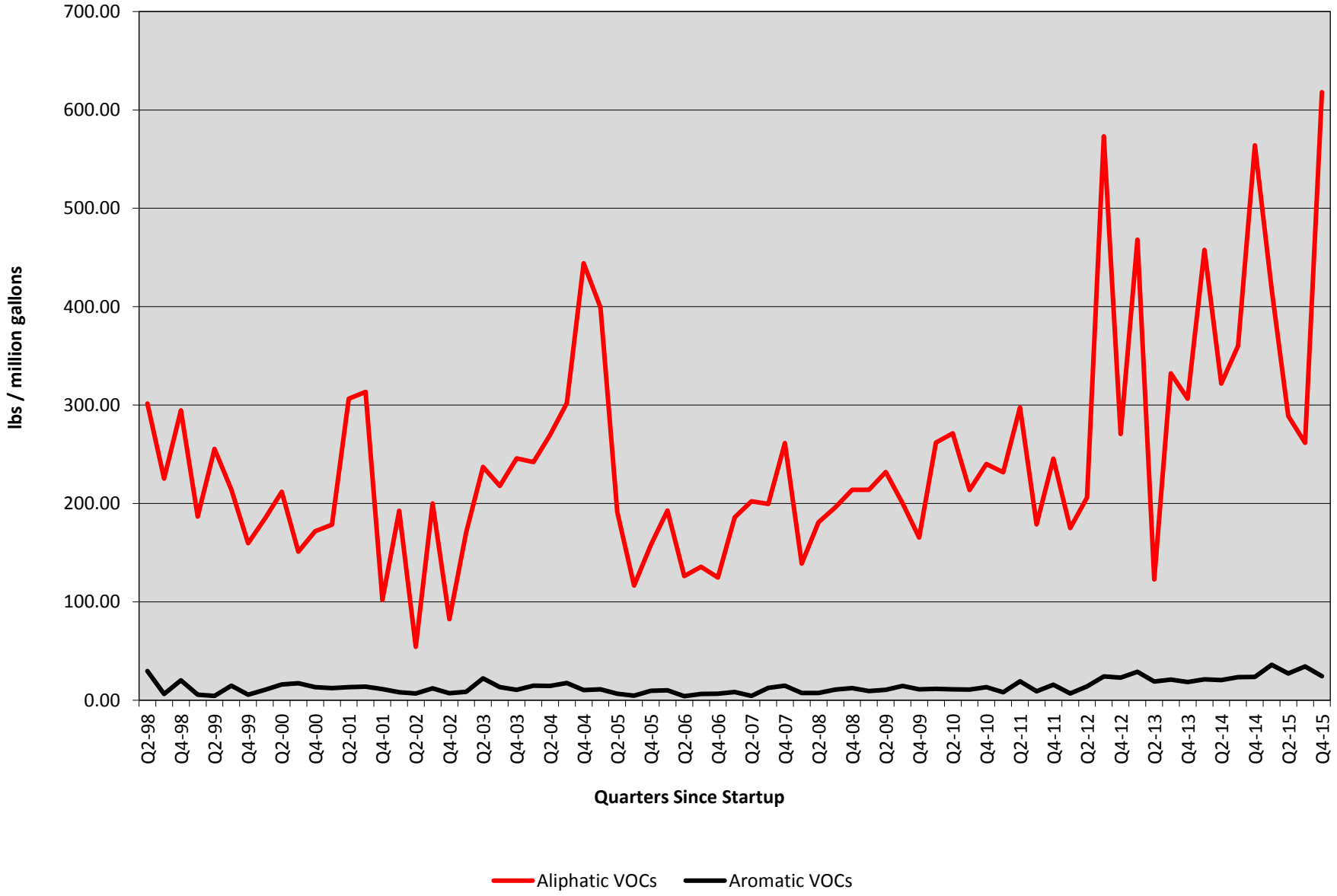
Prepared by: T. Donnell 01/13/2016
Checked by: A. Nelson 01/13/2016

Figure 3.8: OBA-9AR Flow Rate and Water Elevation



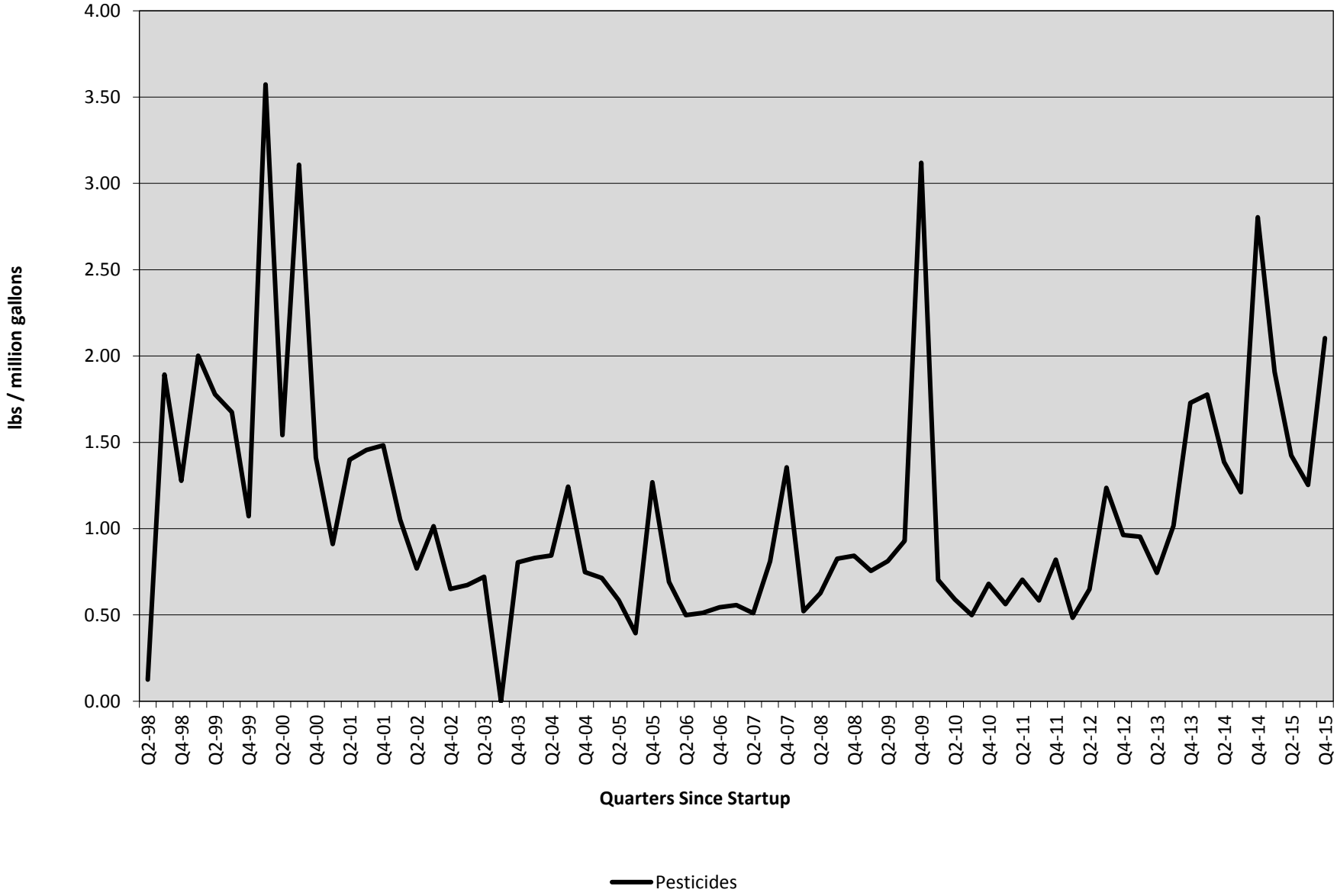
Prepared by: T. Donnell 01/13/2016
Checked by: A. Nelson 01/13/2016

Figure 3.9: Volatile Organic Compound Loading Rate



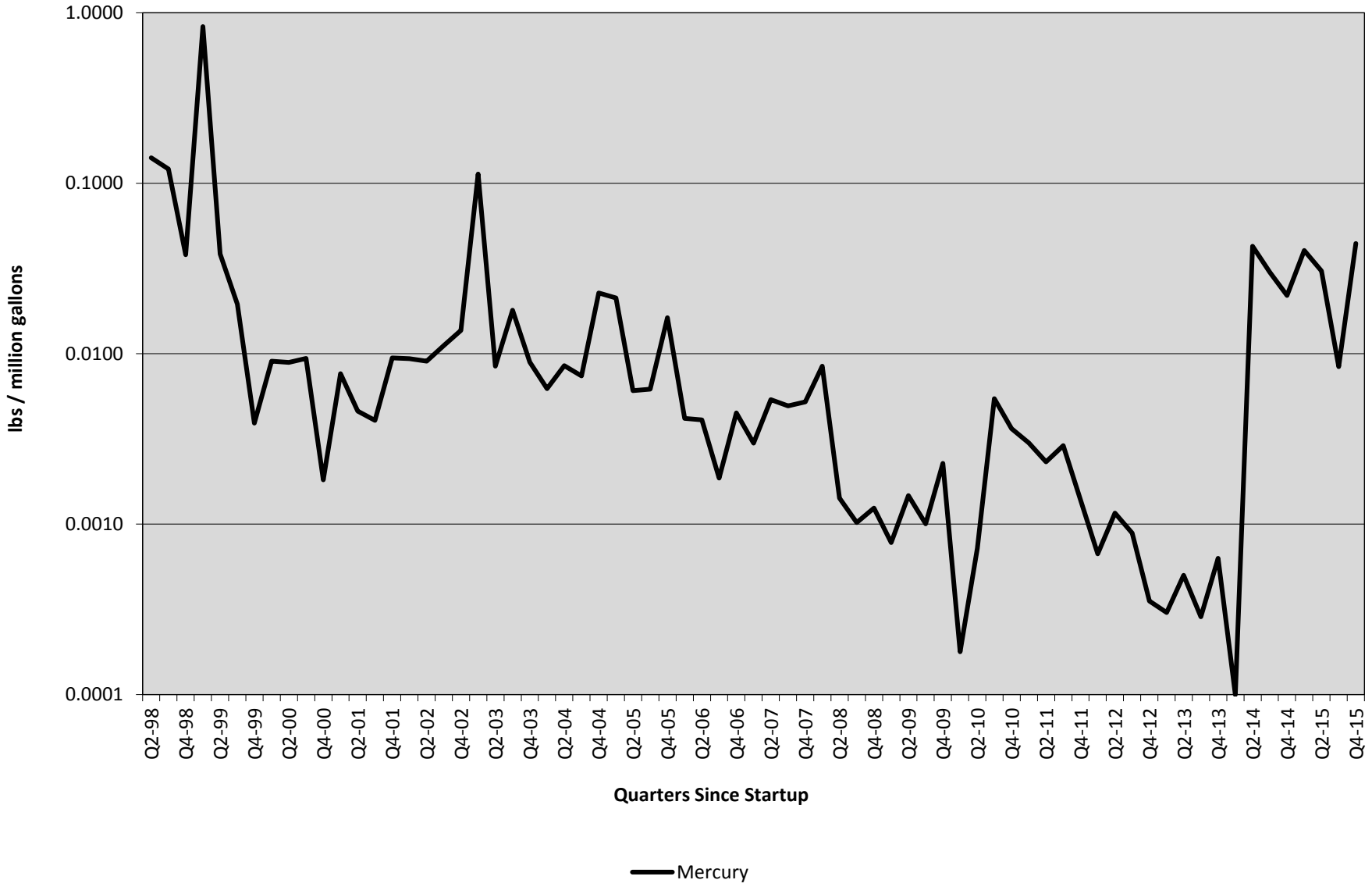
Prepared by: A. Nelson 02/29/2016
Checked by: S. Gallagher 03/02/2016

Figure 3.10: Pesticide Loading Rate



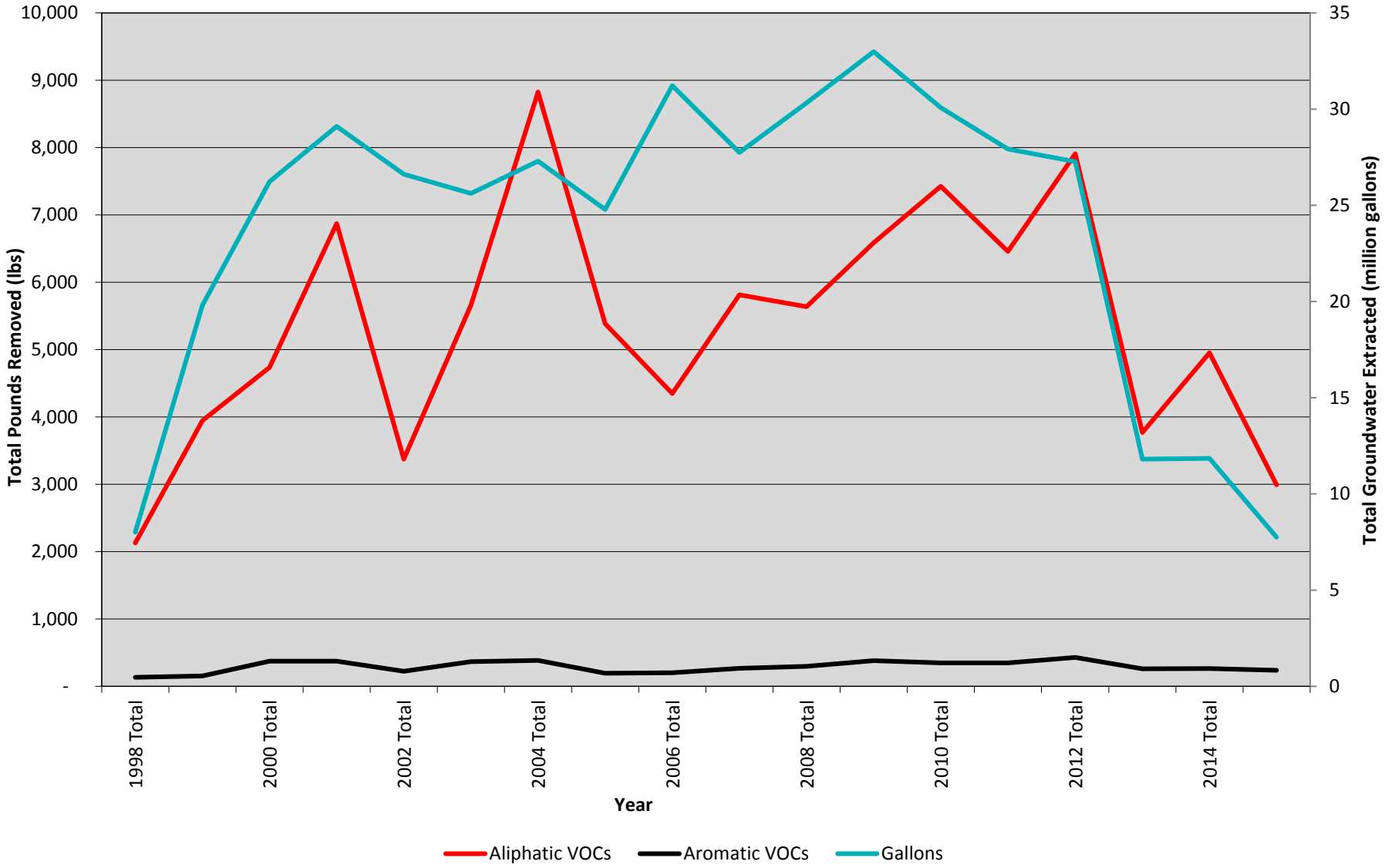
Prepared by: A. Nelson 02/29/2016
Checked by: S. Gallagher 03/02/2016

Figure 3.11: Mercury Loading Rate



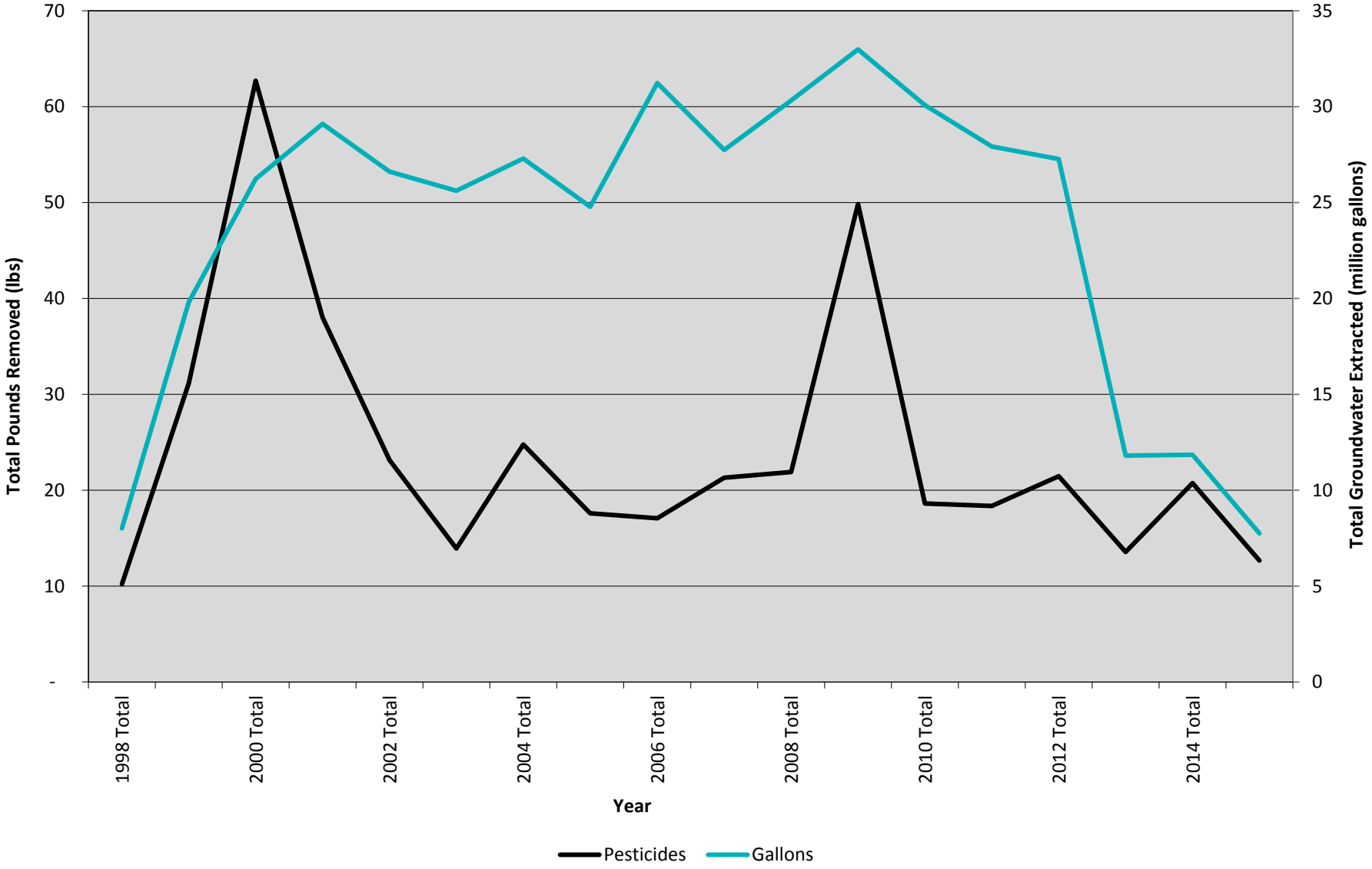
Prepared by: A. Nelson 02/29/2016
Checked by: S. Gallagher 03/02/2016

