COMMITMENT & INTEGRITY
DRIVE RESULTS

980 Washington Street, Suite 325
Dedham, Massachusetts 02026
www.woodardcurran.com

T 800.446.5518
T 781.251.0200
F 781.251.0847

January 9, 2020

Sent Via Electronic Mail Only

Mr. Richard Fisher
USEPA Project Coordinator
Environmental Protection Agency – Region 1, New England
Five Post Office Square, Suite 100
Boston, MA 02109-3912

Subject: Monthly Design Progress Report No. 114 – December 2019
Blackburn & Union Privileges Superfund Site
Walpole, MA

Dear Mr. Fisher:

This Monthly Progress Report is submitted to the United States Environmental Protection Agency (USEPA) and Massachusetts Department of Environmental Protection (MassDEP) in compliance with reporting requirements (Section XI, paragraph 31) of the Consent Decree, Civil Action No. 1:10-cv-11263 for the Blackburn & Union Privileges Superfund Site located in Walpole, Massachusetts. This Report covers the period from December 1 - 31, 2019, and is submitted on behalf of the Settling Defendants to the Consent Decree.

Please contact one of the designated Project Coordinators (David Kelley 774.284.2207 or Paul Bucens 617.899.0354) should you have any questions concerning this Report.

Sincerely,

Eric E. Hultstrom
Woodard & Curran – Supervising Contractor

Attachment

CC: Jennifer McWeeney, MassDEP
Melissa Ranieri – Town of Walpole
David Kelley – Covidien (Project Coordinator)
Paul Bucens – W.R. Grace & Co.- Conn. (Project Coordinator)
Clayton Smith – de maximis
Noah Shaffer, Philip Shaffer Family Corp

MONTHLY DESIGN PROGRESS REPORT No. 114
BLACKBURN & UNION PRIVILEGES SUPERFUND SITE
For December 2019

Report Date: January 9, 2020

This Monthly Progress Report is submitted to the U.S. Environmental Protection Agency (USEPA) and Massachusetts Department of Environmental Protection (MassDEP) documenting the activities completed during the month of December 2019 at the Blackburn & Union Privileges Superfund Site.

1. Activities that have been taken toward achieving compliance with the Consent Decree (including work plans, plans and other deliverables completed and submitted to USEPA/MassDEP):

a. At the West of South Street Site, continued full-time operation of the groundwater treatment system, and continued treatment system optimization activities. A summary of system operations metrics and maintenance notes from July through December 2019 are attached as Table 1. Sampling of the influent and effluent of the treatment system was performed each month from July through December 2019. A summary of the analytical results is attached, with influent results in Table 2 and effluent results in Table 3. Discharge criteria for each constituent were met except for one result for silver on October 21, 2019[1].

b. On December 11, 2019 submitted the updated 2019 Inspection and Maintenance Plan to USEPA.

c. On December 13, 2019 submitted a supplement to the Remedial Action Construction Completion Report – Groundwater, Surface Water, and Former Mill Tailrace (Remedial Construction Report). The supplement to the Remedial Construction Report includes information previously omitted from, or revised since, the draft submittal to USEPA on September 19, 2019.

d. On December 13, 2019 submitted to the USEPA a report from the fall 2019 post-restoration vegetative monitoring inspection of the restored wetland area at the Former Mill Tailrace (FMT).

e. Continued preparation of a construction completion report for the Lewis Pond Sediment and Floodplain Soil Remedial Action.

f. Continued preparation of a report from the visual inspection and shape measurements of the culvert.

g. Continued preparation of a report following completion of a surface water and groundwater monitoring event at the site on October 10, 2019.

h. Continue review of proposed use limitations and land area to be subject to such limitations with USEPA, MassDEP, and the Town of Walpole. Commenced title search and land survey of certain lots and land features.

2. Summary of results of sampling, tests and all other data received or generated:

a. See 1.a., above.

[1] There were no indications that the silver result above the discharge criterion was related to system performance as supported by: a.) the influent concentration was less than the reported effluent concentration; b.) silver is not a reported component of the process chemicals; and, c.) there has been no detections of silver in prior or subsequent GWTS samples.

