O'neill, Christopher (DEC)

From: O'neill, Christopher (DEC)
Sent: Monday, April 15, 2019 2:28 PM
To: FES
Cc: james.j.smith@saint-gobain.com; Bogardus, Sara (HEALTH); McLaughlin, Scarlett E (HEALTH); Deming, Justin H (HEALTH); Tinsley, Dusty R (DEC); Mustico, Richard X (DEC)
Subject: RE: Supplemental Site Investigation Workplan Addendum - Former Norton Company (Restoration Site), HW#401010

NYSDEC and NYSDOH have reviewed the Supplemental Site Investigation Workplan Addendum (Addendum) which you submitted on April 11, 2019, regarding the Norton Company site (#401010).
The Addendum satisfactorily addresses our comments; therefore, please implement the Supplemental Site Investigation Workplan Addendum (of April 11, 2019) and the Supplemental Site Investigation Workplan and Proposed Enhanced Fluid Recovery (EFR) Activities (of March 29, 2019) documents.

Please contact me at 518-357-2394 if there are any questions.

Chris O'Neill
NYSDEC – Schenectady
518-357-2394

From: FES [mailto:forensic@chesco.com]
Sent: Thursday, April 11, 2019 9:25 AM
To: O'neill, Christopher (DEC) <christopher.oneill@dec.ny.gov>
Cc: Handford, JoAnne (DEC) <joanne.handford@dec.ny.gov>; james.j.smith@saint-gobain.com; Bogardus, Sara (HEALTH) <Sara.Bogardus@health.ny.gov>; McLaughlin, Scarlett E (HEALTH) <scarlett.mclaughlin@health.ny.gov>; Deming, Justin H (HEALTH) <justin.deming@health.ny.gov>; Tinsley, Dusty R (DEC) <Dusty.Tinsley@dec.ny.gov>; Mustico, Richard X (DEC) <richard.mustico@dec.ny.gov>
Subject: Supplemental Site Investigation Workplan Addendum - Former Norton Company (Restoration Site)

Chris:

Attached is the Supplemental Site Investigation Workplan Addendum for the Restoration Landfill Site for your review. Let us know if you have any questions/comments. Thanks.

Bryan

Bryan J. Machella
Senior Project Manager
Forensic Environmental Services Inc.
Office: 610-594-3940

Forensic Environmental Services, Inc.
113 John Robert Thomas Drive
The Commons at Lincoln Center
Exton, Pennsylvania 19341

Telephone: (610) 594-3940 Telecopier: (610) 594-3943

April 10, 2019

Christopher O'Neill, P.E.
NYS Dept. of Environmental Conservation
Division of Environmental Remediation
1130 North Westcott Road
Schenectady, NY 12306-2014

RE: Supplemental Site Investigation Workplan Addendum
Former Norton Company (Restoration Site) - NYSDEC No. 401010
Crabapple Lane, Colonie, NY 12212
EPA ID No.: NYD 002083954

Dear Mr. O'Neill

Forensic Environmental Services, Inc. (FES), on behalf of Saint-Gobain Corporation (Saint-Gobain), has prepared this *Supplemental Site Investigation (SSI) Workplan Addendum* for the former Norton Company Restoration Site in Colonie, New York in response to your April 9, 2019 technical review correspondence on the *Supplemental Site Investigation Workplan and Proposed Enhanced Fluid Recovery (EFR) Activities* letter report dated March 29, 2019 (see Attachment 1). As described in the March 2019 workplan/report, proposed supplemental site investigation and continued remedial activities at the site include: 1) the installation of two additional temporary wells proximal to newly-installed monitoring well MW-22S; 2) the installation of one conventional overburden monitoring well downgradient of existing monitoring well W-421; 3) a second Enhanced Fluid Recovery (EFR) event at monitoring well W-421; 4) associated soil and groundwater sampling; and 5) preparation of a supplemental site investigation summary report. Proposed monitoring well locations are presented in Figure 1.

Specific comments identified by the NYSDEC in the April 9, 2019 correspondence are presented below in bold/italics with the corresponding FES/Saint-Gobain responses.

1. ***Page 6 of the March 2019 SSI and EFR Plan describes the proposed reduction in the Community Air Monitoring Program (CAMP) as compared to previous approved site activities. The lack of CAMP exceedances during past site work does not negate the potential for air-borne contaminant exposures during future investigative or remedial activities. The previously-approved CAMP procedures need to be continued for all ground-intrusive activities, including the EFR work and the installation of soil borings and monitoring wells/points.***

CAMP activities will be conducted during all applicable ground intrusive and sampling activities (i.e., soil boring and monitoring well installation, and EFR activities) in accordance with the procedures outlined in the NYSDEC-approved *In-Situ Chemical Oxidation (ISCO) and Contingent EFR Pilot Testing Work Plan Addendum* (FES, May 11, 2017), as well as the New York State Department of Health (NYSDOH) and NYSDEC technical review correspondence dated June 1 and June 6, 2017, respectively. Any CAMP exceedances will be immediately reported to the NYSDEC and NYSDOH and appropriate corrective measures will be taken to reduce the potential for exposure. A summary of the CAMP monitoring activities will be presented in the supplemental site investigation summary report.

2. ***The 2018 Landfill Compliance Report provided 1,4-dioxane data and groundwater contour figures from the December 2018 groundwater sampling event. The December 2018 data indicates a groundwater concentration in monitoring well MW-3S of 3.4 µg/L for 1,4-dioxane. One additional temporary shallow groundwater monitoring point is hereby requested easterly from MW-3S toward the offsite residential area to further delineate the 1,4-dioxane presence near MW-3S. This additional well point will need to be installed and sampled similarly to those temporary well points (TWP-5 and TWP-6) proposed for the MW-22S area as part of the March 2019 SSI and EFR Plan.***

   Saint-Gobain and FES concur with the requirement to install an additional monitoring well east (downgradient) of monitoring well MW-3S to further evaluate 1,4-Dioxane concentrations in groundwater; however, in lieu of a temporary monitoring point, a permanent (conventionally-installed) monitoring well is proposed (see Figure 1). The proposed monitoring well (MW-24S) will be installed via standard hollow-stem auger (HSA) drilling methods and constructed of Schedule 40, 2-inch diameter PVC materials. The well screen (0.020 inch slot) will be installed across the water table to allow for any seasonal fluctuations. Clean silica sand (#1 or #2) will be used to fill the well annulus to at least one foot above the top of the screened interval. A bentonite seal will be installed above the gravel pack to prevent surface infiltration, and the remaining well annulus will be grouted to surface. The wellhead will be finished with a stick-up vault secured by a 2-foot by 2-foot concrete skirt and equipped with a locking gripper-plug to prevent unauthorized access. Additional details on the proposed monitoring well installation activities (waste disposal, well development, etc.) will be consistent with the March 29, 2019 *Supplemental Site Investigation Workplan and Proposed EFR Activities* letter report.

3. ***For comparison purposes, existing shallow groundwater monitoring well MW-3S will need to be included in the groundwater sampling events proposed in the March 2019 SSI and EFR Plan.***

In addition to all newly-installed monitoring wells (see Figure 1), existing well MW-3S will be included in the 2019 sampling events. Sampling activities will be conducted in accordance with the procedures outlined in the March 29, 2019 *Supplemental Site Investigation Workplan and Proposed EFR Activities* letter report.

Subsequent to the NYSDEC/NYSDOH review and approval of this addendum, field activities will be scheduled as soon as possible. FES will notify NYSDEC/NYSDOH in advance of any proposed field/sampling activities. If you would like to discuss the proposed activities or have any questions, please call us at (610) 594-3940 or Jim Smith of Saint-Gobain at (610) 893-5667.

Sincerely,

FORENSIC ENVIRONMENTAL SERVICES, INC.