Figure 3.12: Volatile Organic Compound Mass Removal



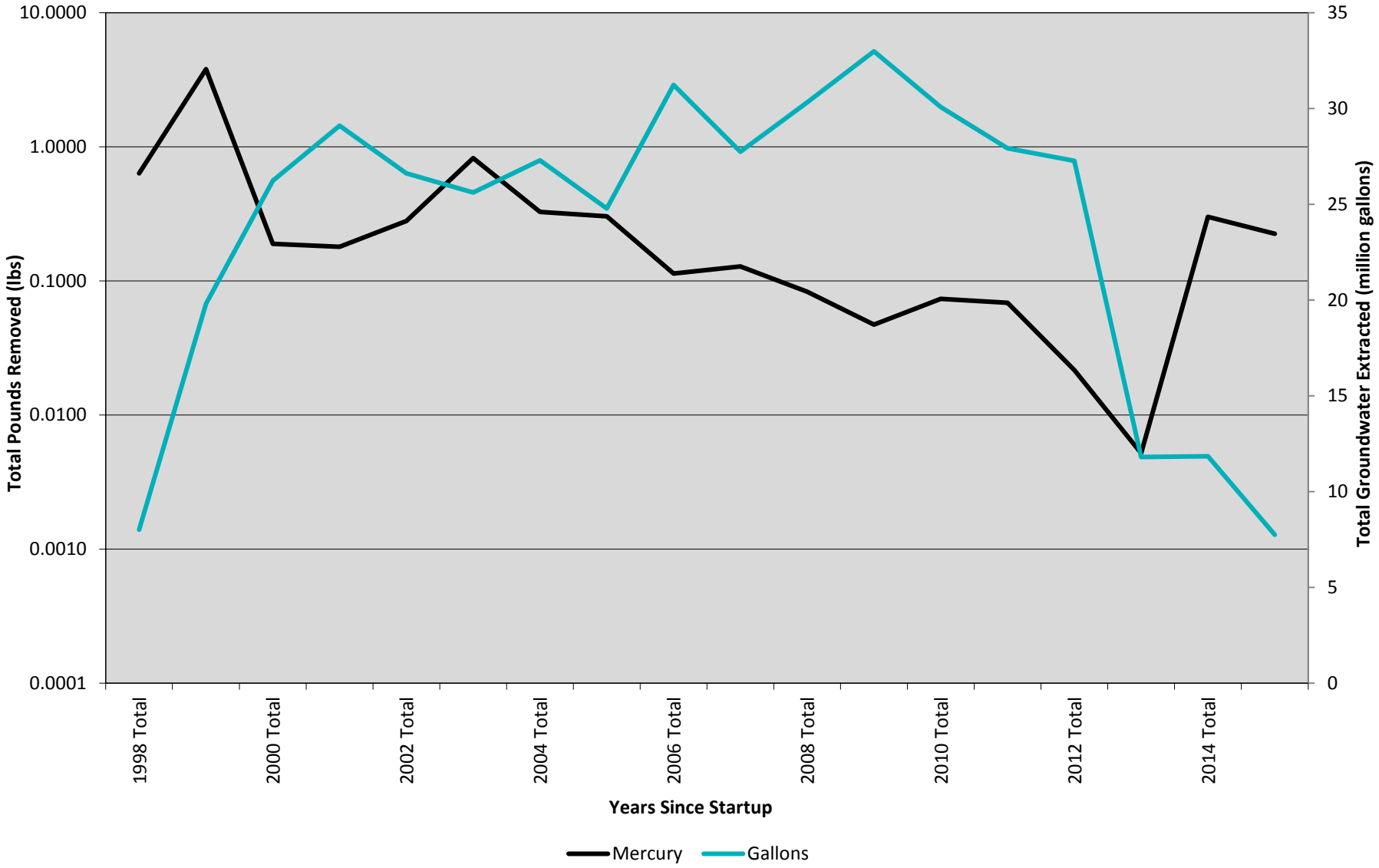
Prepared by: A. Nelson 02/29/2016
Checked by: S. Gallagher 03/02/2016

Figure 3.13: Pesticide Mass Removal



Prepared by: A. Nelson 02/29/2016
Checked by: S. Gallagher 03/02/2016

Figure 3.14: Mercury Mass Removal



Prepared by: A. Nelson 02/29/2016
Checked by: S. Gallagher 03/02/2016

Buffalo Avenue

OBA-11A 559.71
OBA-18A 560.32
OBA-19A 563.16
OBA-8A 562.04
OBA-1A 566.76
OBA-7A 566.34
OBW-3A 556.88
OW-21A DRY
OW-22A 564.96
OBA-15A 557.43
OW-5A 561.15
OW-6A 562.44
OW-20A 560.67
OBA-14A 557.26
OBA-4A 561.40
OBA-26A 563.26
OBA-24A 562.86
OBA-25A 564.01
OBA-2A 561.32
PN-10A 563.75
PN-20A 560.79
PN-9A 560.50
RW-2-PZ 559.03
PR-2 561.17
PN-2A 563.38
PR-3 557.65
OBA-16A 563.06
OBA-23A 562.50
RW-1-PZ 560.93
PN-19A 563.41
PN-18A 564.23
RW-3-PZ 556.98
PN-3A NM
PN-1A 564.11
PN-16A 563.99
PN-17A 565.49
PN-4 561.65
PR-1 564.48
PR-4-PZ 556.58
PR-13 559.15
PN-5A 562.00
PN-15A 563.94
RW-4-PZ 557.05
PR-6 559.94
PN-14A 564.99
PR-14 561.37
PR-7 560.91
OBA-6A 565.13
PN-6A 561.64
PN-13A 564.80
PR-8 559.27
PR-5 558.47
PR-9 559.70
PN-12A 565.26
PN-7A NM
PR-10 NM
RW-5-PZ 557.04
PN-21A 564.83
PR-11 564.11
OBA-5A 564.37
PN-8A 563.93
PN-11A 562.54
PR-12 558.37
OBA-9A 562.23
OBA-9AR 557.28
OBA-10A 562.46
Gill Creek - Stilling Well 562.08

Gill Creek

0 50 100 Feet

0 200 400 Feet

Notes:
1. The Gill Creek elevation is continuously monitored (1 hr intervals) using a data logging transducer installed in the Gill Creek Stilling well. The average daily elevation is used to extrapolate the levels along the creek and create a breakline in the contouring model.
2. Yellow Highlighted wells are dry or have water level elevations below the bottom of the A-Zone. Bottom of A-Zone elevation used in contouring for these wells.

Legend

- Olin Monitoring Well
- Olin Passive Relief Well
- Olin Recovery Well
- Olin Surface Water Monitoring Location
- Solvent Monitoring Well
- Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary
- Interpreted A Zone Dewatered Area (WL < 0.5 feet)

Recovery Well	Average Flow Rate (gpm)
RW-1	0.9
RW-2	5.6
RW-3	0.6
RW-4	0.6
RW-5	4.7
PR-4	1.7
PR-12	4.5
OBA-9AR	0.6

2015 Annual OMM Report

Olin Chemicals Plant Niagara Falls, NY

A Zone Potentiometric Contours April 8, 2015

Prepared By-Date: JRM - 03/01/2015
Checked By-Date: AWE - 03/01/2015
Project Number: 6107160002

amec foster wheeler

Figure: 4.1

Path: G:\olin_niagra\2015 OMM Report\mxds\Zone_A_April_2015.mxd

Buffalo Avenue

OBA-11A 559.82
OBA-18A 560.28
OBA-19A 561.92
OBA-1A 566.55
OBA-7A 564.28
OBA-8A 559.59
OBA-2A 561.32
OBA-4A 560.31
OBA-26A 563.34
OBA-24A 562.54
OBA-25A 563.77
OBA-14A 557.32
OBA-15A 557.48
OBA-6A 565.88
OBA-23A 561.78
OBA-5A 564.47
OBA-9A 562.76
OBA-9AR 557.93
OBA-10A 562.41
OW-21A 558.68
OBW-3A 557.29
OW-22A 561.40
OW-5A 560.87
OW-20A 560.50
OW-6A 562.29
PN-10A 561.35
PN-9A 561.46
PN-20A 561.96
PN-2A 564.66
PN-19A 563.39
PN-18A 564.16
PN-16A 564.66
PN-17A 564.54
PN-1A 560.21
PN-4A 562.15
PN-5A 562.15
PN-15A 563.51
PN-14A 565.34
PN-13A 565.34
PN-12A 564.96
PN-7A 562.26
PN-21A 564.59
PN-8A 563.75
PN-11A 563.34
PN-3A 566.09
PN-6A 561.63
RW-2-PZ 559.03
RW-3-PZ 557.05
RW-1-PZ 560.93
RW-4-PZ 557.05
RW-5-PZ 557.08
PR-2 561.17
PR-4-PZ 556.58
PR-13 559.15
PR-6 559.35
PR-7 559.87
PR-14 559.59
PR-8 559.17
PR-5 558.47
PR-9 560.38
PR-10 560.55
PR-11 563.42
PR-12 558.37
PR-1 564.99
Gill Creek - Stilling Well 562.08
Gill Creek

560 561 562 563 564 565 566 560.5 561.5 562.5 563.5 564.5 565.5

Notes:
1. The Gill Creek elevation is continuously monitored (1 hr intervals) using a data logging transducer installed in the Gill Creek Stilling well. The average daily elevation is used to extrapolate the levels along the creek and create a breakline in the contouring model.
2. Yellow Highlighted wells are dry or have water level elevations below the bottom of the A-Zone. Bottom of A-Zone elevation used in contouring for these wells.

0 50 100 Feet

0 200 400 Feet

Legend

- Olin Monitoring Well
- Olin Passive Relief Well
- Olin Recovery Well
- Olin Surface Water Monitoring Location
- Solvent Monitoring Well
- Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary
- Interpreted A Zone Dewatered Area (WL < 0.5 feet)

Recovery Well	Average Flow Rate (gpm)
RW-1	1.7
RW-2	8.1
RW-3	0.4
RW-4	0.5
RW-5	0.2
PR-4	2.6
PR-12	3.9
OBA-9AR	0.6

2015 Annual OMM Report

Olin Chemicals Plant Niagara Falls, NY

A Zone Potentiometric Contours July 7, 2015

Prepared By-Date: JRM - 03/03/2016
Checked By-Date: AWE - 03/03/2016
Project Number: 6107160002

amec foster wheeler

Figure: 4.2

Path: G:\olin_niagra\2015 OMM Report\mxds\Zone_A_July_2015.mxd

Buffalo Avenue

OBA-11A 559.79
OBA-18A 560.24
OBA-19A 560.48
OBA-1A 566.59
OBA-7A 565.24
OBA-8A 560.75
OBA-2A 562.13
OBA-23A 563.04
OBA-15A 557.19
OBW-3A 557.09
OW-21A DRY
OW-22A 558.30
OW-5A DRY
OW-6A 562.39
OW-20A 560.64
OBA-4A 559.93
OBA-14A 556.84
OBA-26A 563.14
OBA-24A 561.98
OBA-25A 563.50
PN-10A 561.35
PN-9A 560.32
PN-20A 561.20
RW-2-PZ 559.03
PR-2 561.17
PN-2A 563.54
PR-3 557.65
OBA-16A 562.23
RW-3-PZ 556.98
RW-1-PZ 560.93
PN-19A 563.34
PN-18A 562.31
PN-3A 562.31
PN-1A 560.21
PN-16A 562.24
PN-4A 561.13
PN-17A 564.05
PR-1 563.14
PR-4-PZ 556.69
PR-13 559.15
PN-5A 561.71
PR-6 559.35
PN-15A 563.31
RW-4-PZ 557.05
PR-7 561.60
PN-14A 564.57
PR-14 561.59
OBA-6A 564.56
PN-6A 561.07
PN-13A 565.27
PR-8 558.91
PR-5 558.47
PR-9 559.94
PN-7A 563.12
PN-12A 564.85
PR-10 560.93
RW-5-PZ 556.81
PN-21A 564.66
PR-11 562.83
PN-8A 563.47
OBA-5A 564.02
PR-12 558.37
PN-11A*
OBA-9AR 557.28
OBA-9A 562.46
OBA-10A 563.24
Gill Creek - Stilling Well 563.46
Gill Creek

0 50 100 Feet

0 200 400 Feet

Notes:
1. The Gill Creek elevation is continuously monitored (1 hr intervals) using a data logging transducer installed in the Gill Creek Stilling well. The average daily elevation is used to extrapolate the levels along the creek and create a breakline in the contouring model.
2. Yellow Highlighted wells are dry or have water level elevations below the bottom of the A-Zone. Bottom of A-Zone elevation used in contouring for these wells.

Legend
- Olin Monitoring Well
- Olin Passive Relief Well
- Olin Recovery Well
- Olin Surface Water Monitoring Location
- Solvent Monitoring Well
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Recovery Well	Average Flow Rate (gpm)
RW-1	2.8
RW-2	5.3
RW-3	0.3
RW-4	0
RW-5	5.2
PR-4	2.2
PR-12	4.6
OBA-9AR	0.719

2015 Annual OMM Report

Olin Chemicals Plant Niagara Falls, NY

A Zone Potentiometric Contours October 6, 2015

Prepared By-Date: JRM - 03/03/2015
Checked By-Date: AWE - 03/03/2015
Project Number: 6107160002

amec foster wheeler

Figure: 4.3

Path: G:\olin niagra\2015 OMM Report\mxds\Zone A Oct 2015.mxd

Buffalo Avenue

OBA-11A 559.8
OBA-18A 560.22
OBA-19A 560.57
OBA-8A 560.75
OBA-1A 565.78
OBA-7A 564.87
OBA-15A 557.57
OBW-3A 564.08
OW-21A DRY
OW-22A 557.96
OW-5A DRY
OW-6A 562.35
OW-20A 560.57
OBA-14A 557.28
OBA-4A 558.87
OBA-26A 562.85
OBA-24A 563.27
OBA-25A 563.37
OBA-2A 561.32
PN-10A 561.35
PN-20A 559.57
PN-9A 559.89
RW-2-PZ 559.03
OBA-23A 561.91
PR-2 561.17
PN-2A 561.41
PR-3 557.65
OBA-16A 562.25
RW-3-PZ 556.98
RW-1-PZ 560.93
PN-19A 563.32
PN-3A 561.64
PN-1A 562.89
PN-18A 561.7
PN-16A 562.43
PN-4A 560.38
PN-17A 564.14
PR-4-PZ 556.75
PR-1 562.86
PN-5A 561.17
PR-13 559.15
PR-6 559.35
PN-15A 562.84
RW-4-PZ 557.05
PR-7 559.85
PN-14A 564.35
PR-14 558.68
OBA-6A 564.19
PN-6A 560.63
PR-8 558.91
PN-13A 564.19
PR-5 558.47
PR-9 559.74
PN-12A 564.79
PN-7A 560.84
PR-10 559.80
RW-5-PZ 556.81
PN-21A 564.72
PR-11 562.83
PN-8A 563.41
OBA-5A 564.11
PR-12 558.37
PN-11A 562.68
OBA-9A 562.15
OBA-9AR 560.16
OBA-10A 562.62
Gill Creek - Stilling Well 562.08
Gill Creek

Notes:
1. The Gill Creek elevation is continuously monitored (1 hr intervals) using a data logging transducer installed in the Gill Creek Stilling well. The average daily elevation is used to extrapolate the levels along the creek and create a breakline in the contouring model.
2. Yellow Highlighted wells are dry or have water level elevations below the bottom of the A-Zone. Bottom of A-Zone elevation used in contouring for these wells.

Legend
- Olin Monitoring Well
- Olin Passive Relief Well
- Olin Recovery Well
- Olin Surface Water Monitoring Location
- Solvent Monitoring Well
- Potentiometric Surface Contour
- Gill Creek
- Approximate Olin Boundary
- Groundwater Flow Direction
- Interpreted A Zone Dewatered Area (WL < 0.5 feet)

Recovery Well	Average Flow Rate (gpm)
RW-1	1.2
RW-2	1.5
RW-3	0.1
RW-4	0.8
RW-5	2.7
PR-4	0.9
PR-12	2
OBA-9AR	0.666

0 50 100 Feet

0 200 400 Feet

2015 Annual OMM Report

Olin Chemicals Plant Niagara Falls, NY

A Zone Potentiometric Contours December 17, 2015

Prepared By-Date: JRM - 03/03/2016
Checked By-Date: AWE - 03/03/2016
Project Number: 6107160002

amec foster wheeler

Figure: 4.4

Path: G:\olin niagra\2015 OMM Report\mxds\Zone A Dec 2015.mxd

Buffalo Avenue

Buffalo Avenue

OBA-11B 557.22

OBA-1B 555.39

OBA-8B 558.63

PN-24B 557.37

OW-15B 557.51

OW-31B 557.25

OW-32B 557.44

OW-22B 557.18

OBA-14B 557.07

OW-25B 557.11

OW-33B 557.23

PW-3B 553.01

OW-24B 557.31

PW-4B 556.43

OW-4B 557.50

OW-23B 557.01

OBA-4B 558.62

OBA-26B 557.85

OBA-25B 557.78

OBA-2B 557.18

PN-20B 557.06

PN-10B 558.16

PN-9B 557.25

RW-2-PZ 556.92

OBA-23B 558.30

PN-2B 557.19

OBA-16B 557.68

RW-3-PZ 556.98

RW-1-PZ 558.14

PN-19B 559.73

PN-18B 558.77

PN-1B 558.41

PN-4B 557.22

PN-17B 558.49

PR-4-PZ 556.15

PN-5B 557.14

PN-15B 557.65

RW-4-PZ 556.86

PN-6B 557.14

PN-13B 557.83

PN-12B 557.85

RW-5-PZ 557.04

PN-21B 559.21

PN-8B 557.04

PR-12 557.01

OBA-5B 560.18

PN-11B 557.60

Gill Creek

0 50 100 Feet

0 200 400 Feet

Legend

- Olin Monitoring Well
- Olin Recovery Well
- Solvent Monitoring Well
- Solvent Recovery Well
- Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Recovery Well	Average Flow Rate (gpm)
RW-1	0.9
RW-2	5.6
RW-3	0.6
RW-4	0.6
RW-5	4.7
PR-4	1.7
PR-12	4.5
OBA-9AR	0.6