3. Activities planned for the next month and schedule update:

a. Planned activities associated with the Groundwater and Surface Water remedy, West of South Street include continue full-time operation of the groundwater treatment system.

b. Continue preparation of a draft construction completion report for the Lewis Pond Sediment and Floodplain Soil Remedial Action.

c. Continue report preparation from the detailed visual inspection and shape measurements of the culvert.

d. Continue report preparation from the surface water and groundwater sampling event conducted at the Site.

e. Continue review of proposed use limitations and land area to be subject to such limitations with USEPA, MassDEP, and the Town of Walpole and conduct of title search and land survey, accordingly.

f. Start preparation of the sitewide Operations and Maintenance Plan.

4. Delays encountered or anticipated that may affect the future schedule for implementation of the work and associated mitigation efforts:

a. None this reporting period.

5. Work plan or schedule modifications proposed to USEPA or approved by USEPA:

a. Per e-mail correspondence on November 7, 2019 and concurrence from USEPA on November 12, 2019, the frequency of the Site progress reports will be revised to quarterly beginning in 2020.

6. Activities undertaken in support of the Community Relations Plan during the previous month and planned for the following month:

a. The Settling Defendants will continue to support USEPA in its communications with the local residents and other stakeholders relative to remedial action implementation. This includes providing updates on the work completed at the West of South Street Site and at the Lewis Pond Site.

Table 1: Treatment Plant Operations Metrics and Repair/Maintenance Notes

July 2019	
Average Flow Rate (including downtime): 2.8 gpm	Gallons treated during month: 124,690
Runtime (days): 27.2	Runtime %: 88%
Microfiltration (MF) System Membrane Cleaning Conducted: 7/1, 7/5, 7/9, 7/11, 7/15, 7/18, 7/22, 7/24, 7/26, 7/29, 7/31	
Other repair/maintenance activities:	
7/10/19	• Removal of plugged carbon from lead GAC vessel • Repair of leak at threaded fitting on discharge of filter press feed pump (P-303)
7/19/19	• Removal of obstruction at the pump in the groundwater collection sump

August 2019	
Average Flow Rate (including downtime): 3.2 gpm	Gallons treated during month: 142,560
Runtime (days): 30.2	Runtime %: 97.4%
Microfiltration (MF) System Membrane Cleaning Conducted: 8/1, 8/5, 8/8, 8/12, 8/15, 8/19, 8/21, 8/23, 8/27, 8/30	
Other repair/maintenance activities:	
8/15/19	• Scraping and removal of solids buildup on walls of transfer tank T-205 • Removal of plugged carbon from lead GAC vessel • Repair of leak at threaded fitting on discharge of filter press feed pump (P-303)
8/25/19	• Due to leak of tubing at pump, replaced pump tubing at magnesium chloride peristaltic pump P-801 and lubricated roller head
8/27/19	• Replacement of pump tubing and roller head at magnesium chloride peristaltic pump P-801 as new tubing replaced on 8/25/19 had failed due to wear and restricted movement of the roller head

September 2019	
Average Flow Rate (including downtime): 3.1 gpm	Gallons treated during month: 133,380
Runtime (days): 30	Runtime %: 100%
Microfiltration (MF) System Membrane Cleaning Conducted: 9/3, 9/6, 9/9, 9/12, 9/13, 9/16, 9/19, 9/23, 9/27, 9/30	
Other repair/maintenance activities:	
9/3/19	• Replacement of inoperable/faulty hydraulic pump for the filter press
9/8/19	• Removal of plugged carbon from lead GAC vessel
9/26/19	• Conducted supplemental sampling and testing to evaluate calcium chemistry of the influent groundwater.

October 2019	
Average Flow Rate (including downtime): 2.9 gpm	Gallons treated during month: 128,430
Runtime (days): 29.1	Runtime %: 97%
Microfiltration (MF) System Membrane Cleaning Conducted: 10/3, 10/7, 10/10, 10/14, 10/17, 10/21, 10/24, 10/28, 10/31	
Other repair/maintenance activities:	
10/3/19	• Replacement of pump tubing and roller head at magnesium chloride peristaltic pump P-801 as tubing failed due to wear and restricted movement of the roller head
10/7/19	• Removal of plugged carbon from lead GAC vessel
10/10/19	• Repair of cracked PVC pipe and leaking Victaulic coupling on the MF system • Replacement of section of transparent permeate tubing on the MF system as tubing had become opaque • Added supplemental pipe supports to sludge transfer line to reduce vibration of line

Table 1: Treatment Plant Operations Metrics and Repair/Maintenance Notes

November 2019	
Average Flow Rate (including downtime): 3.0 gpm	Gallons treated during month: 131,480
Runtime (days): 29.3	Runtime %: 98%
Microfiltration (MF) System Membrane Cleaning Conducted: 11/4, 11/6, 11/8, 11/11, 11/12, 11/15, 11/18, 11/21, 11/25, 11/27, 11/29	
Other repair/maintenance activities:	
11/8/19	• Removal of plugged carbon from lead GAC vessel
11/12/19	• Replacement of pump tubing and roller head at sulfuric acid peristaltic pump P-803 as tubing failed due to wear and restricted movement of the roller head • Due to leak of tubing at pump, replaced pump tubing at magnesium chloride peristaltic pump P-801
11/25/19	• Repair of cracked PVC pipe and replacement of leaking Victaulic coupling on the MF system with a full circle repair coupling.