Bryan J. Machella
Senior Project Manager

Thomas F. Maguire, PG
President

cc: James Smith, Saint-Gobain
Rick Mustico, P.E., NYSDEC
Dusty Tinsley, NYSDEC
Sara Bogardus, NYSDOH
S. McLaughlin, NYSDOH
J. Deming, NYSDOH

FIGURES

N

MW-19S
MW-21S
MW-4D
MW-4S
TWP-5
MW-22S
TWP-6
MW-16
MW-23S
W-421
MW-17
SW-1
MW-5
MW-20S
MW-18
MW-13
MW-15
Control Building
MW-3D
MW-3S
MW-24S
MW-6S
MW-6D
MW-2S
MW-2D
MW-9S
MW-9D
MW-12
MW-8S
MW-8D
MW-11
MW-7D
MW-7S

Legend

- Proposed Temporary Wells
- Proposed Monitoring Wells
- Monitoring Wells
- SW Sample
- Slurry Wall

Forensic Environmental Services, Inc.	Fig: 1
Locations of Proposed Monitoring and Temporary Wells Former Norton Co. Restoration Site - Colonie, NY	
0 45 90 180 Feet	Drawn By: MBK Updated: 4/10/2019 Approved By: BM

ATTACHMANT 1

APRIL 9, 2019 NYSDEC CORRESPONDENCE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 4
1130 North Westcott Road, Schenectady, NY 12306-2014
P: (518) 357-2045 | F: (518) 357-2460
www.dec.ny.gov

April 9, 2019

Mr. James Smith
Manager, Environmental Programs
Saint-Gobain Corporation
750 East Swedesford Road
Valley Forge, PA 19482

RE: Norton Company, Town of Colonie, Site # 401010
SSI and EFR Plan and 1,4-Dioxane Data

Dear Mr. Smith:

The New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) have reviewed the March 29, 2019 "Supplemental Site Investigation Workplan and Proposed Enhanced Fluid Recovery (EFR) Activities" document (March 2019 SSI and EFR Plan) for the Norton Company closed landfill site (site #401010). NYSDEC/NYSDOH have also reviewed the "2018 Landfill Compliance Report" dated February 11, 2019. Both the March 2019 SSI and EFR Plan and the 2018 Landfill Compliance Report were submitted on behalf of Saint-Gobain Corporation by Forensic Environmental Services, Inc.

NYSDEC/NYSDOH have the following comments on the March 2019 SSI and EFR Plan and the 2018 Landfill Compliance Report.

i. Page 6 of the March 2019 SSI and EFR Plan describes the proposed reduction in the Community Air Monitoring Program (CAMP) as compared to previous approved site activities. The lack of CAMP exceedances during past site work does not negate the potential for air-borne contaminant exposures during future investigative or remedial activities. The previously-approved CAMP procedures need to be continued for all ground-intrusive activities, including the Enhanced Fluid Recovery (EFR) work and the installation of soil borings and monitoring wells/points.

ii. The 2018 Landfill Compliance Report provided 1,4-dioxane data and groundwater contour figures from the December 2018 groundwater sampling event. The December 2018 data indicates a groundwater concentration in monitoring well MW-3S of 3.4 µg/L for 1,4-dioxane. One additional temporary shallow groundwater monitoring point is hereby requested easterly from MW-3S toward the offsite residential area to further delineate the 1,4-dioxane presence near MW-3S. This additional well point will need to be installed and sampled similarly to those temporary well points (TWP-5 and TWP-6) proposed for the MW-22S area as part of the March 2019 SSI and EFR Plan. (See the attached figures for further information.)

iii. For comparison purposes, existing shallow groundwater monitoring well MW-3S will need to be included in the groundwater sampling events proposed in the March 2019 SSI and EFR Plan.

Please submit an addendum to the March 2019 SSI and EFR Plan that satisfactorily addresses the above comments for NYSDEC/NYSDOH review/approval by April 22, 2019.

Please contact me at 518-357-2394 if there are any questions.

