

From: Moline, Kirk <k.moline@ctmale.com>
Sent: Tuesday, April 03, 2018 07:34
To: Shaw, William (DEC); Edwards, Susan L (DEC)
Cc: d.reilly@CTMALE.com; Angier, Christopher; Brian Angerman (bangerman@barr.com); Sara Ramsden (sramsdn@barr.com); Katie Wolohan
Subject: Pending 72 Pumping Test- McCaffrey Street Site

ATTENTION: This email came from an external source. Do not open attachments or click on links from unknown senders or unexpected emails.

Hi Will,

In response to your questions during our call on Monday, March 26, 2018 regarding the IRM Investigative Work – Water Treatment Approach work plan dated November 7, 2017 for the McCaffrey Street Site, the following provides the planned modifications. The details provided in this email reflect the planned discharge of treated water generated during the upcoming multiple well pumping test to the sanitary sewer rather than surface water.

- 1. The list of 14 PFAS will be expanded to the list of 21 PFAS as presented in the table at the bottom of this email.
- 2. There will be a change from the November 6, 2017 plan relative to the sampling frequency. Treated water samples will be collected once per day during the multiple-well pumping test discharge to the sanitary sewer, and once between the lead and lag vessels on the last day of discharge. Influent samples will be collected once per well test, on the last day of each test as shown in the following table.

Water samples will not be collected from the treated water frac tanks currently stored onsite (DEMO-1 and DEMO-2) as they were sampled following completion of the water treatment demonstration test completed in November 2017. The water treatment demonstration testing and sampling results were summarized in a memo to you dated December 6, 2017. This treated water will also be discharged to the sanitary sewer if approved by the Village, or to surface water upon receipt of the SDPES equivalency permit.

Well	Test Description	Day 1	Day 2	Day 3		Day 4	Day 5		
		GAC effluent	GAC effluent	GAC influent	GAC effluent	GAC effluent	GAC influent	GAC effluent	B/W lead/lag vessels
PW-19	72-hour pumping test, one sample collected once per 24 hours of test	x	x	x	x	-	-	-	-
PW-04	72-hour pumping test, one sample collected once per 24 hours of test	-	-	-	x	x	x	x	x

- 3. The November 7, 2017 plan did not go into detail regarding the planned sampling as it was unknown at the time of submission what type of discharge sampling/sampling frequency would apply in the pending SPDES equivalency permit. In addition, a pumping test of well PW-19 was also a contingency in the original testing plan. Step-drawdown testing performed in November 2017 included monitoring of MW-19 which demonstrated that measureable drawdown will be induced in MW-19 during pumping of PW-19. Therefore, the contingent testing of MW-19 will not be performed. The following sampling is proposed for the two, 72-hour pump tests at PW-19 and PW-04. The analyte list for each sample collected is also provided below.

In the full-suite analysis of select samples from the water treatment demonstration test, all results were below detection limits for VOCs, SVOCs, and PCBs. There were four pesticides with low-level results over the respective detection limits, but all four results had qualifiers. As a result, the analyte list has been updated to include the full-suite less VOCs, SVOCs, PCBs, and Pesticides. Please refer to Table 3 of the water treatment demonstration test results memo provided on December 6, 2017 for detailed analytical results.