December 2019	
Average Flow Rate (including downtime): 2.9 gpm	Gallons treated during month: 123,790
Runtime (days): 27.7	Runtime %: 89%
Microfiltration (MF) System Membrane Cleaning Conducted: 12/3, 12/6, 12/9, 12/12, 12/16, 12/19, 12/23, 12/26, 12/30	
Other repair/maintenance activities:	
12/12/19	• Due to low pressure in the compressed air system, defrosted the refrigerated air dryer and cleaned air filters on the system. • Due to increase in the inlet pressure of the lead carbon vessel from plugging with precipitated solids, replaced the lead carbon vessel with the lag vessel and added a new lag carbon vessel.
12/19/19	• Disassembly and video scope inspection of the MF permeate pipeline to verify clean and no debris and reset of MF pressure setpoints consistent with consultation with Duraflow, the manufacturer of the MF membranes. • Scraping and removal of solids buildup on walls and bottom of transfer tank T-205 • Cleaning and removal of solids from the Filter Press Precoat Tank T-302 • Replacement of the mount for the pH probe in the stage 2 Reaction Tank T-202 with a new stainless-steel mount as the original PVC mount had broken. • Due to leak of tubing at pump, replaced pump tubing at sodium hydroxide peristaltic pump P-802

Table 2 - Groundwater Treatment System Influent Monitoring Results (Unvalidated)

Parameter	Units	7/19/2019	8/19/2019	9/19/2019	10/21/2019	11/18/2019	12/19/2019
Metals							
Aluminum	µg/L	**220**	**199**	**164**	**127**	**149**	**73.8**
Antimony	µg/L	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Arsenic	µg/L	**13.2**	**12.3**	**11.8**	**9.4**	**9.4**	**6.3**
Cadmium	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chromium	µg/L	**1.1 B**	**1.3 B**	**1.1 B**	**1.5 J**	**0.87 J**	**0.85 J**
Copper	µg/L	**4.4**	**4.1**	**3.4 B**	**2.5 J**	**2.5 J**	4.0 U
Iron	µg/L	**4720**	**4600**	**5660**	**6970**	**7790**	**8810**
Lead	µg/L	**3.5**	**3.2**	**2.7**	**2**	**1.6**	**0.74 J**
Mercury	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.11 J**
Nickel	µg/L	**3.8**	**3.6**	**2.9**	**2.9**	**2.8**	**3.4**
Selenium	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Silver	µg/L	1.0 U	1.0 U	1.0 U	**0.2 J**	1.0 U	1.0 U
Zinc	µg/L	10 U	10 U	**5.8 B**	**7.1 J**	10 U	10 U
Total BTEX							
Benzene	µg/L	**2.5**	**2.2**	**1.8**	**1.6**	**1.8**	**1**
Ethylbenzene	µg/L	**1.9**	**1.6**	**1.6**	**1.3**	**1.4**	**0.7 J**
Toluene	µg/L	**2.5**	**2.4**	**2**	**1.5**	**1.8**	**0.71 J**
Total BTEX	µg/L	**10.5**	**9**	**8.1**	**6.5**	**7.5**	**2.42**
Other VOCs							
Methylene chloride	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Trichloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Group I PAHs							
Benzo(a)anthracene	µg/L	0.048[g] U	0.048 U	0.048[g] U	0.050 U	0.049 U	0.048 U
Benzo(a)pyrene	µg/L	0.048 U	0.048 U	0.048 U	0.050 U	0.049 U	0.048 U
Benzo(b)fluoranthene	µg/L	0.048 U	0.048 U	0.048 U	0.050 U	0.049 U	0.048 U
Benzo(k)fluoranthene	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	0.098 U	0.095 U
Chrysene	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	0.098 U	0.095 U
Dibenzo(a,h)anthracene	µg/L	0.095 U	0.095 U	0.095[g] U	0.099 U	0.098 U	0.095 U
Indeno(1,2,3-cd)pyrene	µg/L	0.095 U	0.095 U	0.095[g] U	0.099 U	0.098 U	0.095 U
Total Group I PAHs	µg/L	ND	ND	ND	ND	ND	ND
Group II PAHs							
Acenaphthene	µg/L	**1.790 B**	**1.520**	**1.020**	**1.180**	**1.220**	**1.04[o]**
Acenaphthylene	µg/L	**0.471 B**	**0.379[k] B**	**0.256**	**0.295**	**0.306**	**0.157**
Anthracene	µg/L	**0.0697 JB**	**0.0840[k] JB**	**0.1080**	**0.1200**	**0.135[k] B**	**0.0698 J**
Benzo(g,h,i)perylene	µg/L	0.095 U	0.095 U	0.095 U	0.099 U	0.098 U	0.095 U
Fluoranthene	µg/L	**0.048 BJ**	**0.0584[k] JB**	**0.061 J**	**0.058 J**	**0.058 J**	0.095 U
Fluorene	µg/L	**0.847 B**	**0.855[k] B**	**0.599**	**0.656**	**0.0864[k] JB**	**0.527**
Naphthalene	µg/L	**26.9**	**16.7[k] B**	**13.0**	**12.4**	**12.4**	**5.4**
Phenanthrene	µg/L	**0.515 B**	**0.619[k] B**	**0.570**	**0.583**	**0.695[k] B**	**0.341**
Pyrene	µg/L	**0.054 BJ**	**0.0742[k] JB**	**0.072 J**	**0.062 J**	**0.096 J**	**0.050 J**
Total Group II PAHs	µg/L	**30.695**	**20.3**	**15.7**	**15.4**	**15.0**	**7.6**
Additional Parameters							
pH	s.u.	**6.7**	**7.3**	**7.4**	**7.2**	**7.2**	**7.0**