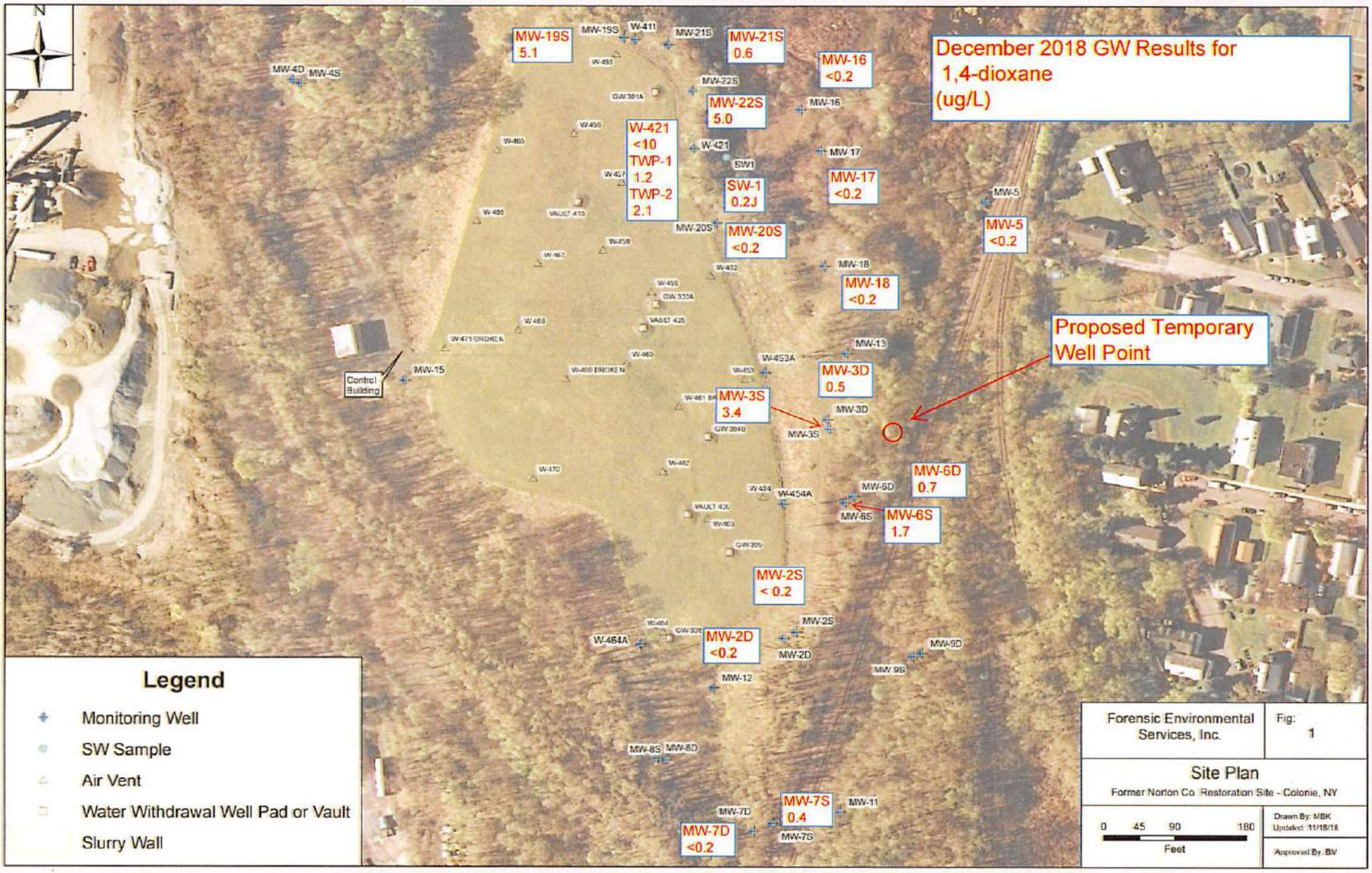
Sincerely,

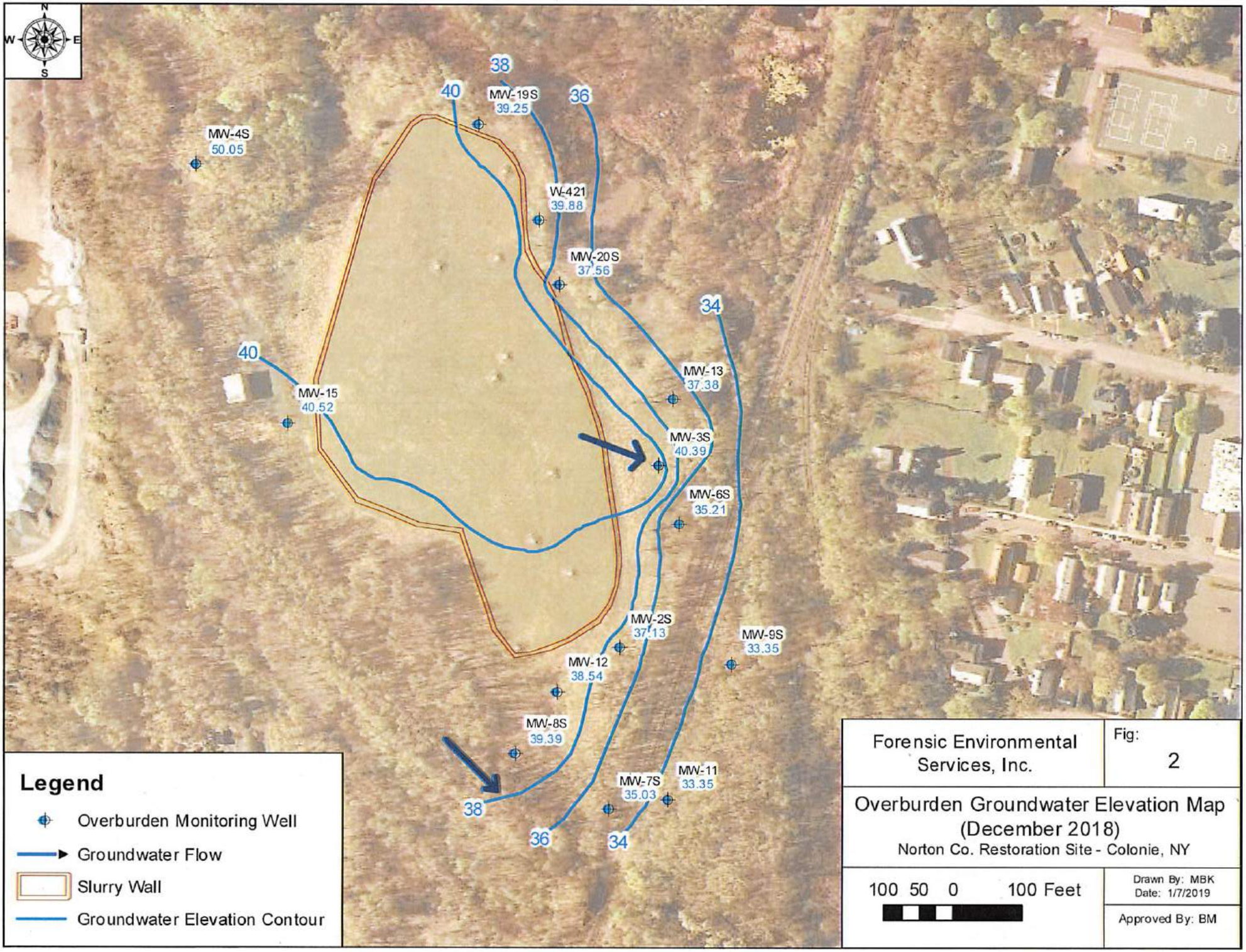
Christopher O'Neill, P.E.
Professional Engineer 1

Attachments

ecc: J. Smith, St. Gobain
T. Maguire, FES
S. Bogardus, NYSDOH
S. McLaughlin, NYSDOH
J. Deming, NYSDOH
D. Tinsley, Esq., NYSDEC
R. Mustico, NYSDEC

2019-04-09.Comment Letter on March 2019 SSI and EFR Plan


December 2018 GW Results for
1,4-dioxane
(ug/L)
MW-19S
5.1
MW-21S
0.6
MW-16
<0.2
MW-22S
5.0
W-421
<10
TWP-1
1.2
TWP-2
2.1
SW-1
0.2J
MW-17
<0.2
MW-5
<0.2
MW-20S
<0.2
MW-18
<0.2
Proposed Temporary
Well Point
MW-3D
0.5
MW-3S
3.4
MW-6D
0.7
MW-6S
1.7
MW-2S
< 0.2
MW-2D
<0.2
MW-7S
0.4
MW-7D
<0.2
Control
Building
MW-4D
MW-4S
MW-15
MW-19S
W-411
MW-21S
MW-22S
MW-16
W-421
SW1
MW-17
MW-5
MW-20S
MW-1B
MW-13
W-453A
MW-3D
MW-3S
MW-6D
W-454A
MW-6S
MW-2S
MW-2D
W-464A
MW-9D
MW-12
MW-8S
MW-8D
MW-7D
MW-7S
MW-11
Legend
Monitoring Well
SW Sample
Air Vent
Water Withdrawal Well Pad or Vault
Slurry Wall
Forensic Environmental Services, Inc.
Fig: 1
Site Plan
Former Norton Co. Restoration Site - Colonie, NY
0 45 90 180
Feet
Drawn By: MBK
Updated: 11/18/18
Approved By: BV


N
W
E
S
38
40
MW-19S
39.25
36
MW-4S
50.05
W-421
39.88
MW-20S
37.56
34
40
MW-13
37.38
MW-15
40.52
MW-3S
40.39
MW-6S
35.21
MW-2S
37.13
MW-9S
33.35
MW-12
38.54
MW-8S
39.39
MW-11
33.35
MW-7S
35.03
38
36
34
Legend
Overburden Monitoring Well
Groundwater Flow
Slurry Wall
Groundwater Elevation Contour
Forensic Environmental Services, Inc.
Fig:
2
Overburden Groundwater Elevation Map
(December 2018)
Norton Co. Restoration Site - Colonie, NY
100 50 0 100 Feet
Drawn By: MBK
Date: 1/7/2019
Approved By: BM

Forensic Environmental Services, Inc.
113 John Robert Thomas Drive
The Commons at Lincoln Center
Exton, Pennsylvania 19341

Telephone: (610) 594-3940 Telecopier: (610) 594-3943

March 29, 2019

Christopher O'Neill, P.E.
NYS Dept. of Environmental Conservation
Division of Environmental Remediation
1130 North Westcott Road
Schenectady, NY 12306-2014

RE: Supplemental Site Investigation Workplan and Proposed Enhanced Fluid Recovery (EFR) Activities
Former Norton Company (Restoration Site) - NYSDEC No. 401010
Crabapple Lane, Colonie, NY 12212
EPA ID No.: NYD 002083954

Dear Mr. O'Neill

Forensic Environmental Services, Inc. (FES), on behalf of Saint-Gobain Corporation (Saint-Gobain), has prepared this letter report to summarize the proposed Supplemental Site Investigation and continued remedial activities at the former Norton Company Restoration Site in Colonie, New York as discussed during a conference call between the New York State Department of Environmental Conservation (NYSDEC), the New York State Department of Health (NYSDOH), Saint-Gobain, and FES on March 15, 2019. Proposed activities include: 1) the installation of two additional temporary wells proximal to newly-installed monitoring well MW-22S; 2) the installation of one conventional overburden monitoring well downgradient of existing monitoring well W-421; 3) a second Enhanced Fluid Recovery (EFR) event at monitoring well W-421; 4) associated soil and groundwater sampling; and 5) preparation of a supplemental site investigation summary report. Relevant soil and groundwater analytical data and a tentative project implementation schedule are presented in Tables 1 through 3. Site location, soil sample location, and proposed monitoring well location maps are presented in Figures 1 and 2. A monitoring well construction diagram is presented in Figure 3.

As described in previously submitted reports, selected volatile organic compounds (VOCs), including, but not limited to: benzene, toluene, ethylbenzene, and xylenes (BTEX) have been detected above applicable NYSDEC soil/groundwater cleanup objectives in the northeastern portion of the site (see Tables 1 and 2 and Figures 2 and 3). In addition, 1,4-Dioxane concentrations at certain locations exceeded the NYSDEC "Screening Level" of 1 microgram per liter (µg/L). The purpose of the proposed supplemental site investigation activities is to 1) evaluate the extent of soil and groundwater impact proximal to soil borings GP-3, GP-3A, and MW-22S; and 2) further investigate the extent of shallow (overburden) groundwater impact downgradient of monitoring well W-421. In addition, based on the post-In-Situ Chemical Oxidation (ISCO) increase in toluene concentrations in monitoring well W-421, a second EFR event will be conducted at that location in April 2019. Proposed activities are described below.

Installation of Temporary Monitoring Points

Two additional temporary monitoring points (TWP-5 and TWP-6) are proposed (see Figure 2). These supplemental monitoring points will be used to: 1) collect representative soil and groundwater samples for laboratory analysis; and 2) provide requisite monitoring data during pilot testing activities (i.e., EFR and ISCO, as appropriate).

Proposed temporary monitoring points will be installed via Geoprobe methods to an estimated total depth of approximately 20 feet (i.e., bedrock refusal). Continuous soil samples will be collected for photoionization detector (PID) screening, subsurface characterization, and the collection of soil samples for laboratory analysis. Subsequent to the collection of soil samples, temporary monitoring points will be installed with an estimated 10 to 15 feet of 1-inch PVC well screen (0.020 inch slot). Clean silica sand (#1 or #2) will be used to fill each well annulus to at least six inches above the top of the screened interval and the remainder of the well annulus will be filled with hydrated bentonite chips in order to: 1) prevent surface infiltration; and 2) minimize the potential for short-circuiting during EFR activities.