Multiple-Well Pumping Test Analyte List ¹
Alkalinity
Ammonia-N
Bicarbonate
Calcium
Carbonate
Chloride
Conductivity
Cyanide
Iron
Magnesium
Manganese
Metals ²
pH
Potassium
Sodium
Sulfate
Temperature
Total Hardness
Total Organic Carbon (TOC)
Total Dissolved Solids (TDS)
Total Suspended Solids (TSS)
Turbidity
Perfluorooctanesulfonic acid (PFOS)
Perfluoroundecanoic Acid (PFUnA)
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)
Perfluoropentanoic Acid (PFPeA)
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)
Perfluorohexanoic acid (PFHxA)
Perfluorododecanoic acid (PFDoA)
Perfluorooctanoic acid (PFOA)
Perfluorodecanoic acid (PFDA)
Perfluorohexanesulfonic acid (PFHxS)
Perfluorobutanoic Acid (PFBA)
Perfluorobutanesulfonic acid (PFBS)
Perfluoroheptanoic acid (PFHpA)
Perfluorononanoic acid (PFNA)
Perfluorotetradecanoic acid (PFTA)
Perfluorotridecanoic Acid (PFTriA)
Perfluorooctane sulfonamide (PFOSA)
Perfluoroheptanesulfonic acid
Perfluorodecanesulfonic acid
6:2 Fluorotelomer sulfonate
8:2 Fluorotelomer sulfonate
[1] Water quality to be analyzed for in each sample collected during the multiple-well pumping test.
[2] Target Analyte List (TAL) of metals, including mercury.

If you have any additional questions, please contact me at your convenience.

Thank you, Kirk

Kirk Moline PG

Managing Geologist

Tel 518.786.7502

Cell 518.265.1708

k.moline@ctmale.com

C.T. MALE ASSOCIATES

Engineering, Surveying, Architecture & Landscape Architecture, D.P.C.

50 Century Hill Drive

Latham, NY 12110

Tel 518.786.7400

Fax 518.786.7299

www.ctmale.com

C.T. MALE ASSOCIATES

Engineering, Surveying, Architecture & Landscape Architecture, D.P.C.
50 Century Hill Drive, Latham, NY 12110
518.786.7400 FAX 518.786.7299 www.ctmale.com



November 7, 2017

**Via Email*

Mr. James Moras, P.E.
Section Chief
Section C, Remedial Bureau B
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7015
james.moras@dec.ny.gov

**RE: *IRM Investigative Work - Water Treatment Approach
Groundwater Interception Design
Saint-Gobain, McCaffrey Street Site
14 McCaffrey Street
Village of Hoosick Falls, Rensselaer County
DEC Site No.: 442046***

Dear Mr. Moras:

The purpose of this letter is to outline the proposed water treatment for groundwater generated as part of ongoing investigative work and tests associated with interim remedial measures (IRM) design at the Saint-Gobain Performance Plastics (SGPP) McCaffrey Street facility in Hoosick Falls, New York (the Site). This letter will also support the permitting process for a State Pollutant Discharge Elimination System (SPDES) permit for discharge of treated groundwater at the Site. This letter supersedes the letter dated October 10, 2017 and incorporates comments from NYSDEC in an email dated October 24, 2017. The anticipated surface discharge location at the Site is shown on Figure 1 as SD001.

Based on discussions with the Department, the NYSDEC Division of Water will provide the overall guidance and approval of water treatment and discharge relative to the IRM investigative derived waste liquids in a similar fashion as the waters generated as a function of municipal water well redevelopment (Well #3) in the Village of Hoosick Falls Water Well Field earlier this year. Water generated from ongoing investigative work and IRM development includes:

1. Groundwater generated during the water treatment demonstration test;
2. Investigative-derived waste (IDW) liquids; and
3. Groundwater generated from multiple-well pumping tests.

C.T. MALE ASSOCIATES

November 7 2017

Mr. James Moras, P.E.

Page - 2

Table 1 enclosed with this letter provides a summary of the sources of water that will be generated as part of ongoing investigations IRM planning at the Site, and the water treatment approach proposed for each.

Water Treatment System

It is anticipated that a 30-60 gallon per minute (gpm) capacity mobile, granular activated carbon (GAC) treatment system can be utilized to treat per- and polyfluoroalkyl substances (PFAS) in IDW liquids, accelerated column test residuals, water treatment demonstration test extracted groundwater, and multiple-well pumping tests extracted groundwater, with the following components or equivalent (Figure 2):

- Pre-filter skid (Dual Gradient 50 -5 micron) or other pre-treatment device to be determined after suspended solids analysis.
- Lead GAC vessel (Calgon CYCLESORB FP2, filled with up to 2,000 lbs of Calgon F400 GAC).
- Lag GAC vessel (Calgon CYCLESORB FP2, filled with up to 2,000 lbs of Calgon F400 GAC).
- Influent, Midpoint, and Effluent Water Sampling Ports.