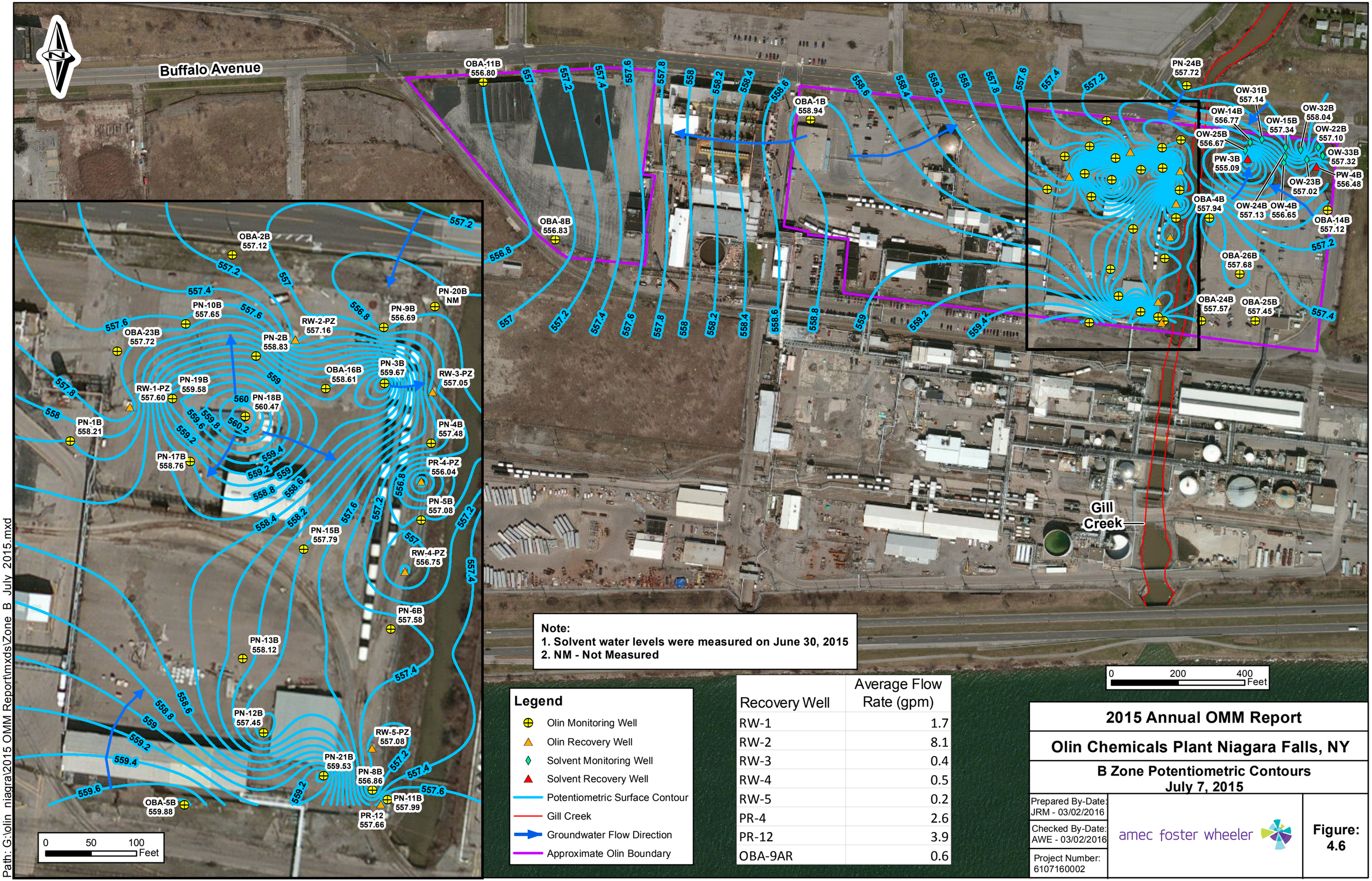
2015 Annual OMM Report

Olin Chemicals Plant Niagara Falls, NY

B Zone Potentiometric Contours April 8, 2015

Prepared By-Date: JRM - 03/03/2016	amec foster wheeler
Checked By-Date: AWE - 03/03/2016	Figure: 4.5
Project Number: 6107160002	

Path: G:\olin_niagra\2015 OMM Report\mxds\Zone_B_April_2015.mxd



Note:
1. Solvent water levels were measured on June 30, 2015
2. NM - Not Measured

Legend

- Olin Monitoring Well
- Olin Recovery Well
- Solvent Monitoring Well
- Solvent Recovery Well
- Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Recovery Well	Average Flow Rate (gpm)
RW-1	1.7
RW-2	8.1
RW-3	0.4
RW-4	0.5
RW-5	0.2
PR-4	2.6
PR-12	3.9
OBA-9AR	0.6

2015 Annual OMM Report

Olin Chemicals Plant Niagara Falls, NY

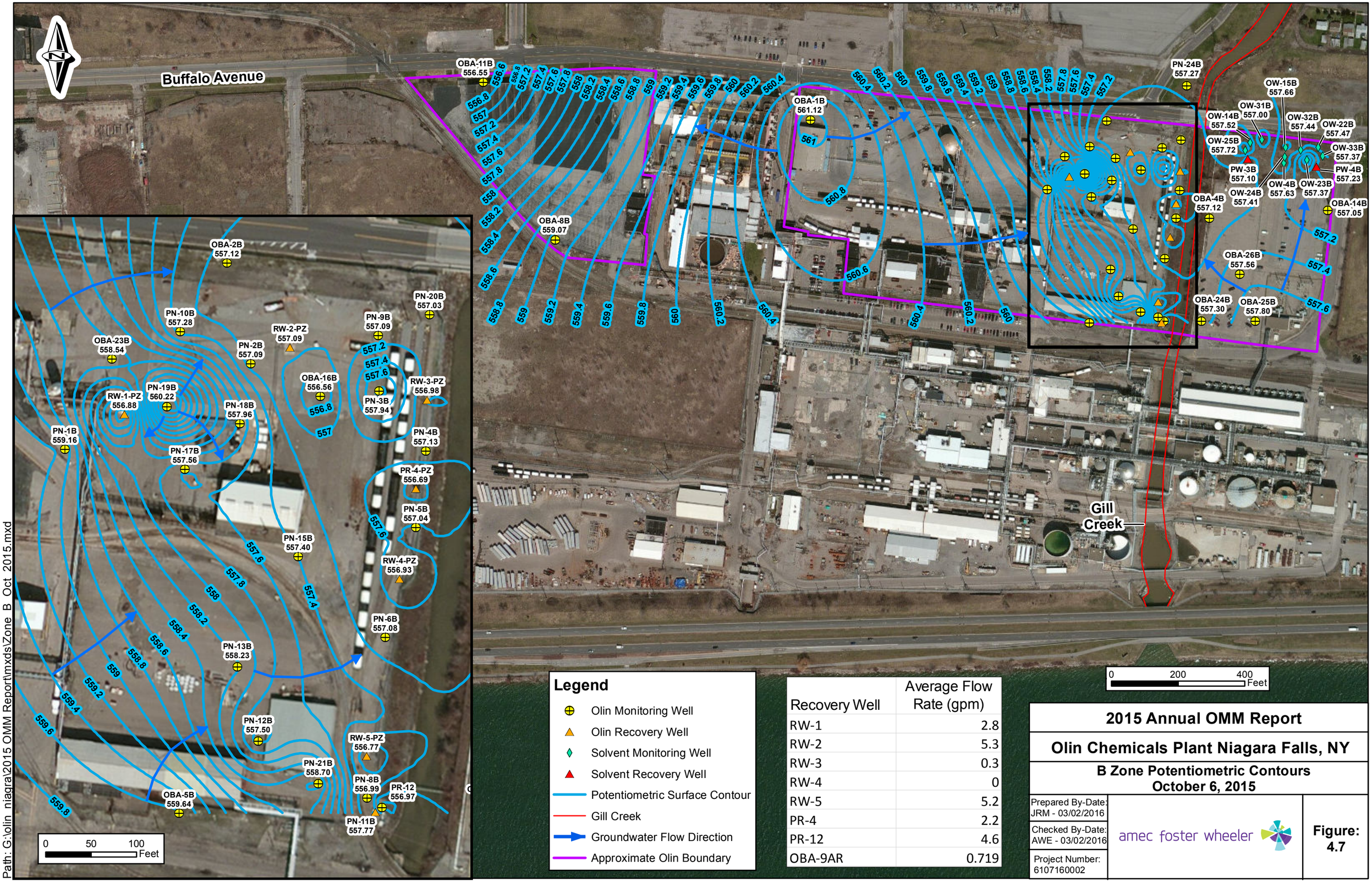
B Zone Potentiometric Contours July 7, 2015

Prepared By-Date: JRM - 03/02/2016
Checked By-Date: AWE - 03/02/2016
Project Number: 6107160002

amec foster wheeler

Figure: 4.6

Path: G:\olin_niagara\2015 OMM Report\mxds\Zone_B_July_2015.mxd



Legend

- Olin Monitoring Well
- Olin Recovery Well
- Solvent Monitoring Well
- Solvent Recovery Well
- Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Recovery Well	Average Flow Rate (gpm)
RW-1	2.8
RW-2	5.3
RW-3	0.3
RW-4	0
RW-5	5.2
PR-4	2.2
PR-12	4.6
OBA-9AR	0.719

2015 Annual OMM Report

Olin Chemicals Plant Niagara Falls, NY

B Zone Potentiometric Contours October 6, 2015

Prepared By-Date: JRM - 03/02/2016	amec foster wheeler	Figure: 4.7
Checked By-Date: AWE - 03/02/2016		
Project Number: 6107160002		

Path: G:\olin_niagra\2015 OMM Report\mxds\Zone_B_Oct_2015.mxd

Buffalo Avenue

OBA-11B 555.36
OBA-1B 554.98
OBA-8B 557.61
OBA-2B 556.85
PN-10B 557.40
PN-20B 556.94
PN-9B 556.98
RW-2-PZ 557.06
PN-2B 556.97
OBA-23B 558.07
PN-19B 561.28
OBA-16B 557.29
PN-3B 557.85
RW-3-PZ 556.98
PN-18B 558.08
PN-1B 557.51
RW-1-PZ 558.06
PN-17B 557.69
PN-4B 557.04
PR-4-PZ 556.75
PN-5B 556.96
PN-15B 557.40
RW-4-PZ 557.05
PN-6B 557.01
PN-13B 557.49
PN-12B 557.55
RW-5-PZ 556.73
PN-21B 558.52
PN-8B 557.01
PN-11B 557.40
OBA-5B 559.22
PR-12 557.00
PN-24B 557.59
OW-32B 557.23
OW-31B 557.44
OW-15B 557.28
OW-22B 557.04
OW-14B 556.56
OW-33B 557.04
OW-25B 557.23
PW-4B 555.71
PW-3B 553.41
OW-4B 557.25
OBA-4B 557.33
OW-24B 557.07
OW-23B 556.96
OBA-14B 556.84
OBA-26B 557.34
OBA-24B 557.84
OBA-25B 557.24

Gill Creek

0 50 100 Feet

0 200 400 Feet

Legend

- Olin Monitoring Well
- Olin Recovery Well
- Solvent Monitoring Well
- Solvent Recovery Well
- Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Recovery Well	Average Flow Rate (gpm)
RW-1	1.2
RW-2	1.5
RW-3	0.1
RW-4	0.8
RW-5	2.7
PR-4	0.9
PR-12	2
OBA-9AR	0.666

2015 Annual OMM Report

Olin Chemicals Plant Niagara Falls, NY

B Zone Potentiometric Contours December 17, 2015

Prepared By-Date: JRM - 03/02/2016

Checked By-Date: AWE - 03/02/2016

Project Number: 6107160002

amec foster wheeler

Figure: 4.8

Path: G:\olin_niagra\2015 OMM Report\mxds\Zone_B_Dec_2015.mxd

Buffalo Avenue

OBA-1C
561.28

OPW-1
554.90

OBA-7C
554.25

OBA-15B
557.08

OBA-4C
557.02

OBA-14C
554.75

Gill Creek

0 150 300 Feet

Legend

- Olin Monitoring Well
- Olin Production Well
- Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Well	Average Flow Rate (gpm)
Olin Production Well	502

Pumping Well to Water Elevation Conversion:
Water Elevation = -0.00613915
GPM +557.951 (Source: 1994 RFI)

2015 Annual OMM Report

Olin Chemicals Plant Niagara Falls, NY

C Zone Potentiometric Contours
April 8, 2015

Prepared By-Date: JRM - 03/02/2016
Checked By-Date: AWE - 03/02/2016
Project Number: 6107160002

amec foster wheeler

Figure: 4.9

Path: G:\olin_niagra\2015 OMM Report\mxds\Zone_C_April_2015.mxd

Buffalo Avenue

OBA-1C
555.34

OBA-7C
553.14

OPW-1
553.90

OBA-15B
556.64

OBA-4C
557.04

OBA-14C
554.26

Gill Creek

554.4 554.6 554.8 555 555.2 554.8 555 555.2 555.4 555.6 555.8 556 556.2 556.4 556.2 555.8 555.4 555 554.6 554.2 554 553.8 553.6 553.4 553.2 553.4 553.6 553.8 554 554.2 554.4 554.6 554.8 555 555.2 555.4 555.6 555.8 556.6 556.8 557 556.8 556.6 556.4 556 555.6 555.2 554.8

0 150 300 Feet

Legend

- Olin Monitoring Well
- Olin Production Well
- Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Well	Average Flow Rate (gpm)
Olin Production Well	658

Pumping Well to Water Elevation Conversion:
Water Elevation = -0.00613915
GPM +557.951 (Source: 1994 RFI)

2015 Annual OMM Report

Olin Chemicals Plant Niagara Falls, NY

C Zone Potentiometric Contours
July 7, 2015

Prepared By-Date: JRM - 03/03/2016	amec foster wheeler
Checked By-Date: AWE - 03/03/2016	Figure: 4.10
Project Number: 6107160002	

Path: G:\olin_niagra\2015 OMM Report\mxds\Zone_C_July_2015.mxd

Buffalo Avenue

OBA-1C
555.57

OBA-7C
554.85

OPW-1
554.50

OBA-15B
557.16

OBA-4C
557.04

OBA-14C
556.04

554.8
555
555.2
555.4
555.6
555.8
556
556.2
556.4
556.6
556.8
9.999
554.6
557
556.8
556.6
556.4
556.2

Gill Creek

0 150 300 Feet

Legend

- Olin Monitoring Well
- Olin Production Well
- Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Well	Average Flow Rate (gpm)
Oil Production Well	559

Pumping Well to Water Elevation Conversion:
Water Elevation = -0.00613915
GPM +557.951 (Source: 1994 RFI)

2015 Annual OMM Report

Olin Chemicals Plant Niagara Falls, NY

C Zone Potentiometric Contours
October 6, 2015

Prepared By-Date: JRM - 03/03/2016	amec foster wheeler	Figure: 4.11
Checked By-Date: AWE - 03/03/2016		
Project Number: 6107160002		

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Buffalo Avenue

OBA-1C
554.34

OPW-1
553.70

OBA-7C
554.15

OBA-15B
556.93

OBA-4C
556.94

OBA-14C
553.36

Gill Creek

554 554.2 554.4 554.6 554.8 555 555.2 555.4 555.6 555.8 556 556.2 556.4 556.6 553.8 554 554.2 554.4 554.6 554.8 555 555.2 555.4 555.6 555.8 556 556.2 556.4 556.6 556.4 556 555.4 555 554.8 554.6 554.4 554.2 554 553.8 556.8 556.4 556 555.4 554.8 554.4 554.2 553.8 553.6

0 150 300 Feet

Legend

- Olin Monitoring Well
- Olin Production Well
- Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Well	Average Flow Rate (gpm)
Olin Production Well	693

Pumping Well to Water Elevation Conversion:
Water Elevation = -0.00613915
GPM +557.951 (Source: 1994 RFI)

2015 Annual OMM Report

Olin Chemicals Plant Niagara Falls, NY

C Zone Potentiometric Contours December 17, 2015

Prepared By-Date: JRM - 03/03/2016	
Checked By-Date: AWE - 03/03/2016	amec foster wheeler
Project Number: 6107160002	Figure: 4.12

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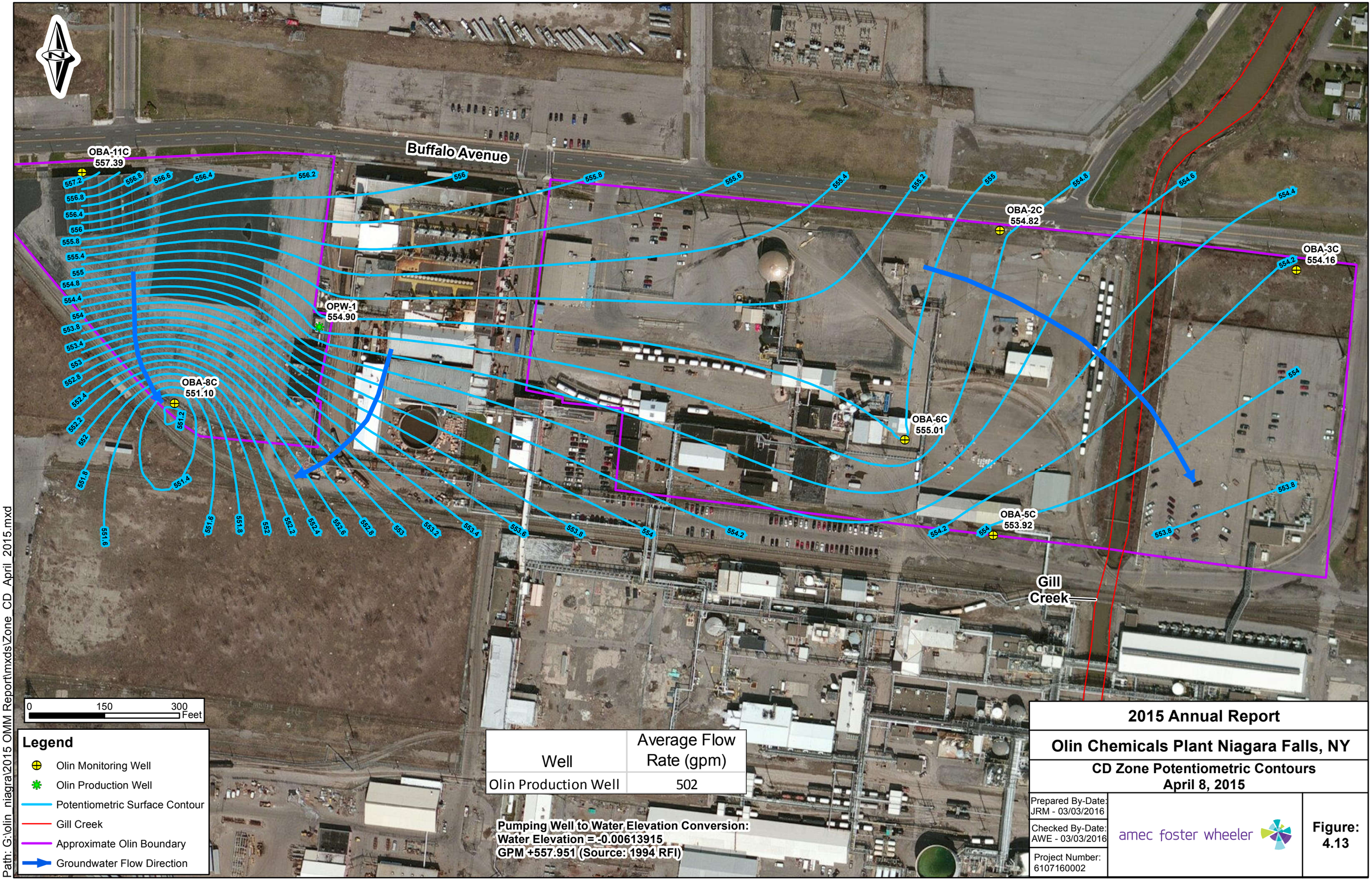