Subsequent to installation, well development will be performed by surging and pumping utilizing a submersible or peristaltic pump to remove fine-grained sediments from the sand pack and screen interval. The well will be considered developed when the discharge is clear, after five well volumes have been removed, or after 30 minutes of surging and pumping, whichever comes first. Water generated during of well development will be containerized in properly-labeled 55-gallon drums prior to off-site disposal (see below). In addition, the well will be surveyed to establish horizontal position and vertical elevation to the nearest 0.01 foot by a New York-licensed surveyor.

Soil cuttings and development water generated during the installation of the temporary well points will be temporarily stored in 55-gallon drums prior to proper disposal (see Waste Disposal). Temporary well points will be secured and maintained until they are no longer necessary or conventional monitoring wells are installed. Upon determining that the temporary well points are no longer necessary, FES and Saint-Gobain will pursue NYSDEC approval to properly abandon the well points in accordance with applicable regulations.

Based on currently available information, no underground utilities are present in the proposed drilling areas (see Figure 2); however, utility clearances will be obtained from the Dig Safely New York program prior to conducting any subsurface work. Prior to well installation, a Geoprobe soil boring will be installed at each location and continuous Geoprobe recovery "sleeves" will be collected to facilitate subsurface characterization and to collect soil samples for laboratory analysis. Each soil sample field description will characterize the following soil parameters: 1) composition, 2) consistency and density, 3) color, 4) moisture content, 5) grain size/sorting, and 6) presence/absence of staining, discoloration, odors, and/or historic fill materials (i.e., weathered latex or other recognizable waste materials). Additionally, each soil sample will be field-screened with a PID. Based on field-screening results and visual observations, up to two soil samples will be collected from each boring and submitted for laboratory analysis of VOCs via EPA Method 8260 (including 1,4-Dioxane).

Proposed Supplemental Well Installation

Based on the most recent (December 2018/February 2019) groundwater sampling results from monitoring wells located in the northeastern portion of the site (see Figure 1), one or more VOCs including: BTEX, isopropylbenzene, methylcyclohexane, chloroethane, 1,2-dichloropropane, trichloroethene (TCE), and 1,4-Dioxane exceeded their respective NYSDEC Ambient Water Quality Standards and Guidance Values in selected wells (see Table 2). Although all detected VOCs have historically been below applicable criteria in surface water sample SW-1 and downgradient bedrock monitoring well MW-16, one additional (overburden) monitoring well (MW-23S) is proposed downgradient of well W-421 (approximately 70 feet west of MW-16D) to establish and monitor groundwater conditions in this area (see Figure 2).

It should be noted that during the installation of monitoring well MW-16 in January 2016, competent bedrock was encountered at a depth of approximately 1 foot below grade. Prior to well installation, a Geoprobe soil boring will be installed to: 1) to facilitate subsurface characterization; 2) to collect soil samples for laboratory analysis of VOCs (including 1,4-Dioxane); and 3) determine the approximate depth of groundwater and competent bedrock. If there is sufficient overburden material (i.e., at least 5 to 10 feet) and shallow groundwater is encountered at this location, the proposed monitoring well will be installed via standard hollow-stem auger (HSA) drilling methods to bedrock refusal. All drill cuttings will be temporarily stored in 55-gallon drums prior to off-site disposal (see below). The well will be constructed of Schedule 40, 2-inch diameter PVC well screen (0.020 inch slot) installed across the water table to allow for any seasonal fluctuations, and completed with solid Schedule 40, 2-inch diameter PVC well riser to the surface. Clean silica sand (#1 or #2) will be used to fill the well annulus to at least one foot above the top of the screened interval. A bentonite seal will be installed above the gravel pack to prevent surface infiltration, and the remaining well annulus will be grouted to surface. The wellhead will be finished with a stick-up vault secured by a 2-foot by 2-foot concrete skirt and equipped with a locking gripper-plug to prevent unauthorized access. A typical well construction diagram is presented in Figure 3. Well development and surveying activities will be conducted as described above.

Conversely, if shallow bedrock conditions are encountered, which preclude the installation of a viable overburden monitoring well, an alternate location will be evaluated and reviewed with the NYSDEC/NYSDOH. Alternatively, if an overburden monitoring well cannot be installed, up to two additional surface water locations will be sampled (see Figure 2).

Enhanced Fluid Recovery (EFR) Activities

In accordance with the following NYSDEC/NYSDOH-approved reports: 1) *ISCO Pilot Testing and Contingent EFR Work Plan* (FES, January 10, 2017); 2) *Revised ISCO and Contingent Enhanced Fluid Recovery (EFR) Pilot Testing Work Plan and Response to December 19, 2016 and February 3, 2017 NYSDEC Correspondence Memorandum* (FES, March 31, 2017); and 3) *ISCO and Contingent EFR Pilot Testing Work Plan Addendum* (FES, May 11, 2017), an EFR event was conducted on monitoring well W-421 on August 14, 2018 (see Figure 2).

During the August 14, 2018 EFR event, a total of 440 gallons of groundwater were removed from well W-421. The EFR event included groundwater removal via the use of a drop tube "stinger" for approximately 10 minutes followed by a whole-well vacuum for approximately 4.5 hours (groundwater and vapor removal). Due to the rapid de-watering of the well, the use of the "stinger" was limited and the whole-well vacuum provided a more effective means of contaminant removal via vapor-phase mass removal. EFR activities were summarized in the *Summary of In-Situ Chemical Oxidation (ISCO) and Enhanced Fluid Recovery (EFR) Pilot Testing Activities and 2017 Landfill Compliance Activities* (FES, February 4, 2019).

Subsequent to the October 2017 ISCO activities and August 2018 EFR event, toluene concentrations in monitoring well W-421 increased from 4,900 µg/L in September 2017 (pre-ISCO) to 16,000 µg/L in November 2017 (post-ISCO) to 160,000 in September 2018 (post-EFR). These data indicate that: 1) application of ISCO has caused desorption of VOCs from the soil matrix and/or solubilization of residual-phase light non-aqueous phase liquid (LNAPL); and 2) EFR is inducing transport of dissolved toluene concentrations to the extraction well. Based on these data, a second EFR event is proposed at W-421 for April 2019 (pending site access conditions and contractor availability).

The proposed EFR event at W-421 will be conducted similar to the August 2018 event and will consist of one day (approximately 6 to 7 field hours) of vacuum truck extraction. Prior to EFR activities, baseline PID readings and water level measurements will be collected from monitoring wells W-421, W-451, MW-19S, and MW-20S, as well as all temporary ISCO monitoring points (see Figure 2). Initially, groundwater will be removed from W-421 by inserting a vacuum truck "stinger" (drop tube) into the well to begin removing fluids; however, based on observations during the previous EFR event, the majority of the EFR event will consist of "whole-well" extraction. Applied vacuum readings will be obtained via truck gauge. To allow aquifer conditions to equilibrate, post-test groundwater samples will be collected from well W-421 at least two weeks after the contingent EFR event is completed (see below).

The following field data will be collected from W-421 prior to, periodically during, and subsequent to EFR activities: 1) wellhead PID readings; 2) vacuum and air flow rates; and 3) liquid level measurements. Total fluids recovered will be obtained at the truck (via gauge or tank "stick"). Fluids removed during the vacuum truck event will be transported via the vacuum truck to an off-site facility for proper disposal (see Waste Disposal).

Groundwater Sampling Activities (Newly-Installed Wells and Post-EFR Sampling)

Following a minimum, 2-week equilibration period after well development, two rounds of groundwater samples will be collected from the newly-installed monitoring wells (TWP-5, TWP-6, and MW-23S [if installed]). In addition, post-EFR sampling will be conducted at W-421 a minimum of 2 weeks following the completion of the event and downgradient monitoring wells MW-16 and MW-17 (see Figure 1) will be sampled to confirm the continued absence of VOCs at the downgradient property boundary. Wells will be sampled via the micropurge sampling method using a pump capable of a flow rate of approximately 0.1 to 0.5 liters per minute (i.e., peristaltic/bladder pump) will be used to minimize turbulence in the well bore and hydraulic stress on the formation. The pump will be positioned slightly above the middle of the saturated

portion of the screened interval of each well. Water quality indicator parameters: temperature, pH, specific conductivity, oxidation-reduction potential (ORP), dissolved oxygen (DO), and turbidity will be monitored during purging with a continuous "flow-through" cell device (YSI-600XL).