Treated discharge will either be stored in a clean frac tank to allow for sampling and analysis prior to discharge at location SD001, or discharged directly to SD001 as described in the following sections of this letter.

Groundwater from the Water Treatment Demonstration Test

The water treatment demonstration test is described conceptually in the *Data Collection in support of a Groundwater Interception IRM Design* letter dated August 28, 2017 and approved by NYSDEC on September 8, 2017.

The demonstration test will consist of a test of the mobile GAC treatment system described in the previous section, which is intended to supplement the ACT completed by Calgon. The overall objective is to verify the water treatment approach planned for treatment of IDW liquids and groundwater generated from the multiple-well pumping tests described in the next sections, using the same water treatment process and equipment as in the demonstration test. The demonstration test will treat water from two newly-developed pumping wells PW-04 and PW-19. Water will be pumped from the new pumping wells into a frac tank for storage (and incidental aeration and settling of solids) prior to treatment. Prior to treatment system start-up, a water sample from

C.T. MALE ASSOCIATES

November 7 2017

Mr. James Moras, P.E.

Page - 3

the frac tank will be analyzed for the full suite of water quality analytes provided in Table 2 enclosed with this letter.

The water treatment demonstration test will utilize the mobile water treatment system described in the previous section to treat approximately 8,500 gallons of PW-04/PW-19 development water. Following treatment, treated water will be temporarily stored in a clean frac tank to allow for sampling and analysis prior to discharge at location SD001. Treated water samples will be collected after demonstration test groundwater has been treated (approximately 8,500 gallons). Additional sampling will be completed, if required, based on the SPDES discharge permit.

If the demonstration test is effective at treating groundwater from PW-04 and PW-19 to appropriate discharge limits, treatment of the remaining PW-04/PW-19 well development water, IDW liquids, and groundwater generated from the multiple-well pumping tests will follow using the same water treatment equipment, without storage of the treated water. Analytical results from the demonstration test combined with the ACT will be used to obtain regulatory approval and necessary permits for continuous discharge of treated water generated during the multiple-well pumping test and for discharge of treated water generated as part of anticipated full-scale IRMs.

Investigative-Derived Waste Liquids Treatment

Investigative-derived waste (IDW) liquids refers to water generated as part of ongoing investigations at the Site, described in the *Final Remedial Investigation/Feasibility Study Work Plan* dated August 30, 2016, and the *Supplemental Scope of Work* dated May 12, 2017. The IDW liquids consist primarily of monitoring well development and purge water, as well as drilling tool and testing equipment decontamination water. Groundwater is purged from each monitoring well until stabilized field parameter readings are achieved or evacuation of five well volumes of water is complete, whichever occurs first. Purged water is collected into 55-gallon drums and combined in two, 8,500 gallon frac tanks stored at the Site. Additionally, residuals of the accelerated column testing (ACT) conducted by Calgon, and described conceptually in the *Data Collection in support of a Groundwater Interception IRM Design* letter dated August 28, 2017, will be combined with other IDW liquids into the frac tanks stored at the Site.

Prior to IDW treatment, a water sample from each frac tank will be analyzed for the full suite of water quality analytes provided in Table 2 enclosed with this letter. The IDW liquids will be treated using the mobile water treatment system described in the previous section. Treated water samples will be collected once per day during

C.T. MALE ASSOCIATES

November 7 2017

Mr. James Moras, P.E.

Page - 4

discharge and intermittently between the lead and lag vessels to support an assessment of the time to carbon breakthrough. Additional sampling will be completed based on requirements in the SPDES discharge permit.