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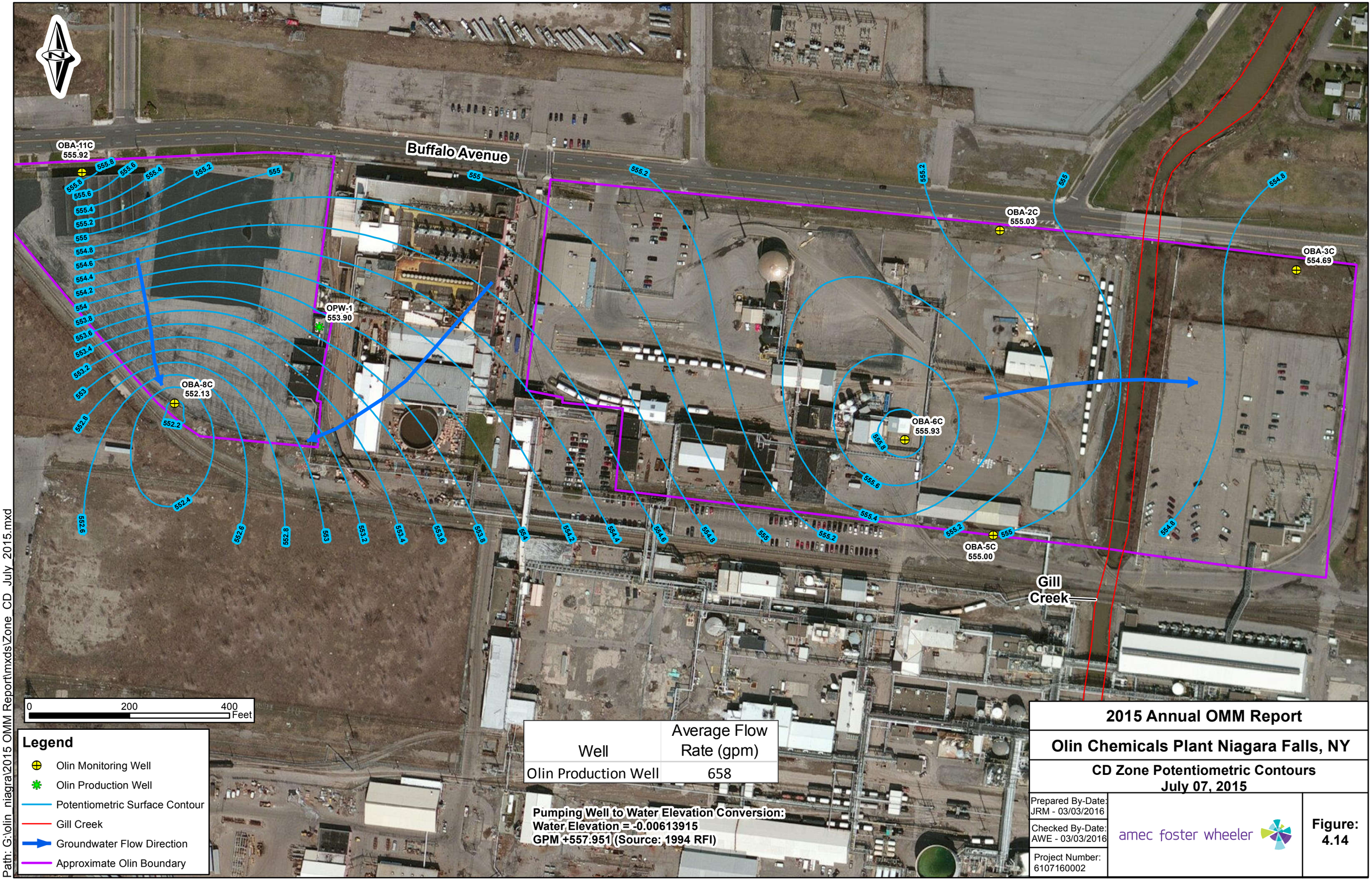
2015 Annual Report

Olin Chemicals Plant Niagara Falls, NY

CD Zone Potentiometric Contours
April 8, 2015

Prepared By-Date: JRM - 03/03/2016	amec foster wheeler	Figure: 4.13
Checked By-Date: AWE - 03/03/2016		
Project Number: 6107160002		



Legend

- Olin Monitoring Well
- Olin Production Well
- Potentiometric Surface Contour
- Gill Creek
- Groundwater Flow Direction
- Approximate Olin Boundary

Well	Average Flow Rate (gpm)
Olin Production Well	658

Pumping Well to Water Elevation Conversion:
Water Elevation = -0.00613915
GPM +557.951 (Source: 1994 RFI)

2015 Annual OMM Report

Olin Chemicals Plant Niagara Falls, NY

CD Zone Potentiometric Contours
July 07, 2015

Prepared By-Date: JRM - 03/03/2016	Figure: 4.14
Checked By-Date: AWE - 03/03/2016	
Project Number: 6107160002	

amec foster wheeler

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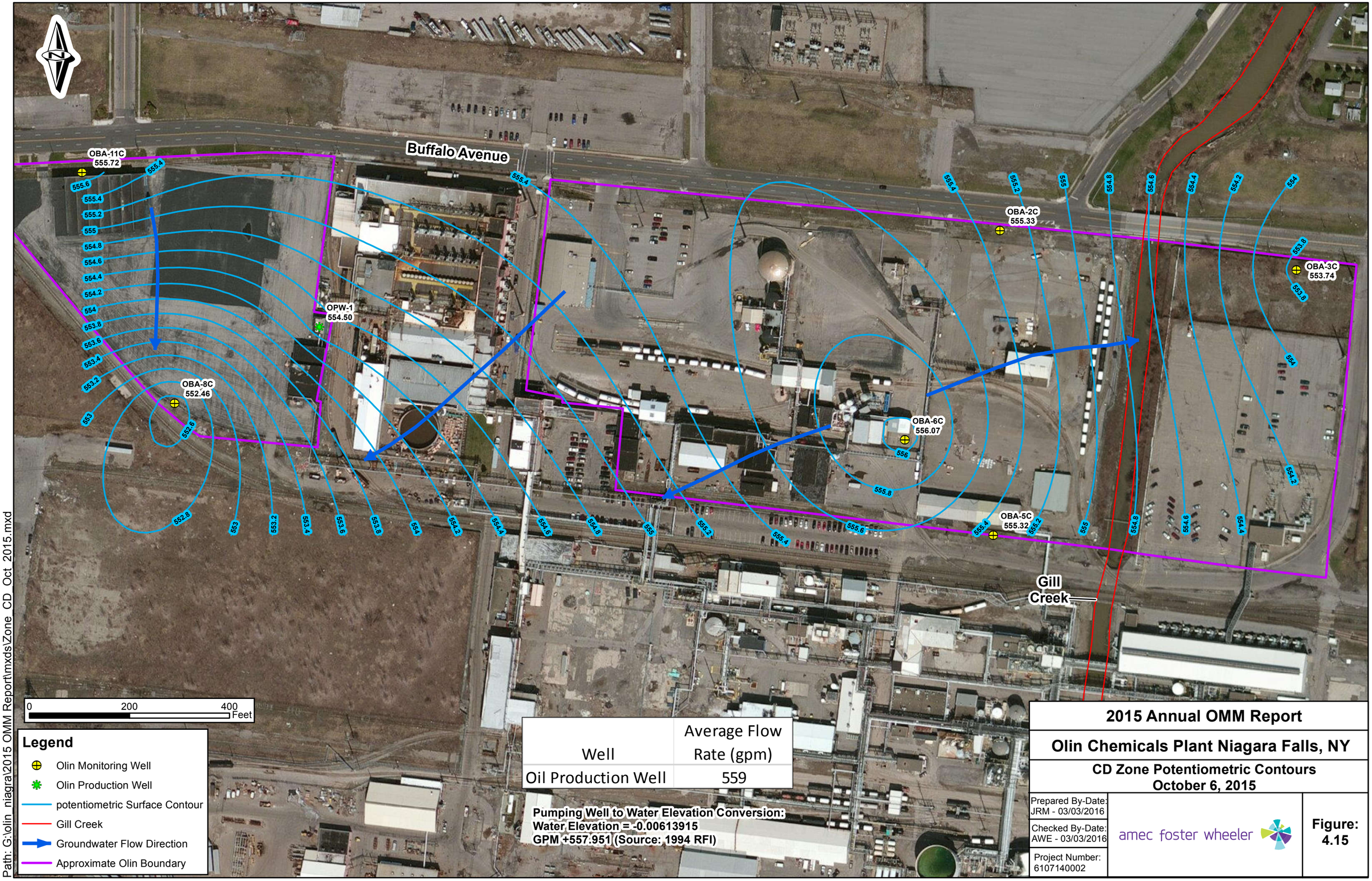
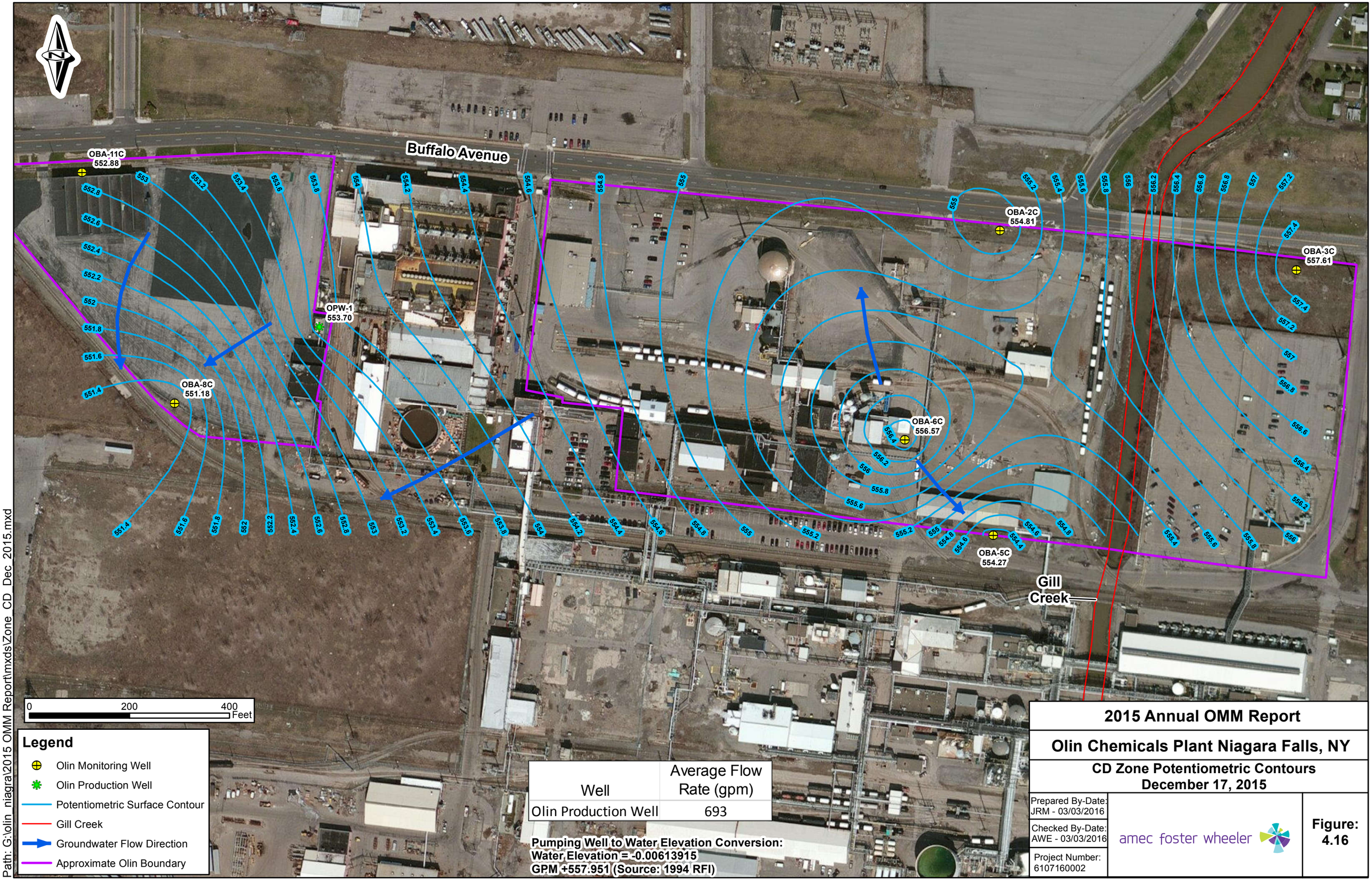

Buffalo Avenue
Gill Creek
OBA-11C
555.72
OBA-2C
555.33
OBA-3C
553.74
OBA-5C
555.32
OBA-6C
556.07
OBA-8C
552.46
OPW-1
554.50
555.6
555.4
555.2
555
554.8
554.6
554.4
554.2
554
553.8
553.6
553.4
553.2
553
552.8
552.6
555.8
556
554.9
0
200
400
Feet
Legend
Olin Monitoring Well
Olin Production Well
potentiometric Surface Contour
Gill Creek
Groundwater Flow Direction
Approximate Olin Boundary
Well
Average Flow Rate (gpm)
Oil Production Well
559
Pumping Well to Water Elevation Conversion:
Water Elevation = -0.00613915
GPM +557.951 (Source: 1994 RFI)
2015 Annual OMM Report
Olin Chemicals Plant Niagara Falls, NY
CD Zone Potentiometric Contours
October 6, 2015
Prepared By-Date:
JRM - 03/03/2016
Checked By-Date:
AWE - 03/03/2016
Project Number:
6107140002
amec foster wheeler
Figure:
4.15
Path: G:\olin_niagra\2015 OMM Report\mxds\Zone_CD_Oct_2015.mxd



Path: G:\olin_niagra\2015 OMM Report\mxds\Zone_CD_Dec_2015.mxd

2015 Annual OMM Report

Olin Chemicals Plant Niagara Falls, NY

CD Zone Potentiometric Contours December 17, 2015

Prepared By-Date: JRM - 03/03/2016	amec foster wheeler	Figure: 4.16
Checked By-Date: AWE - 03/03/2016		
Project Number: 6107160002		

Buffalo Avenue

OBA-1A 1 U
OBA-8A 1 U
OBA-23A 1 U
OBA-6A 11
OBA-5A 6100
PN-20A 1 U
OBA-15A 2 U
OBA-3A 3.1
OBA-16A 1 U
PN-3A 1 U
PN-18A 1 U
PN-4A 1 U
PN-17A 1 U
PN-5A 1 U
OBA-4A 1 U
OBA-14A 1 U
PN-15A 8.2
PN-14A 190
PN-6A 9.8
OBA-26A 1 U
PN-7A 1 U
PN-12A 3.7
PN-11A 1 U
OBA-24A 1 U
OBA-25A 1 U
OBA-10A 1800

Legend

1,2,4-Trichlorobenzene (µg/L)

- 0.5 - 5
- 5 - 50
- 50 - 500
- 500 - 5000
- 5000 - 50000
- Gill Creek
- Approximate Olin Boundary

Notes:
U - Not Detected
J - Estimated

0 200 400 Feet

Path: G:\olin_niagra\mxds\2015 Annual Report\A_Zone_trichlorobenzene.mxd

2015 Annual Report

Olin Chemicals Plant Niagara Falls, NY

1,2,4-Trichlorobenzene Concentrations - A-Zone June 2015

Prepared By-Date: JRM - 9/15/2015	amec foster wheeler
Checked By-Date: AWE - 9/15/2015	
Project Number: 6107150002	

Figure: 5.1

Buffalo Avenue

OBA-11B 500
OBA-8B 6000
OBA-1B 1 U
OBA-2B 170
PN-20B 55 J
OBA-23B 1200
OBA-16B 1900
PN-17B 12000
PN-4B 1400
PN-5B 8000
OBA-14B 1 U
OBA-4B 1 U
PN-15B 17000
PN-14B 9400
OBA-6B 200
PN-6B 9600
OBA-26B 3
PN-7B 3300
PN-12B 17000
PN-11B 7700
OBA-5B 10000
OBA-24B 840
OBA-25B 1 U

Legend

1,2,4-Trichlorobenzene (µg/L)

- 0.5 - 5
- 5 - 50
- 50 - 500
- 500 - 5000
- 5000 - 50000
- Gill Creek
- Approximate Olin Boundary

Notes:
U - Not Detected
J - Estimated

0 200 400 Feet

Path: G:\olin_niagra\mxds\2015 Annual Report\B_Zone_trichlorobenzene.mxd

2015 Annual Report

Olin Chemicals Plant Niagara Falls, NY

1,2,4-Trichlorobenzene Concentrations - B-Zone June 2015

Prepared By-Date: JRM - 9/16/2015	amec foster wheeler
Checked By-Date: AWE - 9/16/2015	Figure: 5.2
Project Number: 6107150002	

Buffalo Avenue

OBA-1A
1 U

OBA-8A
1.4

OBA-23A
10

OBA-6A
1.7

PN-20A
16

OBA-15A
2 U

OBA-3A
67

OBA-16A
3.7

PN-3A
2.6

PN-18A
14

PN-4A
1.6

PN-17A
1 U

PN-5A
1 U

OBA-14A
1 U

OBA-4A
12

PN-15A
2.5 U

PN-14A
11

PN-6A
3.2

OBA-26A
1 U

PN-7A
17

PN-12A
3.7

OBA-5A
310

PN-11A
4.7

OBA-24A
20

OBA-25A
20

OBA-10A
20 U

N

Legend

Trichloroethene (µg/L)

- 0.5 - 5
- 5 - 50
- 50 - 500
- Gill Creek
- Approximate Olin Boundary

Notes:
U - Not Detected
J - Estimated

0 200 400 Feet

Path: G:\olin_niagra\mxds\2015 Annual Report\A_Zone_trichloroethene.mxd

2015 Annual Report

Olin Chemicals Plant Niagara Falls, NY

Trichloroethene Concentrations - A-Zone June 2015

Prepared By-Date: JRM - 9/15/2015	amec foster wheeler	Figure: 5.3
Checked By-Date: AWE - 9/15/2015		
Project Number: 6107150002		

Buffalo Avenue

OBA-11B 150
OBA-1B 120
OBA-2B 28
PN-20B 1600
OBA-23B 4.6
OBA-16B 1600
PN-4B 52
PN-17B 100 U
PN-5B 8300
OBA-14B 1 U
OBA-4B 1.9
PN-15B 160
OBA-8B 50 U
PN-14B 50 U
PN-6B 850
OBA-6B 27
OBA-26B 1 U
PN-7B 550
PN-12B 4500
PN-11B 160000
OBA-5B 20000
OBA-24B 7500
OBA-25B 1 U

Legend

Trichloroethene (µg/L)

- 0.5 - 5
- 5 - 50
- 50 - 500
- 500 - 5000
- 5000 - 50000
- > 50000
- Gill Creek
- Approximate Olin Boundary

Notes:
U - Not Detected
J - Estimated

0 200 400 Feet

Path: G:\olin_niagra\mxds\2015 Annual Report\B_Zone_trichloroethene.mxd

2015 Annual Report

Olin Chemicals Plant Niagara Falls, NY

Trichloroethene Concentrations - B-Zone June 2015

Prepared By-Date: JRM - 9/16/2015	amec foster wheeler	**Figure: 5.4**
Checked By-Date: AWE - 9/16/2015		
Project Number: 6107150002		

Buffalo Avenue

OBA-1A 0.47 U
OBA-8A 0.047 U
OBA-6A 0.047 U
OBA-5A 110
OBA-23A 0.047 U
OBA-16A 0.47 U
PN-20A 0.047 U
OBA-15A 0.047 U
OBA-3A 0.27
PN-3A 0.47 U
PN-18A 2.4 U
PN-4A 0.047 U
PN-17A 0.047 U
PN-5A 0.094 U
OBA-4A 0.047 U
OBA-14A 0.047 U
PN-15A 0.047 U
PN-14A 0.24 U
PN-6A 0.047 U
OBA-26A 0.047 U
PN-7A 0.94 U
PN-12A 0.047 U
PN-11A 0.4
OBA-24A 0.047 U
OBA-25A 0.047 U
OBA-10A 55

Legend

Gamma BHC (µg/L)

- 0.005 - 0.05
- 0.05 - 0.5
- 0.5 - 5
- 5 - 50
- 50 - 500
- Gill Creek
- Approximate Olin Boundary

Notes:
U - Not Detected
J - Estimated

0 200 400 Feet

Path: G:\olin_niagra\mxds\2015 Annual Report\A_Zone_Gamma.mxd

2015 Annual Report

Olin Chemicals Plant Niagara Falls, NY

Gamma-BHC Concentrations - A-Zone June 2015

Prepared By-Date: JRM - 9/16/2015	amec foster wheeler
Checked By-Date: AWE - 9/16/2015	**Figure: 5.5**
Project Number: 6107150002	