Purge water readings will be taken every five minutes until the following stabilization rates are achieved: temperature $\pm$ 3%, pH $\pm$ 0.1 standard units, specific conductivity $\pm$ 3%, ORP $\pm$ 10 millivolts (mVs), DO $\pm$ 10%, and turbidity $\pm$ 10% or less than 10 nephelometric turbidity units (NTUs). After the water quality parameters have stabilized, groundwater samples will be collected directly from the pump effluent line using dedicated tubing and pump bladders at each well in a manner that minimizes turbulence in the samples. Groundwater samples will be collected in appropriate laboratory bottleware, properly labeled, logged on a chain-of-custody form, and maintained at 4°C until laboratory receipt via courier. All groundwater samples will be analyzed for VOCs via EPA Method 8260 and 1,4-Dioxane via EPA Method 8260B Selected Ion Monitoring (SIM) and will include Category B laboratory deliverables (Note: the laboratory method detection limit [MDL] for 1,4-Dioxane will be no higher than 0.35 micrograms per liter [µg/L], if possible).

Waste Disposal

All soil cuttings and monitoring well purge/development water generated during the supplemental soil boring and monitoring well installation activities will be containerized in properly labeled 55-gallon drums and moved to a central staging area adjacent to the on-site Control Building (see Figure 1).

Waste characterization soil sampling conducted during the supplemental investigation activities in February 2016 indicated that investigation-derived waste (IDW) materials were characteristically non-hazardous. However, according to the August 30, 2018 NYSDEC technical review correspondence, a new Contained-In Determination is being submitted to facilitate the disposal of the IDW generated during the supplemental site investigation activities.

It is currently anticipated that one to two drums of soil cuttings and one to two drums of purge/development water will be generated during the supplemental site investigation activities. One to two soil samples and one to two groundwater samples will be collected and submitted for laboratory analysis. Soil samples will be analyzed for VOCs via EPA Method 8260 and Toxicity Characteristic Leaching Procedure (TCLP) benzene. IDW groundwater samples will be analyzed for VOCs via EPA Method 8260 (including 1,4-Dioxane). Based on the soil and groundwater analytical results and the NYSDEC review of the "Contained-In" Determination request, IDW generated during the supplemental site investigation activities will be handled accordingly.

With respect to the disposal of purge water that will be generated during the proposed EFR activities, based on the presence of a listed waste (toluene), as well as the previously observed concentrations in W-421 (see Table 2), water generated during EFR activities will be considered "hazardous" and disposed of accordingly at the Tradebe wastewater treatment facility in Bridgeport, Connecticut. Waste manifest documentation will be presented to the NYSDEC in a Supplemental site Investigation Summary Report.

Community Air Monitoring Plan (CAMP) Activities

Community Air Monitoring Plan (CAMP) activities conducted during the August 2018 EFR event and November 2018 soil boring and monitoring well installation activities indicated that all PID and particulate levels were below action levels at both the downwind exclusion zone and downwind site boundary monitoring locations (see Figures 4 through 7) and no fugitive dust emissions or nuisance vapors were identified during either event. Based on these data, Saint-Gobain and FES are proposing to conduct previously-approved CAMP activities (i.e., PID and particulate monitoring) during EFR activities only. Proposed CAMP monitoring during soil boring and monitoring well installation include periodic PID screening at: 1) upwind; 2) downwind exclusion zone; and 3) downwind site property boundary monitoring locations. Any CAMP exceedances will be immediately reported to the NYSDEC and NYSDOH and appropriate corrective measures will be taken to reduce the potential for exposure. A summary of the CAMP monitoring activities will be presented in the supplemental site investigation summary report.

Subsequent to the NYSDEC/NYSDOH review and approval of this workplan, field activities will be scheduled as soon as possible. FES will notify NYSDEC/NYSDOH in advance of any proposed field/sampling activities. If you would like to discuss the proposed activities or have any questions, please call us at (610) 594-3940 or Jim Smith of Saint-Gobain at (610) 893-5667.

Sincerely,

FORENSIC ENVIRONMENTAL SERVICES, INC.

Bryan J. Machella
Senior Project Manager

Thomas F. Maguire, PG
President

cc: James Smith, Saint-Gobain
Rick Mustico, P.E., NYSDEC
Dusty Tinsley, NYSDEC
Bridget Boyd, NYSDOH
Sara Bogardus, NYSDOH
S. McLaughlin, NYSDOH
J. Deming, NYSDOH

TABLES

Table 1
Soil Analytical Results - Volatile Organic Compounds
Former Norton Company Restoration Site
Colonie, New York

Soil Sample Designation	Depth (feet)	Sampling Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	m,p-Xylenes (mg/kg)	o-Xylene (mg/kg)	n-Heptane (mg/kg)	Acetone (mg/kg)	2-Butanone (mg/kg)	1,2-DCA (mg/kg)	PCE (mg/kg)	Isopropyl-benzene (mg/kg)	Methyl-cyclohexane (mg/kg)	MIBK (mg/kg)	1,4-Dioxane (mg/kg)	Carbon Disulfide (mg/kg)	Methylene Chloride (mg/kg)	Methyl Acetate (mg/kg)	VOC TICs (mg/kg)
Geoprobe Samples																				
GP-1	9.5 - 10	1/12/2016	**0.002 J**	<0.001	<0.001	<0.001	<0.001	<0.003	**0.039**	<0.004	<0.001	**0.050**	<0.001	<0.001	<0.003	NA	<0.001	<0.002	<0.002	**0.130 J**
GP-3	14.0 - 14.5	1/12/2016	**11 J**	**4,500**	**46**	**230**	**52**	<18	<42	<24	<5.9	<5.9	<5.9	<5.9	<18	NA	<5.9	<12	<12	**100 J**
GP-5	4.5 - 5.0	1/12/2016	<0.025	**0.490**	**0.064 J**	**0.072 J**	<0.049	<0.150	<0.340	<0.200	**0.140 J**	<0.049	<0.049	<0.049	<0.150	NA	<0.049	<0.098	<0.098	**0.890 J**
GP-3a (Latex Material)	11.5 - 11.7	8/15/2017	**4 J**	**1,600**	**25**	**160**	**32**	**110**	<12	<7.1	<1.8	<1.8	**5.4 J**	**9.8**	<5.3	NA	<1.8	<3.5	<3.5	**560 J**
MW-21	9.0	11/7/2018	**0.003 J**	**0.002 J**	<0.0006	<0.001	<0.0006	**0.049**	**0.100**	**0.01 J**	<0.0009	**0.002 J**	<0.0006	<0.0009	<0.001	<0.053	**0.01**	**0.005 J**	<0.001	**0.420 J**
	12.0	11/7/2018	**1.4**	**3.4**	**0.720**	**18**	**0.320 J**	**0.960**	<0.61	**0.180 J**	<0.61	<0.51	**3.1**	**2.1**	**0.510 J**	<3.8	<0.61	<0.2	**0.480 J**	**130 J**
MW-22	8.5	11/7/2018	**0.003 J**	**0.005 J**	**0.0009 J**	<0.001	<0.0005	**0.005 J**	**0.053**	**0.004 J**	<0.0007	<0.0006	<0.0005	<0.0007	<0.001	<0.045	**0.001 J**	**0.006 J**	<0.001	**0.120 J**
	14.2	11/7/2018	**12 J**	**5,100**	**94**	**540**	**130**	**210**	<50	<8.4	<5	<4.2	**16 J**	**22 J**	**15 J**	<310	<5	<17	<8.4	**940 J**
Waste Characterization Samples																				
MW-21 (Drum)	---	11/7/2018	**1.2**	**2.5**	**0.310**	**7.3**	**0.220 J**	**0.830**	<0.370	<0.610	<0.370	<0.310	**1.4**	**1.1**	**0.170 J**	NA	<0.370	<0.120	**0.130 J**	**33 J**
MW-22 (Drum)	---	11/7/2018	**2.2**	**390**	**9.9**	**57**	**10**	**29**	<1.5	<0.240	<0.150	<0.120	**1.7**	**2.8**	**0.880 J**	NA	<0.150	<0.490	<0.240	**110 J**
Industrial Restricted Use SCO			***89***	***1,000***	***780***	***1,000***		***1,000***	***1,000***	***1,000***	***60***	***300***	***1,000***	***1,000***	***1,000***	***250***	***1,000***	***1,000***	***1,000***	***1,000***
Unrestricted Use SCO			***0.06***	***0.7***	***1***	***0.26***		***100***	***0.05***	***0.12***	***0.02***	***1.3***	***100***	***100***	***100***	***0.1***	***100***	***0.05***	***100***	***100***
Protection of Groundwater SCO			***0.06***	***0.7***	***1***	***1.6***		***1,000***	***0.05***	***0.12***	***0.02***	***1.3***	***1,000***	***1,000***	***1,000***	***0.1***	***1,000***	***0.05***	***1,000***	***1,000***

Notes:

1. mg/kg = milligrams per kilogram; MIBK = methyl isobutyl ketone (4-methyl-2-pentanone); 1,2-DCA = 1,2-dichloroethane; PCE = tetrachloroethylene
   ND = not detected; < ("less than") = analyte not detected above the laboratory method detection limit (MDL);
   J = estimated concentration, SCO = Soil Cleanup Objectives (6 NYCRR Part 375).
2. Samples analyzed for VOCs and tentatively identified compounds (TICs) via EPA Method 8260B.
3. Only detected analytes are listed above. All other analytes were ND. For a complete list of analytes, see the laboratory reports. MDLs for samples GP-3 and GP-3A were elevated due to sample dilution factors.
4. A shaded cell indicates concentration exceeds NYSDEC Protection of Groundwater SCO.