Groundwater from Multiple-Well Pumping Tests Treatment

The multiple-well pumping tests are described conceptually in the *Data Collection in support of a Groundwater Interception IRM Design* letter submitted on August 28, 2017 and approved by NYSDEC on September 8, 2017.

Two or three pumping tests will be performed to assess the variability in aquifer properties in the unconsolidated deposits, to assess the hydraulic connection between the unconsolidated deposits and bedrock, and to provide information for designing the groundwater interception IRM using a groundwater flow model. Pumping wells will be installed near existing monitoring wells MW-04 and MW-19 (Figure 1).

During the pumping tests, all groundwater will be pumped directly from PW-19, PW-04, and MW-19 through the same mobile water treatment system used for the water treatment demonstration test. Depending on the anticipated flow, two additional GAC vessels in a lead-lag configuration may be added to increase treatment capacity. Treated water samples will be collected once per day during discharge and intermittently between the lead and lag vessels. Additional sampling will be completed, if needed, based on any requirements in the SPDES discharge permit.

Water Treatment Residuals Management

At the completion of the multiple-well pumping tests, a spent carbon sample will be collected from the GAC vessels and sent to Calgon for carbon acceptance testing and approval for reactivation. Carbon acceptance testing will include any necessary waste characterization and profile sampling needs relative to the final fate of spent carbon from the GAC system. Upon completion of the carbon acceptance testing and characterization, retrieval and return of the GAC will be coordinated with Calgon. Incineration of the GAC will be completed for complete destruction of PFAS compounds. Spent activated carbon containing adsorbed species can be thermally reactivated, destroying the adsorbed contaminants and allowing the activated carbon to be recycled and reused.

Solids and sediment that has accumulated within frac tanks on site will be dewatered as much as possible prior to transfer to a covered, roll-off dumpster stored onsite that

C.T. MALE ASSOCIATES

November 7 2017

Mr. James Moras, P.E.

Page - 5

contains other solid IDW (e.g., soil cuttings from drilling). The final disposal of solid IDW is to be determined.

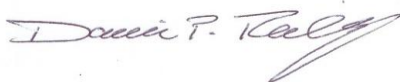
Summary

SGPP will consult with NYSDEC prior to treating any additional pumping test groundwater outside of the scope described in this letter and the *Data Collection in support of a Groundwater Interception IRM Design* letter.

Once the Department has reviewed this plan, we would be pleased to schedule and attend a meeting to further discuss the plan and address any questions or comments you may have. If you have any questions in the meantime, please feel free to contact me at your convenience.

Respectfully submitted,

C.T. MALE ASSOCIATES



Daniel P. Reilly, P.E.

Division Manager, Environmental Services

Attachment: Table 1: IRM Investigative Work Water Treatment Approach Summary
Table 2: IDW and Pumping Well Development Water Sampling and Analysis Plan
Figure 1: General Site Plan
Figure 2: Process Flow Schematics

c: Edward Canning, SGPP
Christopher Angier, P.E., SPGG
Christopher R. Gibson, Esq. Archer & Greiner
Susan Edwards, NYSDEC
Krista Anders, Ph.D. NYSDOH
Dolores A. Tuohy, Esq., NYSDEC
William Shaw, NYSDEC
Ray Wuolo, P.G, P.E., BARR Engineering
Sara J. Ramsden, P.E., BARR Engineering

C.T. MALE ASSOCIATES

November 7 2017

Mr. James Moras, P.E.