Buffalo Avenue

OBA-11B
0.24 U

OBA-1B
0.054

OBA-2B
0.047 U

PN-20B
0.23

OBA-23B
0.094 U

OBA-16B
3

PN-4B
140

PN-17B
0.47 U

PN-5B
1300

OBA-14B
0.047 U

OBA-4B
0.047 U

PN-15B
4.7 U

OBA-8B
0.094 U

PN-14B
4.7 U

PN-6B
340

OBA-6B
0.047 U

OBA-26B
0.047 U

PN-7B
210

PN-12B
55

OBA-5B
460

PN-11B
370

OBA-24B
78

OBA-25B
0.047 U

Legend

Gamma BHC (µg/L)

- 0.005 - 0.05
- 0.05 - 0.5
- 0.5 - 5
- 5 - 50
- 50 - 500
- Gill Creek
- Approximate Olin Boundary

Notes:
U - Not Detected
J - Estimated

0 200 400 Feet

2015 Annual Report

Olin Chemicals Plant Niagara Falls, NY

Gamma-BHC Concentrations - B-Zone
June 2015

Prepared By-Date: JRM - 2/3/2015	amec foster wheeler	**Figure: 5.6**
Checked By-Date: AWE - 2/3/2015		
Project Number: 6107150002		

Path: G:\olin_niagra\mxds\2015 Annual Report\B_Zone_Gamma.mxd

Buffalo Avenue

OBA-1A 0.2 U
OBA-8A 0.2 U
OBA-23A 1.67
PN-20A 0.26
OBA-15A 0.2 U
OBA-3A 0.2 U
OBA-16A 5.13
PN-3A 8.32
PN-18A 1340
PN-4A 0.2 U
PN-17A 40.2
PN-5A 0.2 U
OBA-4A 0.2 U
OBA-14A 0.2 U
PN-15A 0.2 U
PN-14A 1.15
PN-6A 7.32
OBA-6A 0.2 U
OBA-26A 0.2 U
PN-7A 0.27
PN-12A 0.2 U
OBA-5A 0.37
PN-11A 0.96
OBA-24A 0.2 U
OBA-25A 5.01
OBA-10A 0.2 U

Legend

Total Mercury (µg/L)

- 0.2 - 2
- 2 - 20
- 20 - 200
- 200 - 2000
- Gill Creek
- Approximate Olin Boundary

Notes:
U - Not Detected
J - Estimated

0 200 400 Feet

Path: G:\olin_niagra\mxds\2015 Annual Report\A_Zone_Mercury.mxd

2015 Annual Report

Olin Chemicals Plant Niagara Falls, NY

Total Mercury Concentrations - A-Zone June 2015

Prepared By-Date: JRM - 9/16/2015	amec foster wheeler	**Figure: 5.7**
Checked By-Date: AWE - 9/16/2015		
Project Number: 6107150002		

Buffalo Avenue

OBA-11B
0.2 U

OBA-1B
85

OBA-2B
0.2 U

PN-20B
0.2 U

OBA-23B
0.2 U

OBA-16B
7.27

PN-17B
8.99

PN-4B
1.63

PN-5B
1.62

OBA-4B
0.2 U

OBA-14B
0.2 U

PN-15B
4.33

OBA-8B
0.2 U

PN-14B
1.86

OBA-6B
1.92

PN-6B
1.53

OBA-26B
0.2 U

PN-7B
0.51

PN-12B
1.88

PN-11B
0.62

OBA-24B
0.2 U

OBA-25B
0.2 U

OBA-5B
0.2 U

Legend

Total Mercury (µg/L)

- 0.2 - 2
- 2 - 20
- 20 - 200
- Gill Creek
- Approximate Olin Boundary

Notes:
U - Not Detected
J - Estimated

0 200 400 Feet

Path: G:\olin_niagra\mxds\2015 Annual Report\B_Zone_Mercury.mxd

2015 Annual Report

Olin Chemicals Plant Niagara Falls, NY

Total Mercury Concentrations - B-Zone
June 2015

Prepared By-Date: JRM - 9/16/2015	amec foster wheeler	**Figure: 5.8**
Checked By-Date: AWE - 9/16/2015		
Project Number: 6107150002		

APPENDIX A

NYSDEC CORRESPONDENCE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Remedial Bureau E
625 Broadway, 12th Floor, Albany, NY 12233-7017
P: (518) 402-9813 I F: (518) 402-9819
www.dec.ny.gov

June 18, 2015

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

RE: 2014 Annual Operations, Maintenance, and Monitoring Report
Olin Chemicals, Buffalo Avenue Facility, Niagara Falls, New York
AOC Index No. R9-4171-94-08, NYSDEC Site No. 932051A and B

Dear Mr. McClure:

The New York State Department of Environmental Conservation has reviewed the above-referenced report dated March 19, 2015. The report documents Olin's monitoring, remediation, and O&M activities at the Niagara Falls plant for the period January 1 to December 31, 2014.

Data in the report indicate that the remedial goals are being met for the ARGC area of Plant 2. For the reporting period, Olin's groundwater treatment system removed approximately 5,216 pounds of VOCs, 21 pounds of pesticides, and 0.3 pounds of mercury. The report documents that Olin has been responsive to repair and maintenance issues as they arise, and has made modifications and upgrades to improve the reliability of the system.

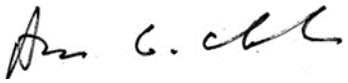
In the western portion of the site (historically known as Plant 1, which has generally been outside the area of groundwater remediation at the Olin facility), analytical data has shown that monitoring well OBA-8B has had elevated concentrations of 1,2,4-trichlorobenzene – between 2,000 and 11,000 µg/L – for a number of years. In contrast, during quarterly sampling associated with the RCRA Facility Investigation (RFI) in the early 1990s, 1,2,4-trichlorobenzene was not detected in well OBA-8B, with the exception of one sample in 1992 with 570 µg/L. Other Olin-derived constituents were likewise low or non-detect in B-zone groundwater in Plant 1 during the RFI. This suggests that the observed contamination migrated to this area after the RFI.

In this area of the site, 1,2,4-trichlorobenzene is assumed to be associated with the Olin facility. The adjacent DuPont facility did not use or produce chlorobenzenes and the former Solvent Chemical facility, which did, is likely too far east to account for the observed concentrations.

Potentiometric surface maps indicate that this contamination may be migrating westward to off-site areas, though monitoring data are limited. Therefore, Olin should evaluate the source and fate of the contamination in OBA-8B and determine if additional measures are needed to prevent its off-site migration. Please advise the Department once an action plan is developed for such an evaluation.

The above-referenced report is approved. If you have any questions regarding this letter, please call me at (518) 402-9813.

Sincerely,



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

ec: G. Sutton, NYSDEC, Region 9
A. Everett, USEPA, Region 2
M. Cruden, DER
D. Radtke, DER

APPENDIX B

WEEKLY O&M REPORTS

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 04	CONTRACT NO. **1113 Div 4**	DATE: 1/29/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 13**	**Max: 35**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Other notes and observations:

Sevenson started the RW-5 well piping repair on Monday, started digging, got down to the level of the pipe.
Tues. - Digging continued to create a "work area' with the vac truck and excavator, the safety shield was set in place.
Wed.- The damaged piping was cut away from the well (removed pitless adapter) and new force main piping and secondary containment piping was fused into place, clean stone was delivered for the pipe bedding backfill.
Thurs. - backfilling of the hole continued, done in lifts with compaction between them.
Friday. - Finished backfilling and compacting the excavation with the exception of a small area where the underground electrical conduit has to be installed. Reinstalled the level sensor and wiring to the hot box. Reconnected the transducer and display on the piezometer, had Gaines Electric come out to look at the conduit runs to re-establish power to the pump and hotbox.
Demobilized the equipment and the safety shield.

Other non RW-5 related work includes:
Removing the piping between PR-12 and OBA-9AR, and thawing it out as it had frozen at some time during the week. The heat trace around the pipe stopped working. We pulled everything apart, thawed it all out and reinstalled the pipe with new heat trace, and installed new insulation around the above ground secondary containment piping that carries it.
Chris also acid washed the trays in the air stripper this week. After the acid bath, The air flow in the stripper from the 680's up to 850 CFM.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.1	14.50	15.42	557.18	1.80
RW-2		14.91	15.11		5.19
RW-3	557.2	12.55	12.58	557.12	1.07
PR-4	555.6	13.43	13.70	555.72	1.9
RW-4	557.2	12.41	12.43	557.36	0.77
RW-5					
PR-12	557.4	---	12.35	557.25	5.59
OBA-9AR	557.0	12.99	13.23	556.97	1.9

CARBON VESSEL PRESSURE READINGS			
	SP#1	SP#2	dP
GAC #1	20	15	5
	SP#3	SP#4	
GAC #2	15	9	6
TOTAL GAC SYSTEM	9.4	**Diff,Pr**	
FLOW RATE	41	**GPM**	
OBA-9AR TOTALIZER	1231123		

PH Readings:				Acid level: 20%
RW-1	7.12			
PR-4	7.68			
PH Adj. Tanks	6.99	7.32	7.42	
Air Stripper level Sensor Cleaned?		yes		

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 05	CONTRACT NO. **1113 Div 4**		DATE: 2/03/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 5**	**Max: 18**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Other notes and observations:
RW-2's Transducer readout was blank Rob Meyer has been notified and E&I has been contacted, for now, we will run the pump in manual mode.

RW-1 was down. Chris pulled, cleaned and inspected the pump. The shaft was spinning but not pumping water. Inspected the piping for freeze up. Heated with a heat gun. Replaced the pump, Olin electrician installed new leads. The pump is now operational.

Calibrations on the transducers have been completed, except for RW-2 , which needs replacement.

Gaines electric was on site Friday to re-establish the wiring for RW-5. We ran into a problem with the buried conduit from the pole to the hot box at well RW-5. We will have to excavate and remove the existing conduits and replace them to pull new wires to the hot box. This will start Monday am. Gaines will be onsite Tuesday am to continue and complete the wiring. Anticipated time to restart RW-5 is Tuesday afternoon.

Item 042214.01: The pressure gauges on the GAC feed pumps need to be replaced. Rob has notified us that a work order has been issued for this.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.1	14.50	15.42	557.18	1.80
RW-2		14.90	15.08		5.03
RW-3	556.8	12.71	12.73	556.86	0.96
PR-4	555.6	13.48	13.73	556.16	1.8
RW-4	557.1	12.53	12.55	557.16	0.70

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	12	8
	SP#3	**SP#4**	
GAC #2	13	8	5
TOTAL GAC SYSTEM	13.4	**Diff,Pr**	

RW-5					
PR-12	557.2	---	12.48	557.12	5.39
OBA-9AR	557.0	13.45	13.75	556.37	2.0

FLOW RATE	44	**GPM**		
OBA-9AR TOTALIZER	1234503			

PH Readings:				Acid level: 50%
RW-1	7.99			
PR-4	7.56			
PH Adj. Tanks	7.78	7.56	7.40	
Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 06	CONTRACT NO. **1113 Div 4**	DATE: 2/12/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 16**	**Max: 26**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Other notes and observations:

Monday: Sevenson was onsite Monday to excavate around and expose the electrical conduit at RW-5 to allow the electricians to replace the conduit and repair the wiring to RW-5.

Tues: Sevenson started the GAC change out in Bldg. 73 by vacuuming out the spent carbon from the GAC vessels. Gaines Electric was onsite at RW-5 to replace the conduit and re-establish the wiring.

Wed: Sevenson completed the GAC change out in Bldg. 73 and demobilized the vac truck. Sevenson backfilled the trench at RW-5 covering the new electrical conduits. A final grading of the area will take place after the ground thaws and surrounding snow melts. A new flow valve was installed for the RW-1 pump at the manifold in B-73.

Thurs: Sevenson was onsite to try and troubleshoot electrical issues with the leak detection, and the level indicator at RW-5. Olin E&I has been asked investigate and troubleshoot the instrumentation. Chris also did the weekly well level monitoring.

Friday: Chris Jones was onsite to troubleshoot a low air flow condition at the air stripper, due to sub zero temperatures.

Item 042214.01: The pressure gauges on the GAC feed pumps Have been replaced, thank you.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.7	14.44	15.38	557.89	1.10
RW-2		14.93	15.10		5.12
RW-3	556.8	12.62	12.65	556.79	0.78
PR-4	555.6	13.20	13.44	556.36	1.9
RW-4	557.1	12.36	12.40	557.09	0.61
RW-5					
PR-12	557.2	---	12.35	557.25	5.15
OBA-9AR	556.1	13.22	13.40	556.70	2.0

CARBON VESSEL PRESSURE READINGS			
	SP#1	SP#2	dP
GAC #1	15	10	5
	SP#3	SP#4	
GAC #2	10	8	2
TOTAL GAC SYSTEM	4.2	**Diff,Pr**	
FLOW RATE	46	**GPM**	
OBA-9AR TOTALIZER	1240695		

PH Readings:				Acid level: 50%
RW-1	8.23			
PR-4	7.76			
PH Adj. Tanks	8.45	8.67	8.59	
Air Stripper level Sensor Cleaned?		yes		

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 07	CONTRACT NO. **1113 Div 4**	DATE: 2/18/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: -2**	**Max: 7**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Other notes and observations: Temperatures consistently below 0 at night and only into the single digits during the day have become a problem this week in B-73. Here is the rundown:

Monday: Over the weekend low temperatures caused a disruption in the system operation causing a freeze up in the entire GWTS building. The heaters in the building could not keep up with the cold weather and the system piping began to freeze. We also had freezing conditions in several of the ground water wells. Torpedo type kerosene heaters were brought in to thaw out the building and system components. Progress is slow but steady.
Olin E&I repaired the leak detection switch at RW-5 today.

Tues.: The system showed more signs of thawing out. The transducer for RW-5 was put back on line properly and is now functional.

Wed: Today we discovered still more frozen lines in the carbon feed system, more heaters were brought in for overnight thawing

Thurs: The system was back on line but repeatedly shut down on an alarm for low air flow. RW-5 will not start. Troubleshooting reveals that there is no 480V power coming from the MCC to the well site. Rob Meyer is notified of the issue. The rest of the system runs sporadically. Ice and snow are forming in the stripper trays; we have heaters around the stripper and piping. Water levels are taken on this day for the GW wells.

Friday: another cold snap last night brings temps down to -10 F. We are notified that the 7S sump has frozen also eliminating our ability to discharge water even if we thaw and get running. Heaters were introduced at 7S also, by afternoon it is thawed and functional. B-73 is still thawing. All heaters will run during the weekend as temps are projected to climb into the mid 20's Sat and Sun.
Monday looks promising to get the entire system back on line after favorable weather this weekend.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.5	14.42	15.35	557.87	2.03
RW-2		14.89	15.07		5.04
RW-3	556.8	12.60	12.65	556.81	0.68
PR-4	555.6	13.22	13.48	556.38	1.8
RW-4	557.1	12.35	12.40	557.11	0.72
RW-5					
PR-12	557.2	---	12.32	557.28	5.25
OBA-9AR	556.1	13.22	13.42	556.71	1.7

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	10	10
	SP#3	**SP#4**	
GAC #2	10	5	5
TOTAL GAC SYSTEM	10.3	**Diff,Pr**	
FLOW RATE	52	**GPM**	
OBA-9AR TOTALIZER	1242805		

PH Readings:				Acid level: 50%
RW-1	7.54			
PR-4	7.80			
PH Adj. Tanks	7.11	7.86	7.77	
Air Stripper level Sensor Cleaned?				yes

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 08	CONTRACT NO. **1113 Div 4**	DATE: 2/25/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 0**	**Max: 15**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Other notes and observations:

Monday: Rob Meyer noted that the system only tripped out 1 time over the weekend. About 7pm Sunday evening, restarted Monday am. Heaters were kept running over the weekend keeping the building at 38F, so not freezing problems inside. RW-1 needed adjustment on the pH levels but ran fine after that. OBA-9AR has frozen again, Chris Jones will be out Tuesday am to thaw. RW-5 still down with an electrical issue.
Tuesday: Chris Jones (SES) was onsite to thaw and restart OBA-9AR. Decant water from the spent GAC drums. Re-fuel the torpedo heaters in Blgd.-73. Walker was onsite to investigate the issue with RW-5. Determined that it was a lack of electricity coming from the MCC. Rob Meyer was asked to notify Olin E&I about a repair.
Wednesday: Chris Jones was onsite to measure GW levels in the wells and record data, and refuel the torpedo heaters again. Olin electricians looked into the RW-5 MCC and determined that there is a faulty electrical selector switch. A new one has been ordered.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.4	14.65	15.58	557.70	1.92
RW-2		14.87	15.05		7.12
RW-3	556.7	12.58	12.60	556.83	0.63
PR-4	555.6	13.20	13.42	556.40	1.9
RW-4	557.0	12.34	12.42	557.10	0.70
RW-5					
PR-12	557.3	---	12.38	557.30	5.11
OBA-9AR	556.1	13.25	13.40	556.69	2.1

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	15	10	5
	SP#3	**SP#4**	
GAC #2	10	7	3
TOTAL GAC SYSTEM	9.2	**Diff,Pr**	
FLOW RATE	48	**GPM**	
OBA-9AR TOTALIZER	1247234		

PH Readings:				Acid level: 20%

RW-1	8.65			
PR-4	7.82			
PH Adj. Tanks	8.02	8.30	8.62	
Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 09	CONTRACT NO. **1113 Div 4**	DATE: 3/03/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 15**	**Max: 26**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.
Other notes and observations:
Adjustments were made to the newly installed valve at the RW-1 manifold to curtail any leaks.
PR-12 was acid washed.
A general policing and cleanup of B-73 has begun in preparation for the upcoming audit.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.4	14.68	15.61	557.73	0.80
RW-2		14.91	15.11		5.02
RW-3	557.2	12.56	12.61	557.10	0.65
PR-4	555.6	13.42	13.68	555.71	1.9
RW-4	557.2	12.40	12.42	557.38	0.72
RW-5					
PR-12	557.4	---	12.35	557.26	4.89
OBA-9AR	557.1	13.00	13.25	556.99	2.0

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	15	15	0
	SP#3	**SP#4**	
GAC #2	15	7	8
TOTAL GAC SYSTEM	6.3	**Diff,Pr**	
FLOW RATE	44	**GPM**	
OBA-9AR TOTALIZER	1250198		

PH Readings:				Acid level: 70%
RW-1	6.91			
PR-4	7.73			
PH Adj. Tanks	7.03	7.21	7.14	
Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 10	CONTRACT NO. **1113 Div 4**		DATE: 3/10/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 26**	**Max: 42**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Other notes and observations:

Sevenson Acid washed PR-12.

The flow meter for the GAC feed system was not functioning, Chris took it apart and cleaned it. Now it is operational.

Chris spent some time searching for the flush mount wells that will have to be inspected and measured this month. He found that Wells: PR-8, PR-13, PR-6, PN-5A, PN-5B are under a mountain of snow that has been pushed up by a plow on the west side of Gill Creek. Wells PN-7A&B, and PR-10 are under a pile of gravel near RW-5. Rob Meyer has been notified and said that he would try to help out in this matter. The rest of the wells are under 1-2' of snow and should melt away (hopefully) in the next week or so.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.7	14.82	15.75	557.44	0.85
RW-2	556.8	14.85	15.10	556.67	7.10
RW-3	556.9	12.69	12.73	556.70	0.71
PR-4	556.3	13.23	13.44	555.91	1.9
RW-4	556.8	12.50	12.61	556.92	0.65
RW-5					
PR-12	557.2	---	12.42	557.30	5.11
OBA-9AR	557.1	13.03	13.29	557.02	2.1

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	30	14	16
	SP#3	**SP#4**	
GAC #2	14	10	4
TOTAL GAC SYSTEM	16.9	**Diff,Pr**	
FLOW RATE	41	**GPM**	
OBA-9AR TOTALIZER	1251008		

PH Readings:				Acid level: 50%
RW-1	6.80			
PR-4	7.79			
PH Adj. Tanks	6.99	7.12	7.10	

Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 11	CONTRACT NO. **1113 Div 4**		DATE: 3/17/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 31**	**Max: 40**

Work performed this week:

The Plant was on a shut down this week. Sevenson was on site to perform the quarterly well level measurements on the sites ground water wells including the solvent area. There was no maintenance or measurements taken on the GWTS and air stripper, as they were not functional.