Table 2
Groundwater Analytical Data
Norton Company Restoration Site
Colonie, New York

Well Designation	Sampling Date	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	m,p-Xylenes (µg/L)	o-Xylene (µg/L)	Acetone (µg/L)	2-Butanone (µg/L)	Isopropyl-benzene (µg/L)	Methyl-cyclohexane (µg/L)	Methyl Isobutyl ketone (µg/L)	1,4-Dioxane (µg/L)	VOC TICs (µg/L)	Notes
Standard/Guidance Value		*1.0*	*5.0*	*5.0*	*5.0*	*5.0*	*50*	*50*	*5.0*	*5.0*	*NS*	*1.0 (0.35)**	*NS*	
Monitoring Well Samples														
MW-16	12/5/2018	<0.2	**0.7 J**	<0.4	<1	<0.4	**0.7 J**	<0.3	<0.2	<0.2	<0.5	<0.2	ND	
MW-17	12/5/2018	<0.2	<0.2	<0.4	<1	<0.4	<0.7	<0.3	<0.2	<0.2	<0.5	<0.2	ND	
MW-18	12/5/2018	<0.2	<0.2	<0.4	<1	<0.4	<0.7	<0.3	<0.2	<0.2	<0.5	<0.2	ND	
MW-19S	12/6/2018	**1**	**0.6 J**	**4**	**160**	**16**	<0.7	<0.3	<0.2	<0.2	<0.5	**5.1**	ND	Chloroethane - 6 µg/L; 1,1-DCA - 2 µg/L; PCE - 0.3 J µg/L
MW-20S	12/5/2018	<0.2	<0.2	<0.4	<1	<0.4	<0.7	<0.3	<0.2	<0.2	<0.5	<0.2	ND	
MW-21S	12/6/2018	**13**	**99**	**3**	**39**	**2**	**2 J**	<0.3	**12**	**6**	<0.5	**0.6**	**100 J**	Carbon Disulfide - 0.3 J µg/L; n-Heptane - 2 J µg/L
	2/11/2019	**4**	**44**	**2**	**11**	**0.9 J**	<0.7	<0.3	**6**	**3 J**	<0.5	<0.2	**34 J**	Cyclohexane - 0.5 J µg/L
MW-22S	12/6/2018	**180**	**8,200**	**80**	**470**	**88**	<7	<3	**9 J**	**15 J**	**52 J**	**5.0**	**75 J**	n-Heptane - 34 J µg/L
	2/11/2019	**160**	**8,600**	**100**	**580**	**110**	<14	<6	**12**	**27 J**	**13 J**	**1.9 J**	**110 J**	n-Heptane - 56 J µg/L
W-421	12/5/2018	**740**	**150,000**	**390**	**1,300**	**250**	<18	<8	**10 J**	**14 J**	**190 J**	<10	**160 J**	Carbon Disulfide - 10 J µg/L; Cyclohexane - 5 J µg/L; 1,2-Dichloropropane - 13 J µg/L; n-Heptane - 47 J µg/L; TCE - 6 J µg/L
(Dup)	12/5/2018	**730**	**160,000**	**390**	**1,300**	**260**	<18	<8	**10 J**	**13 J**	**190 J**	<10	**160 J**	Carbon Disulfide - 10 J µg/L; 1,2-Dichloropropane - 15 J µg/L; n-Heptane - 47 J µg/L; TCE - 7 J µg/L
TWP-1	12/5/2018	**48**	**5**	**8**	**15**	<0.4	**7 J**	**2 J**	**16**	**3 J**	<0.5	**1.2**	**300 J**	Carbon disulfide - 0.8 J µg/L; cyclohexane - 0.7 J µg/L; n-Heptane - 3 J µg/L
TWP-2	12/5/2018	**3**	<0.2	<0.4	<1	<0.4	**2 J**	<0.3	**2 J**	**0.8 J**	<0.5	**2.1**	**8 J**	
Surface Water Samples														
SW-1	12/5/2018	<0.2	<0.2	<0.4	<1	<0.4	**1 J**	<0.3	<0.2	<0.2	<0.5	**0.2 J**	ND	

Notes:

1. Monitoring wel samples collected via low-flow techniques and analyzed for VOCs and tentatively identified compounds (TICs) via EPA Method 8260B.
2. Only detected analytes are listed above. All other analytes were ND. For a complete list of analytes, see the laboratory reports.
3. µg/L = micrograms per liter; MEK = methyl ethyl ketone (2-butanone); MIBK = methyl isobutyl ketone (4-methyl-2-pentanone); trichloroethene (TCE); tertachloroethene (PCE); 1,1-dichloroethane (1,1-DCA).
4. NS = No Standard; NA = not analyzed for the indicated parameter; ND = not detected; R = recharge water sample; SW = surface water; Dup = duplicate sample. sample; < ("less than") = analyte not detected above the laboratory method detection limit (MDL); J = estimated concentration, analyte detected below the MDL; detected analyte concentrations in boldface.
5. Additional Standard/Guidance Values as follows: Cyclohexane (NS); Styrene (5 µg/L); Chloroethane (5 µg/L); 1,1-DCA (5 µg/L); PCE (0.7 µg/L); Carbon disulfide (NS); n-Heptane (NS); 1,2-Dichloropropane (1 µg/L); and TCE (5 µg/L)
6. "*" = the applicable Standard/Guidance Value for 1,4-Dioxane includes a NYSDEC "Screening Level" of 1.0 µg/L and an EPA Health Advisory Level of 0.35 µg/L.
7. A shaded cell indicates analyte exceeds applicable NYSDEC criteria.

Table 3

Tentative Project Implementation Schedule

Norton Company Restoration Site

Colonie, New York

	1Q2019			2Q 2019			3Q 2019			4Q 2019		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Supplemental Site Investigation Activities												
Submit Supplemental Site Investigation Workplan												
NYSDEC/NYSDOH Review												
Conduct Enhanced Fluid Recovery (EFR) Event												
Soil Boring and Monitoring Well (Temporary and Conventional) Installation and Associated Sampling Activities												
Post-EFR Sampling Events												
Submit Sampling Results to NYSDEC/NYSDOH												
Meeting/Call to Discuss Data and Proposed Future Activities												
2019 Landfill Compliance Sampling Event												
Submit Supplemental Site Investigation Report												
Submit Landfill Compliance Summary Report												

FIGURES

N

MW-19S
W-411
MW-21S
W-455
MW-4D
MW-4S
MW-22S
GW-301A
MW-16
W-456
W-465
W-421
SW1
MW-17
W-451
W-457
MW-5
GW-302A
W-466
VAULT 410
MW-20S
W-458
W-467
MW-18
W-452
W-459
GW-303A
W-468
VAULT 420
W-471 BROKEN
MW-13
W-460
W-453A
Control Building
MW-15
W-469 BROKEN
W-453
W-461 BROKEN
MW-3D
GW-304B
MW-3S
W-470
W-462
W-454
W-454A
MW-6D
MW-6S
VAULT 430
W-463
GW-305
W-464
GW-306
W-464A
MW-2S
MW-9D
MW-2D
MW-9S
MW-12
MW-8S
MW-8D
MW-11
MW-7D
MW-7S

Legend

- Monitoring Well
- SW Sample
- Air Vent
- Water Withdrawal Well Pad or Vault
- Slurry Wall