Page - 6

John McAuliffe, Honeywell Corp.
Kirk Moline, C.T. Male

Table 1

SGPP McCaffrey Site - IRM Investigative Work Water Treatment Approach Summary

Source water description	Source	Anticipated volume of water requiring treatment (gallons)	Batch/Continuous Treatment ^[1]	Treated water to be stored prior to discharge for PFAS concentration verification (Yes/No)	Discharge location requested for approval	Approximate treatment schedule	Water treatment process description	Proposed Sampling ^[2]	Additional Details
Investigative-derived waste (IDW)	New monitoring wells, recovery well, and pumping wells installation and development, new and existing monitoring wells purging, drilling tool and testing equipment decontamination water, accelerated column test (ACT) residuals	17,000	Batch	No	SD001 (overland flow to Hoosic River)	October 2017	Use same water treatment skid assembled for water treatment demonstration test and multiple-well pumping tests.	<ul style="list-style-type: none">• Source batch composite (full suite, Table 2)• Treated effluent (once/day)• Between lead/lag vessels (once/day)	Anticipated two, 8,500 gallon frac tanks of IDW.
Water treatment demonstration test extracted groundwater	PW-04/PW-19 (pumping wells)	25,000	Batch	Partially	SD001 (overland flow to Hoosic River)	November 2017	<ul style="list-style-type: none">• Pre-filter skid (Dual Gradient 50 -5 micron) or other pre-treatment device to be determined after suspended solids analysis	<ul style="list-style-type: none">• Source batch composite (full suite, Table 2)• Treated batch composite• Between lead/lag vessels (once/day)	Anticipated one, full 21,000 gallon frac tank and one additional, partially-full 21,000 gallon frac tank of groundwater from PW-04/PW-19. The demonstration test will include treatment of approximately 8,500 gallons of PW-04/PW-19 development water, and the remaining treated, development water is proposed for discharge to SD001.
Multiple-well pumping tests extracted groundwater: PW-04	PW-04 (pumping well)	240,000 ^[3]	Continuous	No	SD001 (overland flow to Hoosic River)	November 2017	<ul style="list-style-type: none">• Lead GAC vessel (Calgon CYCLESORB FP2, filled with up to 2,000 lbs of Calgon F400 GAC)	<ul style="list-style-type: none">• Treated effluent (once/day)• Between lead/lag vessels (once/day)	8 hour step drawdown test, 72 hour constant-rate pumping test, anticipated 50 gpm.
Multiple-well pumping tests extracted groundwater: PW-19	PW-19 (pumping well)	240,000 ^[3]				November 2017	<ul style="list-style-type: none">• Lag GAC vessel (Calgon CYCLESORB FP2, filled with up to 2,000 lbs of Calgon F400 GAC)		8 hour step drawdown test, 72 hour constant-rate pumping test, anticipated 50 gpm.
Multiple-well pumping tests extracted groundwater: MW-19	MW-19 (existing monitoring well)	7,200				November 2017	<ul style="list-style-type: none">• Influent, Midpoint, and Effluent Water Sampling Ports		24 hour constant-rate pumping test, anticipated 5 gpm.

Notes:

[1] Batch treatment process refers to extracted water being stored in a frac tank prior to treatment, and continuous treatment process refers to water being treated as it is generated/extracted.

[2] Proposed/conceptual sampling frequencies shown. Additional sampling will be completed based on requirements in the SPDES discharge permit. Treated effluent sampling will consist of per- and polyfluoroalkyl substances (PFAS), volatile organic carbons (VOCs), total organic carbon (TOC), and major cations and anions analysis. Between lead/lag vessel sampling will consist of PFAS and TOC analysis. See Table 2 for source batch composite sampling analytes.

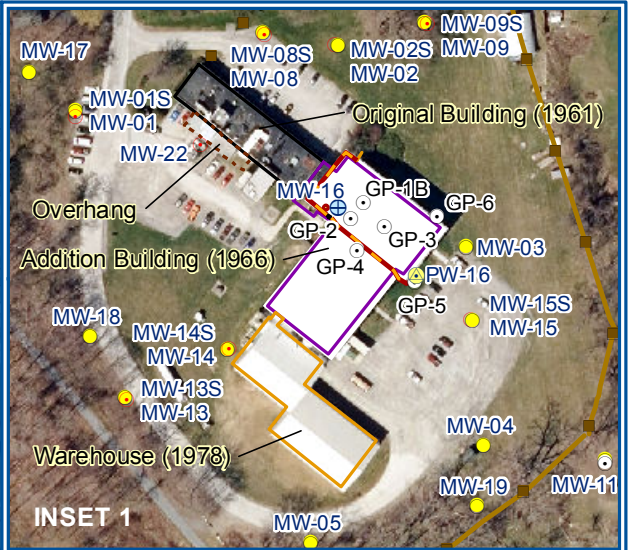
[3] Approximately 50 gallons per minute over 80-hour (total) pumping test. Total pumping volume anticipated over 80-hour test shown (approximately 72,00 gallons per 24-hour day).