The site's GW levels were taken after the system was shut down for a few days to give the wells time to equalize (we are calling this round of measurements "static levels".)

Next week after the system is restarted and has run for a few days, we will take another round of level measurements and then have a basis for comparison.

Also this week Sevenson was asked to help troubleshoot the pump atRW-5.

We got it to work on "Manual"; however the auto switch at the well head would not stay in the auto position, Rob Meyer has been notified and is in contact with Olin E&I staff about the problem.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1					
RW-2					
RW-3					
PR-4					
RW-4					
RW-5					
PR-12					
OBA-9AR					

CARBON VESSEL PRESSURE READINGS				
	SP#1	SP#2	dP	
GAC #1				
	SP#3	SP#4		
GAC #2				
TOTAL GAC SYSTEM		Diff,Pr		
FLOW RATE		GPM		
OBA-9AR TOTALIZER				

PH Readings:				Acid level: 50%
RW-1				
PR-4				
PH Adj. Tanks				
Air Stripper level Sensor Cleaned?				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 12	CONTRACT NO. **1113 Div 4**		DATE: 3/25/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 28**	**Max: 39**

Work performed this week:

Monday: Sevenson was on site to respond to a high level alarm in the secondary containment piping at RW-5. Water was bailed out of the pipe sump and the alarm was reset.
The pump at RW-1 was down that morning also. Chris pulled the pump for inspection, it was discovered that acid had eaten away the fitting connecting the pump to the hose and piping. The fitting was replaced and during the start up testing, it was also discovered that there was some internal damage that was not allowing the pump to push water, even though it was still running. After disassembly and inspection, internal damage suggested that we replace the pump; a new one was ordered and will be installed on Friday.

Tuesday: samples were taken from all the wells that feed the GWTS. Samples were also taken from various points within the treatment system at the direction of Tony Englund. Samples were packaged in ice and sent to ALS for analysis.

Wednesday: Performed the weekly water level calibrations and cleaned the WWT building in preparation for the upcoming inspection.

Thursday: Active water level data collection for the site that were supposed to be today had gotten postponed due to necessary maintenance on the GWTS.
Decanted more water from the drums of spent GAC. Collected samples of the spent GAC for characterization analysis, per Rob Meyer request.

Friday: Taking advantage of the snow melt, Sevenson continued with the survey and inspection of the ground water wells. Obvious repairs of note are OBA-6A, PN-10A, and OBA-26A. These are flush mount wells that will need new covers. Sevenson will be doing another round of water level data collections next week and will inspect for further damages.
Replaced the pump in GW well RW-1. Rob has notified the Olin electricians that the electrical leads for this pump need to be rewired.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1					
RW-2	556.9	14.83	15.01	556.77	4.97
RW-3	557.2	12.55	12.62	557.11	0.71
PR-4	555.7	13.40	13.67	555.70	1.9
RW-4	557.2	12.41	12.45	557.39	0.65
RW-5	557.2	12.42	12.51	557.09	8.56
PR-12	557.4		12.37	557.26	4.80
OBA-9AR	557.1	12.16	12.92	557.14	1.20

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	14	6
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	14.6	**Diff,Pr**	
FLOW RATE	44.1	**GPM**	
OBA-9AR TOTALIZER	1257301		

PH Readings:				Acid level: 50%
RW-1	6.91			
PR-4	7.73			
PH Adj. Tanks	7.56	7.45	7.30	
Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 13	CONTRACT NO. **1113 Div 4**		DATE: 3/31/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 25**	**Max: 35**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).
Other site activities are as follow:
Tuesday: The GWTS was off when Chris arrived, possibly due to low air flow alarm. The system was restarted.
Acid washed RW-4 and PR-12
Walked around the plant and found a couple of well lids in the area where the snow was plowed to and then melted. Replaced them in their proper locations.
Friday: Made adjustments to the expandable plug on well BH-1 and secured the plug and lock.
Repaired tubing on acid pump in PR-4 shed, re-primed and started the pump.
Repaired the flush mount well box and lid at OBA-6C.

We are planning on measuring and recording the water levels in wells plant wide on Tuesday 4/7/15. This will be done with the system running for at least 48 hrs, prior to.
Please contact Mike Walker or Chris Jones if there will be any maintenance shut downs or other issues that will interrupt this event. Thank you. 716-284-0431.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.9	14.42	15.35	557.54	1.21
RW-2	556.9	14.80	15.02	556.73	5.12
RW-3	557.1	12.52	12.58	556.86	0.65
PR-4	555.2	13.42	13.65	555.71	1.7
RW-4	556.8	12.59	12.25	556.83	0.59
RW-5	557.4	12.29	12.32	557.23	5.23
PR-12	557.7		12.36	557.36	4.71
OBA-9AR	557.1	12.18	12.91	557.14	1.10

CARBON VESSEL PRESSURE READINGS				
	SP#1	**SP#2**	**dP**	
GAC #1	30	14	16	
	SP#3	**SP#4**		
GAC #2	14	10	4	
TOTAL GAC SYSTEM	20.7	**Diff,Pr**		
FLOW RATE	40.2	**GPM**		
OBA-9AR TOTALIZER	1260091			

PH				Acid level: 30%

Readings:				
RW-1	9.01			
PR-4	7.56			
PH Adj. Tanks	7.89	7.56	7.90	
Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 15	CONTRACT NO. **1113 Div 4**		DATE: 4/13/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 38**	**Max: 54**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).
Other site activities are as follow:

Monday: Sevenson on site to record weekly water levels. Notice pump at PR-4 was down. After trouble shooting decided it was a pump issue. Acid washed PR-12.

Tuesday: Removed the pump from PR-4, inspected and replaced the pump (but not the motor), It ran fine after reinstalling the pump /motor assembly. The old pump head will be disassembled and cleaned/inspected to see if we can resurrect it and keep it as a spare. Also pulled and cleaned pump at RW-1.

Wednesday: Cleaned the trays in the air stripper with a solution of dilute HCl.

Friday: Bailed out the secondary containment piping at RW-4, approximately 500 ml. Air stripper flow was strong. Disassembled and cleaned the old pump head from PR-4.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.8	13.96	14.89	557.84	1.04
RW-2	556.9	14.72	14.88	556.81	5.23
RW-3	557.1	12.41	12.50	556.94	0.61
PR-4	555.2	13.40	13.61	555.70	2.2
RW-4	556.8	12.35	12.29	557.03	0.65
RW-5	557.4	12.18	12.24	557.37	5.32
PR-12	557.6		12.28	557.32	4.55
OBA-9AR	557.1	12.20	12.93	557.11	1.70

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	15	5
	SP#3	**SP#4**	
GAC #2	15	8	7
TOTAL GAC SYSTEM	16.8	**Diff,Pr**	
FLOW RATE	52	**GPM**	
OBA-9AR TOTALIZER	1268589		

PH Readings:				Acid level: 80%
RW-1	8.78			
PR-4	6.77			
PH Adj. Tanks	7.12	7.38	7.49	

Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 16	CONTRACT NO. **1113 Div 4**		DATE: 4/22/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 35**	**Max: 47**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).
Other site activities are as follow:

Monday: Sevenson onsite filled one dumpster with debris from excavation at RW-5.

Tuesday: Completed RW-5 cleanup, prepared for installation of concrete pad at RW-5.

Wednesday: Poured concrete pad at RW-5, Did weekly water level calibration and site inspection.

Thursday: Installed union fittings on the 1" air vent pipe that runs from the top of the air stripper to pH adjust tank #2. Also snaked out the piping to check for any obstructions. There were no obstructions, but there was foam coming out of the pipe.

Friday: Performing "treatability study" on pH tank effluent water to determine the dosage of anti-foaming agent needed to reduce foaming of water in the air stripper.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	558.0	14.06	15.08	557.78	0.99
RW-2	557.0	14.68	14.89	556.84	5.02
RW-3	557.3	12.38	12.45	557.01	0.63
PR-4	556.6	12.98	13.37	556.66	2.6
RW-4	557.0	12.35	12.22	557.17	0.71
RW-5	557.6	12.12	12.17	557.42	5.17
PR-12	557.7		12.19	557.67	5.07
OBA-9AR	557.1	12.22	12.95	557.09	1.80

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	14	6
	SP#3	**SP#4**	
GAC #2	14	10	4
TOTAL GAC SYSTEM	9.5	**Diff,Pr**	
FLOW RATE	54	**GPM**	
OBA-9AR TOTALIZER	1274006		

PH Readings:				Acid level: 50%

RW-1	7.34			
PR-4	6.65			
PH Adj. Tanks	7.75	7.27	7.51	
Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 17	CONTRACT NO. **1113 Div 4**		DATE: 4/28/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 44**	**Max: 60**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).
Other site activities are as follow:

Tuesday: Chris Jones was on site, checked the system for foaming by taking a water sample out of the sample port between pH adjust tank #2, and the air stripper, and also checked the air vent in the piping between pH tank 2 and the stripper. No foam was found.
Secondary containment piping for RW-4 showed just a trace of water in it.
Acid washed RW-5 and PR-12.
Installed a new lid on flush mount well OBA-26B.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.9	14.32	15.20	557.63	1.12
RW-2	557.0	14.67	14.85	556.82	5.17
RW-3	557.2	12.40	12.43	556.99	0.67
PR-4	556.0	13.55	13.69	556.02	2.4
RW-4	557.0	12.38	12.29	557.14	0.68
RW-5	557.5	12.22	12.25	557.32	1.26
PR-12	557.6		12.25	557.62	4.98
OBA-9AR	557.1	12.22	12.95	557.09	1.80

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	15	5
	SP#3	**SP#4**	
GAC #2	10	10	0
TOTAL GAC SYSTEM	9.2	**Diff,Pr**	
FLOW RATE	44	**GPM**	
OBA-9AR TOTALIZER	1277155		

PH Readings:				Acid level: 20%
RW-1	7.45			
PR-4	6.67			
PH Adj.	7.10	7.67	7.30	

Tanks				
Air Stripper level Sensor Cleaned? no				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 18	CONTRACT NO. **1113 Div 4**		DATE: 5/6/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 40**	**Max: 66**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).
Other site activities are as follow:

Tuesday: Performed transducer calibrations on pumping wells and piezometers. Notice a trace of water in the secondary containment piping at RW-4. Verified that all GW wells have been labeled and secured.

Wednesday: Pulled the pump at RW-5 due to low flow, cleaned intake, reinstalled the pump. We will now monitor the flow to see if there is any improvement.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.8	14.42	15.37	557.52	1.18
RW-2	557.0	14.75	15.01	556.79	5.95
RW-3	557.2	12.45	12.52	555.96	0.63
PR-4	555.5	14.02	14.22	555.52	2.5
RW-4	556.9	12.50	12.55	557.02	0.60
RW-5	557.4	12.29	12.32	557.26	0.42
PR-12	557.3		12.32	557.55	4.96
OBA-9AR	557.1	12.22	12.95	557.10	1.50

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	15	5
	SP#3	**SP#4**	
GAC #2	11	10	1
TOTAL GAC SYSTEM	11.9	**Diff,Pr**	
FLOW RATE	47	**GPM**	
OBA-9AR TOTALIZER	1281952		

PH Readings:				Acid level: 10%
RW-1	6.98			
PR-4	6.60			
PH Adj. Tanks	7.18	7.24	7.38	

Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 19	CONTRACT NO. **1113 Div 4**	DATE: 5/14/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 44**	**Max: 63**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:

Tuesday: Rob Meyer notified us via email that the air stripper was running, but the DCS was showing 0 cfm air flow. Chris Jones cleared the induction lines and managed to get the flow reading to 700 cfm. . There was a violent rain storm the evening before, some water may have found its way into the lines and possible the air flow gauge.

Wednesday: Sevenson was onsite to perform the annual air blower inspection. Photos have been sent to Rob Meyer. The inspection showed no wear on the fan rotor, fan wheel, silencer or intake parts. All bolts were secure and no vibration was evident. The induction lines were again blown out with air. Subsequently the air flow readings rose to 1100 cfm.
Sevenson also pulled the pump at RW-5. We noticed a black hard scale has developed in the piping at the hotbox end of the line (mainly built up on the stainless steel sections), We cleared the line and reinstalled the pump. We did not see any improvement in flow at the flow meter. After more troubleshooting, we came to the conclusion that the flow meter was not registering proper flow. Possibly due to scaling in the flow tube. Or poor grounding. Rob Meyer has sent a request to Olin Maintenance for assistance with the meter. Presently the pump at RW-5 is running, but the flowmeter is registering about 0.3 gpm.

Thursday: Sevenson was onsite to perform the weekly well level readings and to do the weekly system inspection. RW-4 had a trace of water in the secondary containment. He also did some more trouble shooting at RW-5.
Chris took a small sample of the black scale in the piping at RW-5 to our lab to do some informal testing on it for characterization analysis.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.7	14.48	15.41	557.57	1.06
RW-2	557.0	14.70	14.95	556.83	5.86
RW-3	557.2	12.44	12.55	555.96	0.61
PR-4	555.6	14.04	14.27	555.54	2.5
RW-4	556.9	12.51	12.56	557.04	0.66
RW-5	557.5	12.23	12.30	557.25	0.30
PR-12	557.2		12.31	557.57	4.83
OBA-9AR	557.1	12.20	12.95	557.11	1.40

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	10	10
	SP#3	**SP#4**	
GAC #2	14	10	4
TOTAL GAC SYSTEM	12.6	**Diff,Pr**	
FLOW RATE	45	**GPM**	
OBA-9AR TOTALIZER	1286773		

PH Readings:				Acid level: 40%
RW-1	6.43			
PR-4	6.33			
PH Adj. Tanks	7.01	7.12	7.20	
Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 20	CONTRACT NO. **1113 Div 4**		DATE: 5/20/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 49**	**Max: 68**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:

Tuesday: Performed weekly site inspection and water level measurement recording.RW-4 containment piping had a trace of water in it.

Wednesday: Inspected RW-5 piping, looking for any signs of scale building up inside again. ***None were present***. Started the RW-5 pump while we had everything disconnected to see if it was functioning properly, it was. The water coming out of RW-5 was brown like chocolate milk, with fine solids in it, but no odor.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.6	14.43	15.40	557.55	1.34
RW-2	557.1	14.72	14.96	556.84	5.65
RW-3	557.2	12.44	12.57	555.94	0.63
PR-4	555.5	14.02	14.24	555.51	2.5
RW-4	556.9	12.51	12.54	557.01	0.62
RW-5	557.4	12.25	12.31	557.27	0.30
PR-12	557.3		12.33	557.58	4.92
OBA-9AR	557.2	12.22	12.90	557.09	1.30

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	15	5
	SP#3	**SP#4**	
GAC #2	15	14	1
TOTAL GAC SYSTEM	8.3	**Diff,Pr**	
FLOW RATE	42	**GPM**	
OBA-9AR TOTALIZER	1292003		

PH Readings:				Acid level: 20%
RW-1	6.95			
PR-4	6.45			

PH Adj. Tanks	7.11	6.98	7.02	
Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 21	CONTRACT NO. **1113 Div 4**	DATE: 5/26/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 55**	**Max: 74**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:

Tuesday: Performed weekly site inspection and water level measurement recording.RW-4 containment piping had a trace of water in it.
Acid Washed RW-3 and RW-4.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.6	14.84	15.76	557.35	1.46
RW-2	557.0	14.68	14.91	556.82	6.71
RW-3	557.2	12.35	12.39	557.00	0.57
PR-4	555.4	14.03	14.39	555.43	2.6
RW-4	556.8	12.57	12.63	556.94	0.53
RW-5	557.4	12.29	12.31	557.27	0.21
PR-12	557.8		12.28	557.59	4.69
OBA-9AR	557.5	12.11	12.60	557.53	1.20

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	24	15	9
	SP#3	**SP#4**	
GAC #2	10	8	2
TOTAL GAC SYSTEM	16.2	**Diff,Pr**	
FLOW RATE	43	**GPM**	
OBA-9AR TOTALIZER	1293432		

PH Readings:				Acid level: 80%
RW-1	6.82			
PR-4	6.50			
PH Adj. Tanks	7.10	6.68	7.19	

Air Stripper level Sensor Cleaned? yes

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 22	CONTRACT NO. **1113 Div 4**		DATE: 6/02/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 59**	**Max: 79**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:

Tuesday: Performed weekly site inspection and water level measurement recording.
RW-5 was on interlock due to water in the secondary containment.
RW-4 containment piping had a trace of water in it.
Checked RW-5 piping for scaling, there was no significant build up.
Used a "Sludge Judge" to check the contents of pH adjustment tank #1, there was about 4" of very fine solids. Rob sent out pictures earlier this week.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.4	14.66	15.60	557.68	1.39
RW-2	557.0	14.67	14.93	556.83	6.56
RW-3	557.1	12.33	12.40	557.02	0.49
PR-4	555.6	13.21	13.44	556.41	2.3
RW-4	557.0	12.35	12.47	557.10	0.45
RW-5	557.5	12.29	12.33	557.25	0.26
PR-12	557.3		12.39	557.32	4.82
OBA-9AR	556.2	13.26	13.42	556.69	1.20

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	25	20	5
	SP#3	**SP#4**	
GAC #2	15	9	6
TOTAL GAC SYSTEM	12.1	**Diff,Pr**	
FLOW RATE	48	**GPM**	
OBA-9AR TOTALIZER	1296996		

PH Readings:				Acid level: 50%
RW-1	6.39			
PR-4	6.56			

PH Adj. Tanks	6.84	7.38	6.88	
Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 23	CONTRACT NO. **1113 Div 4**		DATE: 6/09/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: <.10"**	**TEMP (Deg F)**	**Min: 63**	**Max: 75**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:

Tuesday: Performed weekly site inspection and water level measurement recording.
The secondary containment alarms for RW-4 are now functional. We will not have to do the weekly checks on this anymore.
The scaling substance that we took from RW-5 has been delivered to Design Water Tech as requested by Tony Englund.
There was no significant build up f solids or scale on any of the fitings at RW-5.
PR-12 was acid washed.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.7	14.37	15.31	557.69	1.34
RW-2	557.0	14.59	14.75	556.92	6.91
RW-3	557.2	12.16	12.20	557.14	0.54
PR-4	555.6	13.29	13.40	556.29	2.4
RW-4	557.0	12.33	12.44	557.11	0.50
RW-5	557.5	12.30	12.35	557.25	0.23
PR-12	557.3		12.41	557.33	4.92
OBA-9AR	556.2	13.22	13.44	556.70	1.20

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	15	5
	SP#3	**SP#4**	
GAC #2	16	10	6
TOTAL GAC SYSTEM	14.2	**Diff,Pr**	
FLOW RATE	45	**GPM**	
OBA-9AR TOTALIZER	1302148		

PH Readings:				Acid level: 20%
RW-1	6.52			

PR-4	6.60			
PH Adj. Tanks	7.14	7.33	7.12	
Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 24	CONTRACT NO. **1113 Div 4**	DATE: 6/16/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 64**	**Max: 83**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:

Tuesday:

There was no significant buildup of solids or scale on any of the fittings at RW-5.
PR-12 was acid washed.
Took Water samples from the wells that feed into the system in Bldg. 73.
Took water samples from Air Stripper influent and effluent sample ports.