Forensic Environmental Services, Inc.	Fig: 1

Site Plan

Former Norton Co. Restoration Site - Colonie, NY

0 45 90 180
Feet

Drawn By: MBK
Updated: 11/16/18

Approved By: BM


N
W
E
S
GP-1
MW-19S
0.6 J
SW-2
MW-21S
99
TWP-5
GP-3
SW-3
MW-22S
8,200
TWP-6
MW-16
0.7 J
5
TWP-4
TWP-1
150,000
160,000
W-421
MW-23S
SW-1
MW-17
ND
TWP-2
TWP-3
ND
ND
GP-5
MW-20S
ND
MW-18
ND
Legend
Proposed Monitoring Well
Proposed Temporary Well
Geoprobe Point
Contingent Surface Water Sample
Surface Water Sample
5 Most Recent Toluene Concentration (ug/L)
Monitoring Well Locations
Temp Wells
Slurry Wall
Forensic Environmental Services, Inc.
Fig: 2
December 2018 Toluene Concentrations
Norton Co. Restoration Site - Colonie, NY
30 15 0 30 Feet
Drawn By: MBK
Date: 3/26/2019
Approved By: BM

FIGURE 3
MONITORING WELL CONSTRUCTION DIAGRAM

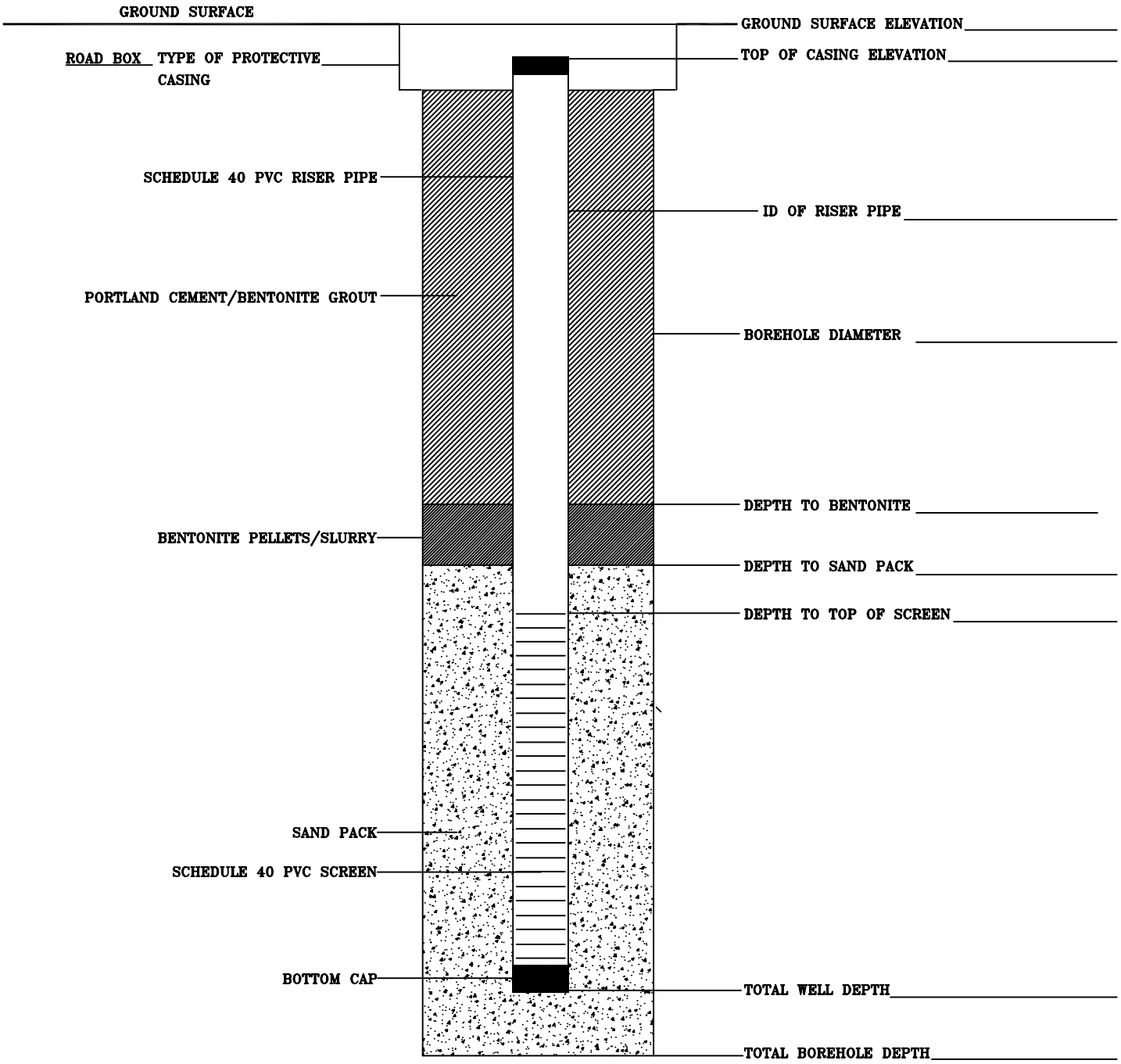
Norton Company Restoration Site
Colonie, New York

DATE OF INSTALLATION _____

DRILLING COMPANY _____

WELL DESIGNATION _____

WELL DESCRIPTION GROUNDWATER MONITORING



MW Log_Blank.dwg

Figure 4
Enhanced Fluid Recovery (EFR) Activities
Community Air Monitoring Program (CAMP) Data - PID
Norton Company Restoration Site
Colonie, New York

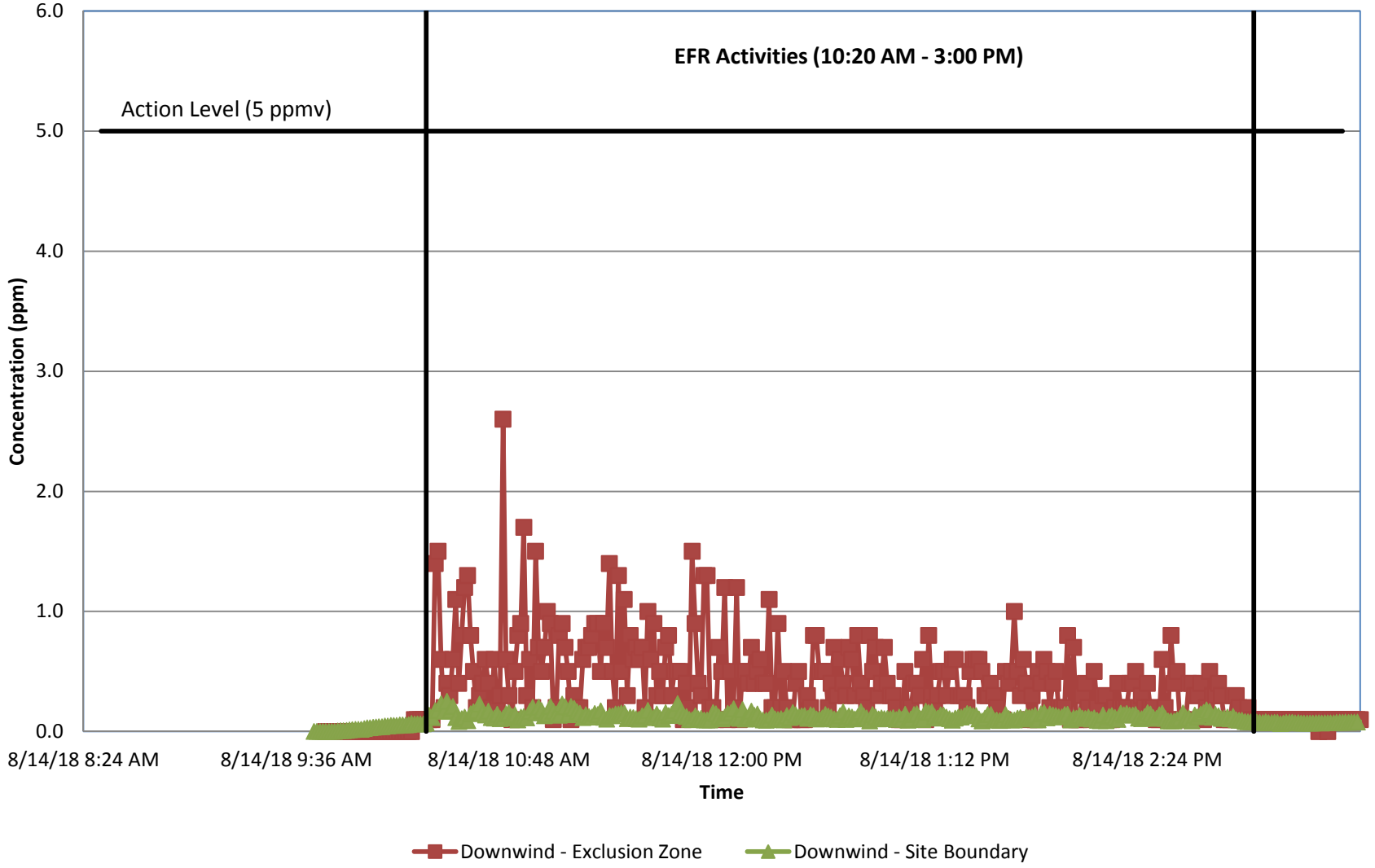


Figure 5
Enhanced Fluid Recovery (EFR) Activities
Community Air Monitoring Program (CAMP) Data - Particulates
Norton Company Restoration Site
Colonie, New York