Notes:

U = Analyte not detected. Sample lower reporting limit is shown.

J = Estimated concetration below sample lower reporting limit.

B = Indicates analyte found in associated method blank

ND = No detections in group of parameters that have a group discharge limit. The sum of the reporting limits for all parameters in the group is less than the discharge criterion for the group.

a = The Effluent Criteria are specified in Appendix L of the Remedial Action Work Plan (RAWP).

b = The effluent criterion for cadmium in Appendix L of the RAWP (0.2 ug/l) is below the achievable reporting limit of the lab using method 6020A or other metals methods. The PAL for cadmium, which is not a Site COC, has been set to the Lab RL for Method 6020A (1 ug/l) as an alternative performance standard.

c = Footnote 7 of Appendix III of the 2010 Massachusetts RGP (MAG910000) states: "Although the maximum value for the individual PAH compounds is 0.0038 ug/l, the compliance limits are equal to the minimum level (ML) of the test method used as listed in Appendix VI. The minimum levels listed in Appendix VI range from 0.1 to 5 ug/l for all PAHs depending on test method."

d = This parameter is also limited as total for Group I PAHs

e = This parameter is limited as total for Group II PAHs

f = This parameter is limited as Total BTEX

k = Sample reextracted outside holding time for confirmation

Sample result exceeds discharge criterion

Table 3 - Groundwater Treatment System Effluent Monitoring Results (Unvalidated)