Wednesday:

Took water samples from the ground water wells plant wide as per the list supplied by Tony Englund as part of the Annual ground water monitoring event for 2015, including:
OBA-2B, PN15A, PN15B, OBA-16A, OBA-16B

Thursday:

Took water samples from the ground water wells plant wide as per the list supplied by Tony Englund as part of the Annual ground water monitoring event for 2015, including:
PN-14A, PN-14B, DUP01-0615 (Blind Duplicate from PN-14B), PN-12A, PN-12B, OBA-6A, 0BA-6B.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.7	14.37	15.31	557.69	1.48
RW-2	557.0	14.60	14.73	556.94	7.12
RW-3	557.1	12.18	12.27	557.16	0.61
PR-4	555.6	13.26	13.46	556.30	2.5
RW-4	557.0	12.32	12.45	557.13	0.53
RW-5	557.5	12.32	12.37	557.28	0.26
PR-12	557.3		12.43	557.30	4.13

CARBON VESSEL PRESSURE READINGS			
	SP#1	SP#2	dP
GAC #1	24	15	9
	SP#3	SP#4	
GAC #2	15	10	5
TOTAL GAC SYSTEM	16.5	Diff,Pr	
FLOW RATE	48	GPM	
OBA-9AR TOTALIZER	1306993		

OBA-9AR	556.1	13.25	13.48	556.71	1.30

PH Readings:				Acid level: 20%
RW-1	7.23			
PR-4	6.68			
PH Adj. Tanks	7.22	7.18	7.32	
Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 25	CONTRACT NO. **1113 Div 4**		DATE: 6/26/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 63**	**Max: 77**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:
Mon.-Thurs.: Continued with the plant wide groundwater sampling event.
Friday: Performed the weekly inspection including recording the water levels in the wells that feed the GWTS in B-73.
Acid washed RW-4 and PR-12.
Note: there was no significant buildup of solids in RW-5 piping.

The lab is dropping off more sample bottles today. Sampling should be complete by mid next week.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.7	14.80	15.72	557.38	2.10
RW-2	557.0	14.61	14.79	556.85	8.98
RW-3	557.2	12.32	12.37	557.01	0.45
PR-4	556.1	13.44	13.61	556.13	2.4
RW-4	556.8	12.59	12.52	556.94	0.49
RW-5	557.4	12.29	12.34	557.26	0.24
PR-12	557.6		12.23	557.63	4.32
OBA-9AR	556.1	13.25	13.48	556.71	1.20

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	30	20	10
	SP#3	**SP#4**	
GAC #2	14	9	5
TOTAL GAC SYSTEM	20.9	**Diff,Pr**	
FLOW RATE	36	**GPM**	
OBA-9AR TOTALIZER	1313741		

PH Readings:				Acid level: 20%
RW-1	6.39			
PR-4	6.65			
PH Adj. Tanks	7.01	6.98	7.11	

Air Stripper level Sensor Cleaned? no				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 27	CONTRACT NO. **1113 Div 4**		DATE: 7/10/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 63**	**Max: 77**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:

Site wide water levels were completed on Tuesday. While uploading the data from the leveloader in Gill Creek, it was noted that the optical cable was compromised. Tony Englund authorized the purchase of a replacement cable.
Over all the WWTP was running well.
Next week Sevenson is scheduled to pull and clean the pump at PR-12.
The flow rate in RW-3 and RW-4 has dropped. Sevenson will acid wash, and then pull the pumps for inspection if necessary.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.7	14.85	15.79	557.38	1.92
RW-2	557.1	14.58	14.74	556.88	8.13
RW-3	557.2	12.26	12.31	557.02	0.39
PR-4	556.0	13.47	14.07	556.11	2.6
RW-4	556.8	12.54	12.62	556.97	0.47
RW-5	557.5	12.31	12.35	557.30	0.25
PR-12	557.6		12.23	557.68	4.12
OBA-9AR	556.6	13.25	13.54	556.73	1.20

PH				Acid level: 80%

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	15	5
	SP#3	**SP#4**	
GAC #2	12	10	2
TOTAL GAC SYSTEM	8.8	**Diff,Pr**	
FLOW RATE	41	**GPM**	
OBA-9AR TOTALIZER	1322866		

Readings:				
RW-1	6.63			
PR-4	6.55			
PH Adj. Tanks	7.16	7.21	7.18	
Air Stripper level Sensor Cleaned? no				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 28	CONTRACT NO. **1113 Div 4**	DATE: 7/14/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy light rain	**RAINFALL INCHES: <1"**	**TEMP (Deg F)**	**Min: 64**	**Max: 81**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:

Chris Jones pulled the pump at PR-12 for inspection. He found that it was crusted with Calcium Carbonate. He cleaned the pump and reinstalled it.

He acid washed RW-3 and RW-4. Both pumps have shown a decrease in flow; however the water levels are still in range. He will consult with Tony Englund about a possible change out for new pumps.
The air flow of the stripper has slowly been decreasing, but still well above the 650 cfm mark. Chris and Rob Meyer have discussed possibly cleaning the stripper trays again at the end of the summer.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.7	14.81	15.76	557.39	2.13
RW-2	557.0	14.62	14.80	556.85	8.65
RW-3	557.2	12.30	12.36	557.03	0.43
PR-4	556.1	13.45	14.01	556.14	2.6
RW-4	556.8	12.57	12.60	556.95	0.68
RW-5	557.4	12.29	12.38	557.28	0.27
PR-12	557.6		12.23	557.65	5.12
OBA-9AR	556.6	13.25	13.54	556.73	1.20

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	16	4
	SP#3	**SP#4**	
GAC #2	15	11	4
TOTAL GAC SYSTEM	9.3	**Diff,Pr**	
FLOW RATE	45	**GPM**	
OBA-9AR TOTALIZER	1325584		

PH Readings:				Acid level: 30%

RW-1	6.65			
PR-4	6.67			
PH Adj. Tanks	7.01	7.07	6.99	
Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 29	CONTRACT NO. **1113 Div 4**		DATE: 7/22/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 59**	**Max: 83**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:
Some type of event this week has damaged the level transducers at RW-3, RW-5, and OBA-9AR. Also the level readout at the wellbox in RW-5. Replacements for all have been ordered.
Sevenson has received the new optical cable for the Gill Creek Level Loader. It has been installed. Upon Retrieval of the past recorded data. It was noted that the loader stopped recording in January. It may have been from Gill Creek Freezing this year (very cold winter). Last month while doing the annual sampling, Chris pulled the probe, inspected and cleaned it as it had a buildup of silt on the optical lens. Tony Englund has been sent the downloaded data.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.4	15.02	15.97	557.18	2.21
RW-2	556.9	14.70	14.88	556.73	8.56
RW-3	568.6	12.41	12.45	568.37	0.39
PR-4	556.3	13.29	13.43	556.33	2.6
RW-4	556.7	12.69	12.62	556.82	0.48
RW-5	542.4	12.43	12.48		0.25
PR-12	557.5		12.33	557.45	5.03
OBA-9AR	559.0	13.57	14.54	559.17	0.5

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	40	30	10
	SP#3	**SP#4**	
GAC #2	20	15	5
TOTAL GAC SYSTEM	20.2	**Diff,Pr**	
FLOW RATE	48	**GPM**	
OBA-9AR TOTALIZER	1330502		

PH Readings:				Acid level: 80%
RW-1	6.50			
PR-4	6.68			

PH Adj. Tanks	7.07	7.21	7.10	
Air Stripper level Sensor Cleaned? no				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 30	CONTRACT NO. **1113 Div 4**		DATE: 7/28/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 73**	**Max: 90**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:

Tuesday: Chris Jones acid washed RW-3, RW-4 andPR-12.

The security guards at Gate 4 noticed that someone had dumped some plastic shelving on the IWS Site grounds and notified Sevenson. The debris was removed.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.3	15.30	16.22	557.01	2.39
RW-2	556.8	14.82	14.97	556.62	7.76
RW-3	568.6	12.51	12.59	568.36	0.35
PR-4	556.3	13.30	13.53	556.34	2.3
RW-4	556.6	12.79	12.68	556.72	0.37
RW-5	542.4	12.57	12.63		0.25
PR-12	557.5		12.34	557.47	5.25
OBA-9AR	559.3	13.59	14.59	559.17	0.5

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	40	30	10
	SP#3	**SP#4**	
GAC #2	20	15	5
TOTAL GAC SYSTEM	21.5	**Diff,Pr**	
FLOW RATE	41	**GPM**	
OBA-9AR TOTALIZER	1334706		

PH Readings:				Acid level: 30%
RW-1	6.56			
PR-4	6.78			
PH Adj. Tanks	6.95	6.96	6.99	
Air Stripper level Sensor Cleaned? no				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 31	CONTRACT NO. **1113 Div 4**		DATE: 8/4/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 70**	**Max: 83**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:
Sevenson performed the Quarterly Maintenance Inspection.
The GAC beds in the GWTS were backwashed.
During the system inspection, it was noted that the flow meter for the GAC feed was not working. It was pulled, inspected and cleaned, then reinstalled. It still did not function properly. Rob Meyer will notify Olin E&I.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.2	15.35	16.26	557.03	2.95
RW-2	556.7	14.83	14.95	556.65	7.86
RW-3	568.6	12.53	12.60	568.38	0.39
PR-4	556.3	13.34	13.66	556.37	2.2
RW-4	556.6	12.73	12.70	556.77	0.33
RW-5	542.4	12.58	12.66		0.24
PR-12	557.4		12.38	557.42	5.11
OBA-9AR	559.3	13.55	14.64	559.22	1.1

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	40	31	9
	SP#3	**SP#4**	
GAC #2	20	14	6
TOTAL GAC SYSTEM	22.4	**Diff,Pr**	
FLOW RATE	38	**GPM**	
OBA-9AR TOTALIZER	133784		

PH Readings:				Acid level: 5%
RW-1	6.71			
PR-4	6.62			
PH Adj. Tanks	6.93	7.12	6.94	

Air Stripper level Sensor Cleaned? yes

Chris Jones

Quarterly Maintenance Inspection

Frequency	System Component	OK	Needs Maintenance / Repair	Noted Deficiency
QUARTERLY				
	Carbon Feed Pump #1	ok		
	Carbon Feed Pump #2	ok		
	Air Stripper Blower	ok		
	1st Stage Mixer	ok		
	2nd Stage Mixer	ok		
	Pulsar Acid Metering Pump - RW-1	ok		
	Pulsar Acid Metering Pump - pH Mix Tank	ok		

Date Inspected: 80415

Inspector: Chris Jones Sevenson

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 32	CONTRACT NO. **1113 Div 4**		DATE: 8/11/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 72**	**Max: 85**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:
The system went down on Monday night/Tuesday morning due to heavy rains and a 7S interlock. Rob restarted the system Tuesday morning.
The flow meter that tracks flow rate from the GAC feed pump is still only working sporadically.
The transducers and the digital readout for RW-3, RW-5, and OBA-9AR have arrived.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.4	15.40	16.32	557.08	3.17
RW-2	557.1	14.57	14.73	556.87	5.25
RW-3	568.5	12.28	12.35	568.30	0.29
PR-4	556.6	13.04	13.20	556.56	2.5
RW-4	557.0	12.32	12.38	557.17	0.28
RW-5	542.4	12.32	12.39		0.24
PR-12	557.6		12.36	557.66	5.43
OBA-9AR	558.9	14.09	14.60	559.00	0.5

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	20	0
	SP#3	**SP#4**	
GAC #2	14	10	4
TOTAL GAC SYSTEM	10.1	**Diff,Pr**	
FLOW RATE	0	**GPM**	
OBA-9AR TOTALIZER	1343963		

PH Readings:				Acid level: 70%
RW-1	6.54			
PR-4	6.94			
PH Adj. Tanks	6.95	7.24	6.86	
Air Stripper level Sensor Cleaned? No				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 33	CONTRACT NO. **1113 Div 4**	DATE: 8/18/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 74**	**Max: 89**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:
Sevenson (Chris) was onsite to look at the air stripper system and see if there was any reason that the air flow was fluctuating. He did the following:
Pulled a sample of the process water from pH tank #2 and also checked the air vent in the piping between pH.Tank#2 and the air stripper. There was no foam present and everything looked normal.
Marked the air stripper sump sight glass in 1" increments. Observed and recorded the inflow and pump out cycles of the air stripper for 3 cycles for any notable surges or abnormalities that could contribute to fluctuations in air or water flow. The results were sent to Tony Englund for evaluation.
Acid washed the well pump for PR-12.
The transducers and the digital readout for RW-3, RW-5, and OBA-9AR have arrived. They are in the B-73 office and are waiting for installation. Rob has filled out a work order.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.4	15.37	16.31	557.09	3.15
RW-2	557.0	14.55	14.68	556.87	5.24
RW-3	568.8	12.28	12.36	568.59	0.30
PR-4	556.4	13.18	13.30	556.44	2.6
RW-4	557.1	12.21	12.25	557.29	0.27
RW-5	542.4	12.32	12.38		0.24
PR-12	557.8		12.30	557.65	5.41
OBA-9AR	558.9	14.12	14.62	559.00	0.6

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	18	2
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	9.5	**Diff,Pr**	
FLOW RATE	0	**GPM**	
OBA-9AR TOTALIZER	1349207		

PH Readings:				Acid level: 25%
RW-1	6.61			

PR-4	6.70			
PH Adj. Tanks	6.74	6.60	6.31	
Air Stripper level Sensor Cleaned? No				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 34	CONTRACT NO. **1113 Div 4**		DATE: 8/25/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 64**	**Max: 75**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:
The flow meter for RW-5 has been replaced. However there is no reading on the DCS, only at the well. Rob has contacted the Olin DCS specialist on the situation. The pump is running strong at 5.7 gpm.
Acid washed Wells RW-3, RW-4 and PR-12.
Backwashed both GAC vessels. The PSI difference went down afterword, but not as much as normal. It may be time to start thinking about a GAC change out.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.3	15.40	16.31	557.09	3.30
RW-2	557.1	14.51	14.69	556.89	5.51
RW-3	568.2	12.23	12.29	568.03	0.29
PR-4	556.8	12.74	12.98	556.84	2.3
RW-4	557.2	12.18	12.27	557.34	0.21
RW-5	542.5	12.31	12.35		5.7
PR-12	557.5		12.18	557.66	5.37
OBA-9AR	558.9	14.12	14.62	559.02	0.6

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	15	5
	SP#3	**SP#4**	
GAC #2	17	10	7
TOTAL GAC SYSTEM	10.4	**Diff,Pr**	
FLOW RATE	0	**GPM**	
OBA-9AR TOTALIZER	1352754		

PH Readings:				Acid level: 25%
RW-1	6.44			
PR-4	6.73			
PH Adj. Tanks	7.02	7.53	6.87	

Air Stripper level Sensor Cleaned? yes				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 35	CONTRACT NO. **1113 Div 4**		DATE: 8/31/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 69**	**Max: 82**

Work performed this week:

Sevenson was onsite this week to measure and record water level readings in the pumping wells that feed the Ground Water Treatment System (GWTS).

Other site activities are as follow:
The pump at RW-4 went down. Sevenson pulled the pump to inspect and found that the motor was OK, but the pump head needs to be replaced. The spare that we had in stock was also not functional, so we had to order a new one. We expect delivery late next week.
During the removal of the RW-4 pump. A small amount of the ground water came in contact with a Sevenson worker. A Near Miss Report has been filed with John Gabrielski of Olin.

Olin E&I have been working on installing the new transducers and the display, although not completed yet.

Item 022415.01: During the GAC change out, it was discovered that the sump pump inside the secondary containment area in B-73 was not functioning. Rob Meyer has been notified.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.2	15.45	16.36	557.11	3.20
RW-2	557.1	14.53	14.72	556.90	5.20
RW-3	568.2	12.23	12.30	568.03	0.33
PR-4	556.8	12.71	12.95	556.80	2.3
RW-4	557.2	12.20	12.29	557.35	0
RW-5	542.4	12.30	12.36		5.6
PR-12	557.6		12.20	557.66	5.37
OBA-9AR	558.9	14.12	14.62	559.02	0.6

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	25	20	5
	SP#3	**SP#4**	
GAC #2	14	10	4
TOTAL GAC SYSTEM	12.4	**Diff,Pr**	
FLOW RATE	0	**GPM**	
OBA-9AR TOTALIZER	1358970		

PH Readings:				Acid level: 65%
RW-1	6.77			
PR-4	6.61			
PH Adj.	7.12	7.67	6.99	

Tanks				
Air Stripper level Sensor Cleaned? no				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO.	CONTRACT NO.	DATE: 9/9/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: rain in morning then clear	**RAINFALL INCHES: 0.18 in**	**TEMP (Deg F)**	**Min: 64**	**Max: 78**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

John Wright was on site this week to perform the weekly calibrations of the level transducers and do the inspection. Mike Walker was onsite to assist.
The water level sensor used to determine groundwater levels in the wells and piezometers had caught on something about 13' below TOC at piezometer RW-1. We tried to shake it loose, but it was hung up on something in the well (possibly rotted out well screen?).We tried to pull up and remove the level transducer also to make more room for the sensor removal, but that was stuck also. We tried a few tricks to get them loose but nothing worked, Eventually the wires came loose from both the transducer and the level sensor and they fell to the bottom of the well. Sevenson is trying to find a pipe of the appropriate diameter to insert down the well shaft that will push the well screen back into shape and give us room to install a new transducer to operate RW-1 . In the meantime, the well pump is running in manual mode.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1					
RW-2	557.0	15.51	15.80	556.87	6.13
RW-3	556.6	12.31	12.35	556.39	0.33
PR-4	556.9	12.68	12.91	556.89	2.7
RW-4	557.3	12.08	12.08	557.43	Off
RW-5	557.8	12.35	12.46	557.49	5.6
PR-12	557.4		12.17	557.60	5.11
OBA-9AR	556.6	13.19	14.03	556.40	0.7

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	34	19	15
	SP#3	**SP#4**	
GAC #2	14	10	4
TOTAL GAC SYSTEM		**Diff,Pr**	
FLOW RATE		**GPM** not working	
OBA-9AR TOTALIZER	1364144	GPM	

PH Readings:				Acid: 40%
RW-1	7.02			
PR-4	6.71			
PH Adj. Tanks	6.97	6.75	6.84	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 35	CONTRACT NO.	DATE: 9/15/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 62**	**Max: 80**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Monday: Noted that over the weekend, the GWTS had shut down a couple of times due to the heavy rains and the interlock with the 7S sump. By Monday early afternoon the system was back to normal operations. The system was never down for more than 12 hours in a row.

Chris Jones was on site to test the new RW-4 pump in preparation to installing it when the crane is available.

The air stripper shut down the system a couple of times that day due to low air flow.

Chris adjusted the flow on the carbon feed pump which helped the air flow and the system ran fine after that.

Olin Maintenance was able to repair the RW-5 flow meter. It is now fully functional; and can be read at the DCS and recorded in the RTX & PI.

Tuesday: The pH in the adjustment tanks were reading high. Chris increased the acid pump feeding into RW-1 and decreased the flow rate at RW-1. This leveled off the pH in the system. Chris acid washed PR-12. He also took his weekly measurements this day.

Olin maintenance was onsite to install the new level transducer in RW-1. The transducer is now fully functional and RW-1 is back to operating in automatic mode.