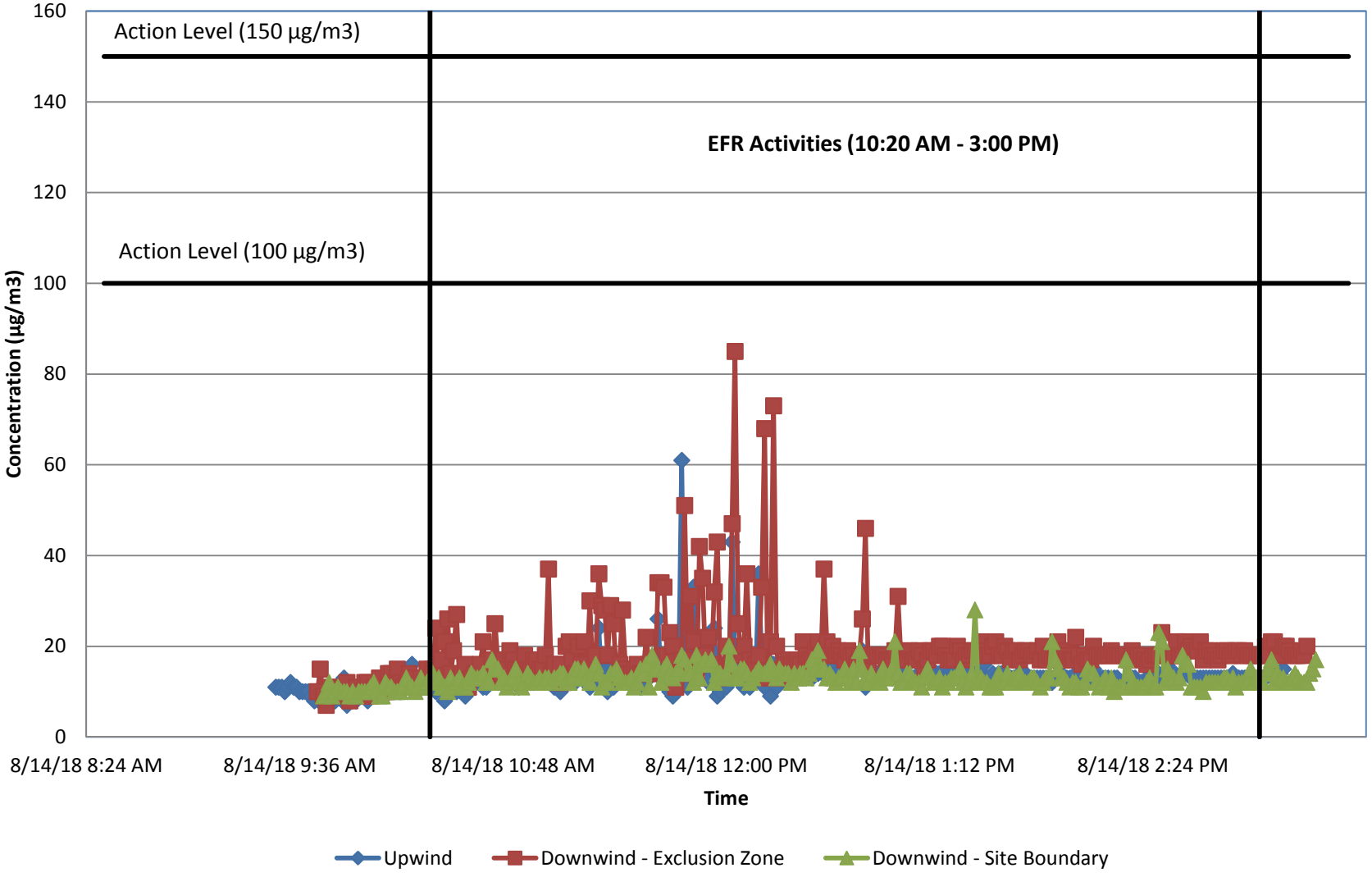


Figure 6
Monitoring Well Installation Activities (MW-21S and MW-22S)
Community Air Monitoring Program (CAMP) Data - PID
Norton Company Restoration Site
Colonie, New York

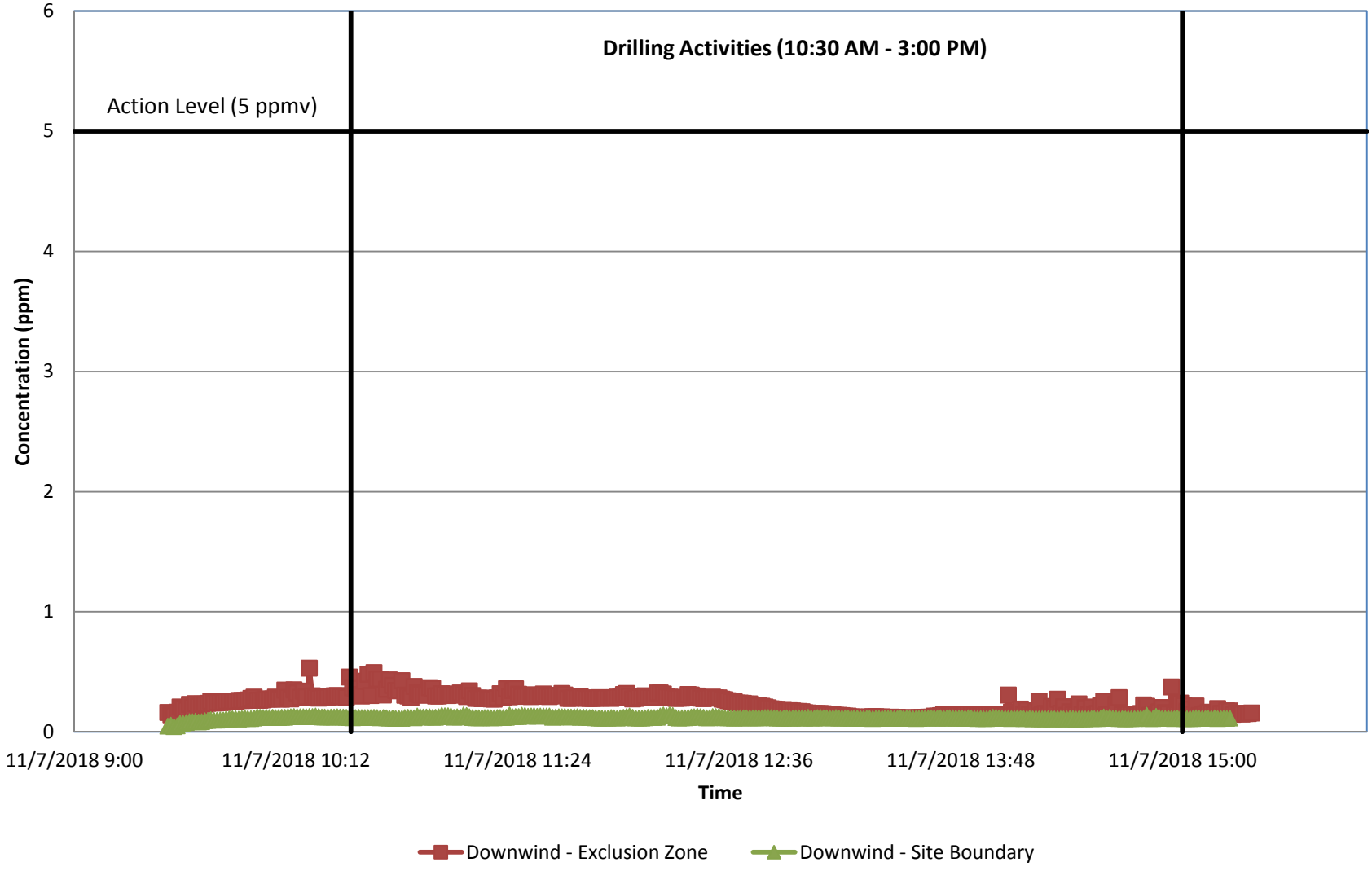


Figure 7
Monitoring Well Installation Activities (MW-21S and MW-22S)
Community Air Monitoring Program (CAMP) Data - Particulates
Norton Company Restoration Site
Colonie, New York