Table 2

SGPP McCaffrey Site - IDW and Pumping Well Development Water Sampling and Analysis Plan

Full Suite Analyte List ¹
Alkalinity
Ammonia-N
Bicarbonate
Calcium
Carbonate
Chloride
Conductivity
Cyanide
Iron
Magnesium
Manganese
Metals ²
Pesticides ³
pH
Polychlorinated Biphenyls (PCBs) ³
Potassium
Semi-Volatile Organic Compounds (SVOCs) ³
Sodium
Sulfate
Temperature
Total Hardness
Total Organic Carbon (TOC)
Total Dissolved Solids (TDS)
Total Suspended Solids (TSS)
Turbidity
Volatile Organic Compounds (VOCs) ³
Perfluorooctanesulfonic acid (PFOS)
Perfluoroundecanoic Acid (PFUnA)
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)
Perfluoropentanoic Acid (PFPeA)
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)
Perfluorohexanoic acid (PFHxA)
Perfluorododecanoic acid (PFDoA)
Perfluorooctanoic acid (PFOA)
Perfluorodecanoic acid (PFDA)
Perfluorohexanesulfonic acid (PFHxS)
Perfluorobutanoic Acid (PFBA)
Perfluorobutanesulfonic acid (PFBS)
Perfluoroheptanoic acid (PFHpA)
Perfluorononanoic acid (PFNA)
Perfluorotetradecanoic acid (PFTA)
Perfluorotridecanoic Acid (PFTriA)
Perfluorooctane sulfonamide (PFOSA)
[1] Water quality data to be collected for investigative-derived wastes stored in frac tanks at the site prior to water treatment.
[2] Target Analyte List (TAL) of metals, including mercury.
[3] Target Compound List (TCL).

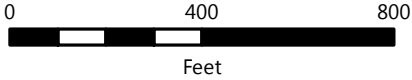
Barr Footer: ArcGIS 10.4.1, 2017-10-09 09:41 File: I:\Client\Saint Gobain\Hoosick Falls NY Maps\Reports\2017\SPDES Permitting\Figure 1 General Site Plan - SPDES Permit Discussions.mxd User: bal