Wednesday: Chris was again on site to install the new pump in RW-4. The pump tested OK while above ground. After installation there was no flow. Further investigation determined that there is a column of muck/mud at the bottom of the well and that it is too thick to allow the pump to operate. The well will have to be purged and surged to clean it out and redevelop the well so water will flow. The well pump is now out while the team is planning a solution to the situation.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.3	15.40	16.33	557.10	2.86
RW-2	557.1	14.53	14.71	556.89	5.98
RW-3	556.6	12.31	12.35	556.39	0.35
PR-4	556.9	12.69	12.89	556.85	2.6
RW-4					Off
RW-5	557.7	12.35	12.46	557.52	5.7
PR-12	557.4		12.17	557.64	5.37
OBA-9AR	556.6	13.23	14.06	556.43	0.9

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	40	25	15
	SP#3	**SP#4**	
GAC #2	17	10	7
TOTAL GAC SYSTEM	22.3	**Diff,Pr**	
FLOW RATE		**0**	
OBA-9AR TOTALIZER	1369122	GPM	

PH Readings:				Acid: 10%
RW-1	8.67			
PR-4	6.71			
PH Adj. Tanks	7.98	8.01	8.15	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 36	CONTRACT NO.	DATE: 9/22/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: sunny	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 67**	**Max: 81**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Monday: Went to troubleshoot the problem with the Gill Creek Transducer. It seems that the cable that attaches to the transducer was missing a pin in the connecter that keeps the eyes in alignment. Chris is looking into buying a new one. The transducer had stopped taking readings last January.

Tuesday: Inspected RW-4 well screen with a down hole camera. Looks like ¼ or less of the screen has been compromised.
Weekly system inspection revealed that the level read out in RW-1 is blank.
The acid drum in PR-4's shed is empty and needs replacement.

Thursday: Met onsite with Walker and SJB well drilling rep. Walked thru the wells let the rep know what needed work. He will give us a quote on well rehab.
Cleaned out the air stripper trays with acid magic and a power washer.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	555.8	15.05	15.97		2.51
RW-2	557.0	14.52	14.73	556.85	6.37
RW-3	556.6	12.21	12.27	556.44	0.34
PR-4	556.7	12.82	13.07	556.75	2.5
RW-4					Off
RW-5	557.6	12.32	12.37	557.51	5.7
PR-12	557.9		12.18	557.66	5.06
OBA-9AR	556.6	13.23	14.06	556.43	0.9

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	40	26	14
	SP#3	**SP#4**	
GAC #2	21	14	7
TOTAL GAC SYSTEM	24.0	**Diff,Pr**	
FLOW RATE		**0**	
OBA-9AR TOTALIZER	1373414	GPM	

PH Readings:				Acid: 70%
RW-1	6.60			
PR-4	7.00			
PH Adj. Tanks	7.09	7.12	6.96	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 37	CONTRACT NO.	DATE: 9/30/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 49**	**Max: 62**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Tuesday: Weekly inspection, noticed that the flow in OBA_9AR was low, not high enough to bring the water level down to cycle the pump. The pump normally kicks on at 557.75 and pumps down to about 556.6. With all valves open, the most we could get out of it was 0.9 gpm. Rob was notified.
Acid washed PR-12.

Wednesday: Fabricated a new pin for the Gill Creek level loader harness. Was able to download the data and send the info to Tony for his reports.

Thursday: Replaced the pump motor and electrical leads in OBA-9AR.The pump was running at 5.0 gpm after replacement, and then dialed back to 1.5 gpm to allow for proper cycle times.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	557.4	15.40	16.36		2.91
RW-2	557.1	14.58	14.76	556.88	5.65
RW-3	556.6	12.23	12.28	556.47	0.31
PR-4	556.6	12.85	13.10	556.77	2.7
RW-4					Off
RW-5	557.5	12.33	12.40	557.53	5.5
PR-12	557.1		12.50	557.12	5.15
OBA-9AR	557.4	12.67	12.81	557.44	1.5

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	40	22	18
	SP#3	**SP#4**	
GAC #2	23	12	11
TOTAL GAC SYSTEM	23.8	**Diff,Pr**	
FLOW RATE		**0**	
OBA-9AR TOTALIZER	1377891	GPM	

PH Readings:				Acid: 40%
RW-1	6.62			
PR-4	7.04			
PH Adj. Tanks	7.10	7.12	7.21	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 39	CONTRACT NO.	DATE: 10/13/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 48**	**Max: 69**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Tuesday: Chris Jones was on site to clean the sump in the air stripper. He removed about 12 gallons of sludge from the sump, it is now staged in the fenced in area of B-73 in 3-5 gallon buckets with lids affixed.
After the clean out, Chris started the system and backwashed the 1 and 2 GAC vessels, bringing the differential pressures down to 8 and 5 respectively.

Wednesday: Chris did the weekly inspection of the GW wells. Noticed that the air flow was back to cycling between 970 and 1050 scfm even after the sump was cleaned out. Notified Rick, Tony and Rob.

Thursday: Mike Walker confirmed that Nothnagle Drilling will be on site Monday 10-26-15 to clean out and rehab GW Well RW-4.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	555.4	12.05	12.91		2.66
RW-2	556.9	14.65	14.82	556.72	6.02
RW-3	556.6	12.36	12.40	556.33	0.29
PR-4	556.7	12.88	13.07	556.57	2.8
RW-4					Off
RW-5	557.7	12.47	12.55	557.38	5.8
PR-12	557.5		12.31	557.55	5.31
OBA-9AR	557.0	11.72	12.01	556.99	1.6

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	37	25	12
	SP#3	**SP#4**	
GAC #2	25	19	6
TOTAL GAC SYSTEM	19.3	**Diff,Pr**	
FLOW RATE		**0**	
OBA-9AR TOTALIZER	1389422	GPM	

PH Readings:				Acid: 60%
RW-1	6.81			
PR-4	7.13			
PH Adj. Tanks	7.15	7.17	7.20	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 41	CONTRACT NO. **1094 Div 4**		DATE: 10/27/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 43**	**Max: 66**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Monday: Nothnagle Drilling was onsite to rehab well RW-4. They pumped about 200 gallons of solids laden water from the well and did the surge/purge to redevelop it. Afterwards, the bottom of the well was sounded at 28' depth. Before the work, the well was 21'. This means they evacuated about 7 feet of solids from the well. Reinstallation of the pump and well start up is scheduled for Monday 11/2/15.

Tuesday: Chris Jones was on site to do the regular well level readings.

Thursday: Chris was back on site to test the well pump for RW-4 to make sure everything is ready for Monday when the crane is scheduled.
He applied the Dow 111 sealant to the leaky gasket on the air stripper trays. They leaks slowed dramatically but did not stop totally. Rob wants to monitor the repair and see how the sealant holds up, then make a decision as to reapplying more 111 or order a different product for the repair.
The pump at PR-4 went down. After trying to troubleshoot the pump while in the well, we will pull early next week and replace with a spare,

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	555.4	15.22	16.13		2.68
RW-2	556.8	14.70	14.95	556.86	5.02
RW-3	556.4	12.42	12.38	556.24	0.27
PR-4	556.6	12.62	12.96	556.92	2.8
RW-4					
RW-5	557.4	12.52	12.56	557.32	5.8
PR-12	557.4	-	12.38	557.47	5.25
OBA-9AR	556.5	12.33	12.75	556.56	1.6

PH				Acid level: 80%

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	40	32	8
	SP#3	**SP#4**	
GAC #2	25	15	10
TOTAL GAC SYSTEM	21.6	**Diff,Pr**	
FLOW RATE		**GPM**	
OBA-9AR TOTALIZER	1396951		

Readings:				
RW-1	7.08			
RW-2	7.19			
PH Adj. Tanks	7.29	7.19	7.29	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 42	CONTRACT NO. **1094 Div 4**		DATE: 11/03/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 50**	**Max: 68**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Monday: Sevenson was onsite to replace the pump and motor in RW-4 with the assistance of Olin's crane and operator. By the end of the day flow at RW-4 had reached 1.8 gpm. The flow eventually dropped to 1.1 gpm at the end of the week. Chris took a sounding of the well to check and see if solids were infiltrating and building up in the well bottom. The depth to bottom is holding at approximately 28" for TOC.

Thursday: Replaced the pump and motor for well PR-4, after troubleshooting and system check were unsuccessful. The well was back on line Thursday afternoon; however the acid pump feeding into the well is not keeping its prime.

Friday: Chris was back on site to troubleshoot the acid pump at PR-4. It was determined that the pump head had suffered from years of pumping acid and need to be replaced. He is checking our supply for spares.
In the meantime, acid was added to the well manually and will be as needed. Currently the pH is stable at around 7.0.
The air stripper was down in the morning upon arrival due to low air flow. The airflow was dipping below the 650 cfm mark as the sump filled and the carbon feed pumps kicked on. Chris cleaned the level switches and turned up the flow rate of the carbon feed pumps. This seemed to solve the problem, the system cycled several time after that without the low air flow interlock problem.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	555.4	15.25	16.18		3.02
RW-2	556.8	14.73	14.96	556.88	4.88
RW-3	556.4	12.38	12.45	556.30	0.25
PR-4	556.6	12.75	13.06	556.82	2.1
RW-4	557.2	12.24	12.35		1.10
RW-5	557.5	12.50	12.57	557.36	5.7
PR-12	557.4	-	12.30	557.44	5.12
OBA-9AR	556.5	12.33	12.75	556.56	1.6
PH				Acid level: 40%	

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	40	30	10
	SP#3	**SP#4**	
GAC #2	30	15	15
TOTAL GAC SYSTEM	16.5	**Diff,Pr**	
FLOW RATE		**GPM**	
OBA-9AR TOTALIZER	1404468		

Readings:				
RW-1	6.54			
RW-2	7.02			
PH Adj. Tanks	7.01	7.14	7.18	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 43	CONTRACT NO. **1094 Div 4**	DATE: 11/11/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 42**	**Max: 51**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Wednesday 11/1/15: The GWTS was down upon arrival in the morning. Chris restarted it and got everything back on line.
Acid washed wells PR-4 and PR-12.
Turned on the heaters in the following wells: RW-1, RW-2, RW-5, and PR-12. Also checked the heat tracing on the piping that runs from OBA-9AR to PR-12.
We received notice from Rob Meyer that Olin staff will be replacing the GAC feed pump flow meter with a new on that matches the typical flow meters used at Olin.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	555.4	15.28	16.21		2.92
RW-2	556.8	14.76	14.92	556.85	4.72
RW-3	556.4	12.32	12.41	556.28	0.29
PR-4	556.6	12.72	13.11	556.82	2.3
RW-4	557.2	12.27	12.34		1.56
RW-5	557.5	12.50	12.57	557.36	5.4
PR-12	557.4	-	12.32	557.44	5.06
OBA-9AR	556.5	12.32	12.73	556.56	1.6

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	45	30	15
	SP#3	**SP#4**	
GAC #2	20	15	5
TOTAL GAC SYSTEM	19.3	**Diff,Pr**	
FLOW RATE		**GPM**	
OBA-9AR TOTALIZER	1408967		

PH Readings:				Acid level: 10%
RW-1	6.93			
RW-2	7.11			
PH Adj. Tanks	7.11	7.19	7.23	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 44	CONTRACT NO. **1094 Div 4**		DATE: WE 11/22/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 39**	**Max: 55**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in bldg. 73.

Tuesday 11/17/15: Took weekly water levels for the system.
Acid washed PR-12 and PR-4.

Friday 11/20/15: Onsite at the request of Rob for troubleshooting the air stripper, due to consistant shutdowns, possibly due to low air flow.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	555.4	15.32	16.27		2.84
RW-2	556.8	14.77	14.89	556.87	4.83
RW-3	556.5	12.29	12.41	556.24	0.24
PR-4	556.6	12.69	13.03	556.83	2.1
RW-4	557.2	12.25	12.32		1.56
RW-5	557.5	12.48	12.52	557.41	5.5
PR-12	557.4	-	12.33	557.45	5.11
OBA-9AR	556.5	12.32	12.73	556.56	1.6

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	40	30	10
	SP#3	**SP#4**	
GAC #2	20	15	5
TOTAL GAC SYSTEM	16.2	**Diff,Pr**	
FLOW RATE		**GPM**	
OBA-9AR TOTALIZER	1410941		

PH Readings:				Acid level: 90%
RW-1	6.88			
RW-2	7.02			
PH Adj. Tanks	7.23	7.30	7.35	

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 45	CONTRACT NO. **1133 Div 4**		DATE: WE 11/29/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 34**	**Max: 47**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in ldg.. 73.

Tuesday 11/24/15: Took weekly water levels for the system.
Acid washed PR-12.

A schedule for the upcoming Quarterly sampling and water levels, also the Olin/DuPont GW well sampling has been established for early December.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	555.6	15.29	16.22		2.72
RW-2	556.8	14.75	14.93	556.85	4.73
RW-3	556.5	12.32	12.27	556.75	0.28
PR-4	556.6	12.60	13.07	556.83	2.0
RW-4	557.1	12.29	12.34		1.64
RW-5	557.5	12.45	12.56	557.45	5.5
PR-12	557.4	-	12.35	557.43	5.28
OBA-9AR	556.5	12.32	12.73	556.56	1.5

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	35	20	15
	SP#3	**SP#4**	
GAC #2	15	10	5
TOTAL GAC SYSTEM	18.3	**Diff,Pr**	
FLOW RATE		**GPM**	
OBA-9AR TOTALIZER	1418500		

PH Readings:				Acid level: 50%
RW-1	6.78			
RW-2	7.11			
PH Adj. Tanks	7.02	7.33	7.40	

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 46	CONTRACT NO. **1133 Div 4**	DATE: WE 12/06/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 39**	**Max: 45**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in ldg.. 73.

Wednesday 12/2/15: Took weekly water levels for the system.
Acid washed PR-12.
Installed new acid pump for PR-4 Unable to test it due to lack of electricity at the outlet. Rob Meyer has been notified.
The Sampling event for next week has been pushed back 1 week.
Next week we will be performing a GAC change out.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	555.5	15.31	16.25		2.92
RW-2	556.8	14.79	14.98	556.91	4.94
RW-3	556.5	12.28	12.37	556.31	0.31
PR-4	556.6	12.65	13.15	556.89	1.9
RW-4	557.2	12.27	12.32		1.57
RW-5	557.5	12.44	12.52	557.39	5.6
PR-12	557.3	-	12.29	557.40	5.07
OBA-9AR	556.5	12.30	12.71	556.50	1.5

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	40	20	20
	SP#3	**SP#4**	
GAC #2	20	10	10
TOTAL GAC SYSTEM	19.8	**Diff,Pr**	
FLOW RATE		**GPM**	
OBA-9AR TOTALIZER	1420721		

PH Readings:				Acid level: 10%
RW-1	6.61			
RW-2	7.04			
PH Adj. Tanks	7.05	7.12	7.26	

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 47	CONTRACT NO. **1133 Div 4**	DATE: WE 12/13/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 42**	**Max: 55**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in Bldg. 73.

Tuesday 12/08/15: Sevenson walked thru the WWTS looking reviewing the possible system shutdown and "mothballing" of WWTP equipment.
Primed acid pump in PR-4.
Decanted drums containing purge water from the development of GW well RW-4.
Took Weekly readings from GW well level sensors.

Wednesday 12/09/15: Sevenson on site to evacuate GAC from the 2 GAC vessels.

Thursday 12/10/15: Sevenson on site to install fresh GAC in the GAC vessels. Drummed the spent GAC in Disposal Drums. Drums are now staged in B-73, they will be decanted and sampled next week for characterization. Replaced damaged pipe nipple on Sample Port #3 on GAC unit #2.

Friday 12/11/15: Sevenson on site to backwash the new GAC and restart the GWTS, Make sure everything gets back on line.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	555.6	15.28	16.27		2.40
RW-2	556.7	14.74	14.93	556.90	2.96
RW-3	556.8	12.32	12.40	556.35	0.15
PR-4	556.5	12.83	13.21	556.90	1.9
RW-4	557.3	12.29	12.36		1.24
RW-5	557.5	12.42	12.55	557.39	5.9
PR-12	557.3	-	12.24	557.42	4.63
OBA-9AR	556.5	12.36	12.82	556.54	1.6

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	20	20	10
	SP#3	**SP#4**	
GAC #2	20	15	5
TOTAL GAC SYSTEM	12.1	**Diff,Pr**	
FLOW RATE		**GPM**	
OBA-9AR TOTALIZER	1423603		

PH Readings:				Acid level: 80%
RW-1	7.10			
RW-2	6.66			
PH Adj.	7.15	7.23	7.45	

Tanks				

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 48	CONTRACT NO. **1133 Div 4**	DATE: WE 12/20/15		
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 44**	**Max: 57**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in Bldg. 73.

Tuesday 12/15/15: Sevenson performed the Olin Quarterly Sampling round, including the wells that feed the WWTS, Pre and post Air Stripper, and Pre and Post GAC units. Sevenson also sampled OBA-8B, OBA-11B, OBA-7B, for VOC's. . Samples were picked up by the ALS labs courier on Thursday 12/17/15.

Wednesday 12/16/15: Sevenson sampled the following wells on CHEMOURS Property: 22B, 20B, 19B, 16B, and 5B for VOC's. Samples were picked up by ALS courier on Thursday 12/17/15.

Thursday 12/17/15: Sevenson took plant wide ground water levels. Also took and recorded GW levels on Solvent's property.

Friday 12/18/15: Sevenson downloaded the Gill Creek water levels and barometer readings off the "level logger". Data will be sent to Tony Englund.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	555.7	15.35	16.32		2.27
RW-2	556.8	14.78	14.94	556.93	3.14
RW-3	556.6	12.30	12.42	556.29	0.19
PR-4	556.6	12.72	13.13	556.84	2.0
RW-4	557.2	12.25	12.33		1.56
RW-5	557.5	12.45	12.53	557.43	5.2
PR-12	557.4	-	12.34	557.46	4.72
OBA-9AR	556.5	12.36	12.82	556.54	1.6

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	25	20	5
	SP#3	**SP#4**	
GAC #2	20	15	5
TOTAL GAC SYSTEM	16.3	**Diff,Pr**	
FLOW RATE		**GPM**	
OBA-9AR TOTALIZER	1428702		

PH Readings:				Acid level: 80%
RW-1	6.71			
RW-2	6.89			
PH Adj. Tanks	7.03	7.07	7.13	

Chris Jones

Site Activities Report

Sevenson Environmental Services, Inc.
Niagara Falls, New York

REPORT NO. 49	CONTRACT NO. **1133 Div 4**		DATE: WE 12/27/15	
PROJECT TITLE	**OLIN CORPORATION, BUFFALO AVE. GWTP**			
LOCATION OF WORK	**BUFFALO AVENUE, NIAGARA FALLS, NEW YORK**			
DESCRIPTION	**SUPPORT O & M OF GROUND WATER TREATMENT PLANT**			
WEATHER: partly cloudy	**RAINFALL INCHES: NA**	**TEMP (Deg F)**	**Min: 41**	**Max: 52**

Work performed this week:

Sevenson was on site this week to measure and record ground water levels in the wells that feed the WWTS in Bldg. 73.

Wednesday 12/23/15: Sevenson was on site to do the weekly inspection and water levels.
Seven drums of spent GAC from the WWTS were decanted of free water and a composite sample of the media was taken and delivered to Rob Meyer of Olin.

OLIN Building #73 WWTP Pumping Well Data Sheet

	APEX	PIEZ.	WELL	READOUT	FLOW
RW-1	555.5	15.31	16.26		2.40
RW-2	556.7	14.75	14.91	556.95	3.12
RW-3	556.6	12.28	12.33	556.37	0.17
PR-4	556.6	12.61	13.02	556.90	1.8
RW-4	557.2	12.29	12.36		2.09
RW-5	557.5	12.41	12.50	557.45	5.4
PR-12	557.4	-	12.31	557.49	4.35
OBA-9AR	556.5	12.36	12.82	556.54	1.7

CARBON VESSEL PRESSURE READINGS			
	SP#1	**SP#2**	**dP**
GAC #1	30	20	10
	SP#3	**SP#4**	
GAC #2	20	12	8
TOTAL GAC SYSTEM	15.4	**Diff,Pr**	
FLOW RATE		**GPM**	
OBA-9AR TOTALIZER	1429008		

PH Readings:				Acid level: 50%
RW-1	6.59			
RW-2	6.70			
PH Adj. Tanks	6.90	7.20	6.98	

Chris Jones