Parameter	Units	Effluent Criteriaa	7/19/2019	8/19/2019	9/19/2019	10/21/2019	11/18/2019	12/19/2019
Metals								
Aluminum	µg/L	87	50 U	50 U	50 U	50 U	50 U	50 U
Antimony	µg/L	5.6	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Arsenic	µg/L	10	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	µg/L	1[b]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chromium	µg/L	11.4	**0.96 J**	**1.2 J**	**0.74 J**	**1.2 J**	**0.71 J**	**0.96 J**
Copper	µg/L	4.4	4.0 U	4.0 U	**1.9 J**	4.0 U	4.0 U	4.0 U
Iron	µg/L	1000	50 U	50 U	50 U	50 U	50 U	50 U
Lead	µg/L	1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Mercury	µg/L	0.9	0.20 U	**0.12 J**	0.20 U	0.20 U	0.20 U	**0.11 J**
Nickel	µg/L	29	**1.6 J**	**1.5 J**	**1.5 J**	**1.6 J**	**1.4 J**	**1.5 J**
Selenium	µg/L	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Silver	µg/L	1.2	1.0 U	1.0 U	1.0 U	**2.2**	1.0 U	1.0 U
Zinc	µg/L	66.6	10 U	10 U	10 U	10 U	10 U	10 U
Total BTEX								
Benzene	µg/L	5 (also Note f)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	µg/L	(Note f)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	(Note f)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Total BTEX	µg/L	100	ND	ND	ND	ND	ND	ND
Other VOCs								
Methylene chloride	µg/L	4.6	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Trichloroethene	µg/L	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Group I PAHs								
Benzo(a)anthracene	µg/L	0.0038[c,d]	0.048[g] U	0.048 U	0.048[g] U	0.049 U	0.049 U	0.048 U
Benzo(a)pyrene	µg/L	0.0038[c,d]	0.048 U	0.048 U	0.048 U	0.049 U	0.049 U	0.048 U
Benzo(b)fluoranthene	µg/L	0.0038[c,d]	0.048 U	0.048 U	0.048 U	0.049 U	0.049 U	0.048 U
Benzo(k)fluoranthene	µg/L	0.0038[c,d]	0.10 U	0.10 U	0.10 U	0.10 U	0.097 U	0.095 U
Chrysene	µg/L	0.0038[c,d]	0.10 U	0.10 U	0.10 U	0.10 U	0.097 U	0.095 U
Dibenzo(a,h)anthracene	µg/L	0.0038[c,d]	0.095 U	0.095 U	0.095[g] U	0.097 U	0.097 U	0.095 U
Indeno(1,2,3-cd)pyrene	µg/L	0.0038[c,d]	0.10 U	0.10 U	0.095[g] U	0.10 U	0.097 U	0.095 U
Total Group I PAHs	µg/L	10	ND	ND	ND	ND	ND	ND
Group II PAHs								
Acenaphthene	µg/L	(Note e)	0.10 U	**0.07 J**	**0.34**	**0.65**	**0.81**	0.10 U
Acenaphthylene	µg/L	(Note e)	0.10 U	**0.0207[k] JB**	**0.06 J**	**0.16**	**0.19**	0.10 U
Anthracene	µg/L	(Note e)	0.10 U	**0.0265[k] JB**	**0.03 J**	0.06 J	**0.0647[k] JB**	0.10 U
Benzo(g,h,i)perylene	µg/L	(Note e)	0.0950 U	0.0950 U	0.0950 U	0.0970 U	0.097 U	0.095 U
Fluoranthene	µg/L	(Note e)	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Fluorene	µg/L	(Note e)	0.10 U	0.10 U	**0.08 J**	**0.40**	**0.51**	0.10 U
Naphthalene	µg/L	20 (also Note e)	0.10 U	**0.432[k] B**	**0.14**	**5.17**	**6.83**	**0.05 J**
Phenanthrene	µg/L	(Note e)	0.048 U	0.048 U	**0.075**	**0.317**	**0.446[k] B**	**0.030 J**
Pyrene	µg/L	(Note e)	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Total Group II PAHs	µg/L	100	ND	**0.55**	**0.73**	**6.7**	**8.8**	**0.04**
Additional Parameters								
pH	s.u.	6.5 - 8.3	**7.1**	**7.6**	**7.0**	**7.4**	**7.4**	**7.8**

Notes:

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J = Estimated concetration below sample lower reporting limit.

B = Indicates analyte found in associated method blank

ND = No detections in group of parameters that have a group discharge limit. The sum of the reporting limits for all parameters in the group is less than the discharge criterion for the group.

a = The Effluent Criteria are specified in Appendix L of the Remedial Action Work Plan (RAWP).

b = The effluent criterion for cadmium in Appendix L of the RAWP (0.2 ug/l) is below the achievable reporting limit of the lab using method 6020A or other metals methods. The PAL for cadmium, which is not a Site COC, has been set to the Lab RL for Method 6020A (1 ug/l) as an alternative performance standard.

c = Footnote 7 of Appendix III of the 2010 Massachusetts RGP (MAG910000) states: "Although the maximum value for the individual PAH compounds is 0.0038 ug/l, the compliance limits are equal to the minimum level (ML) of the test method used as listed in Appendix VI. The minimum levels listed in Appendix VI range from 0.1 to 5 ug/l for all PAHs depending on test method."

d = This parameter is also limited as total for Group I PAHs

e = This parameter is limited as total for Group II PAHs

f = This parameter is limited as Total BTEX

k = Sample reextracted outside holding time for confirmation

Sample result exceeds discharge criterion