Aerial Imagery: State of New York 2014

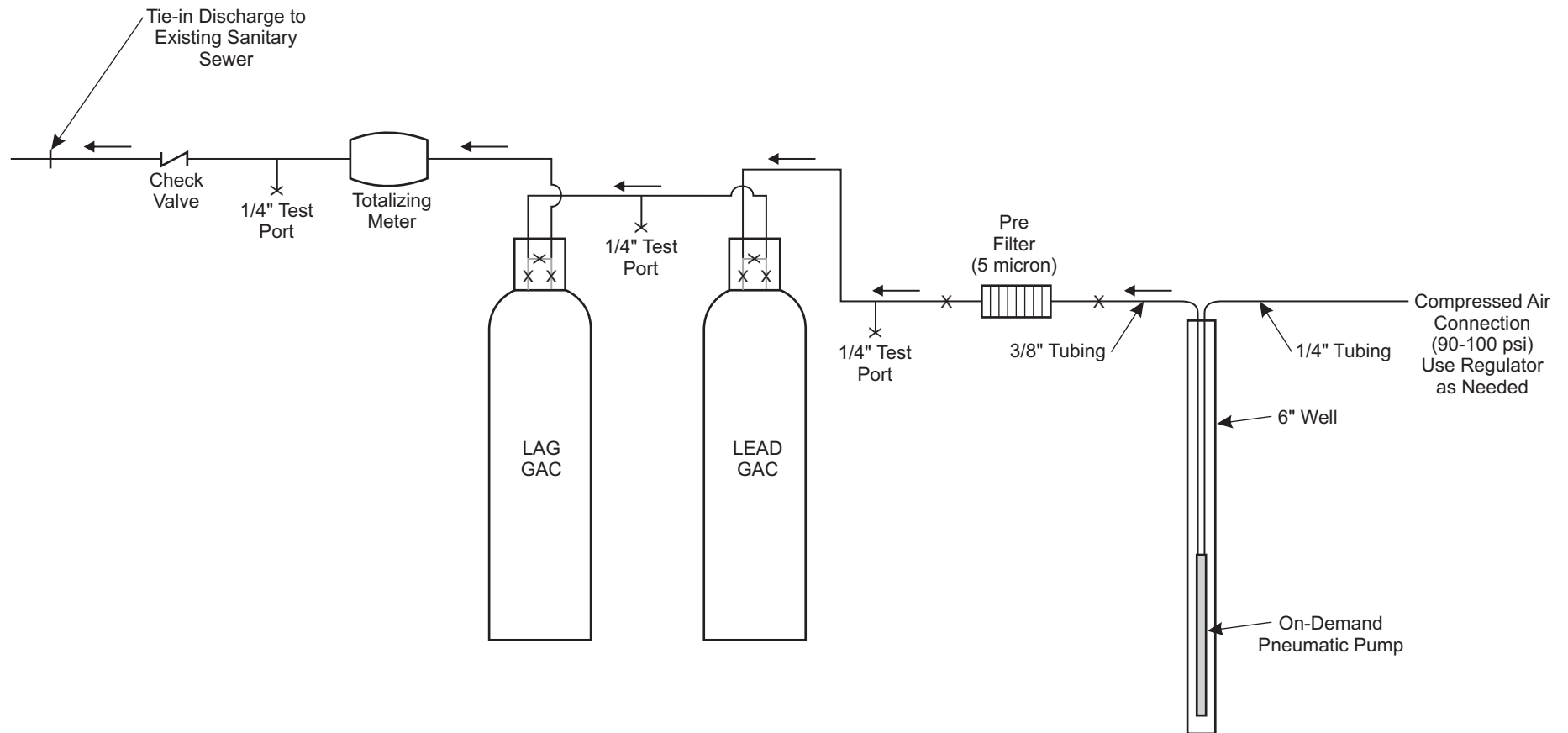
- Investigation Boring Location
 - Proposed Recovery Well
 - ▼ Proposed Pumping Well
 - 📍 Proposed SD001 Outfall Location
- Proposed Investigation Locations**
- ⦿ 2 Inch Monitoring Well Cluster
 - Temp Geoprobe Shallow/Deep MW Location
 - Shallow Geoprobe Location
 - ▲ Staff Gauge
- Existing Monitoring Locations**
- Shallow Monitoring Well
 - Deep Monitoring Well
 - ⊕ Village of Hoosick Falls Well
 - Municipal Sewer Overflow Pipe
 - Shallow Groundwater Contour (feet)
 - Deep Groundwater Contour (feet)
 - 10 ft Elevation Contour
 - ▭ Saint Gobain Property Boundary
 - ▭ Boundary of Adjacent Parcels

DRAFT



GENERAL SITE PLAN
SPDES PERMIT DISCUSSION
Saint-Gobain
Hoosick Falls, NY

FIGURE 1



- NOTES:
1. All connecting piping to be 3/4" PEX.
 2. Support piping and equipment as necessary.

Figure 2
PROCESS FLOW SCHEMATIC
MW-16 AREA REMEDIATION SYSTEM
Saint-Goban
Hoosick Falls, NY