NEW YORK STATE OF OPPORTUNITY. | Department of Environmental Conservation

PROPOSED STATEMENT OF BASIS

Former Hampshire Chemical Corp. Facility
Operable Units 01, 01B, 01C, and 01D

Site No. 850001A
EPA ID No. NYD002234763
Waterloo, Seneca County

September 2021

PREPARED BY
DIVISION OF ENVIRONMENTAL REMEDIATION

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SECTION 1: INTRODUCTION

The New York State Department of Environmental Conservation (Department) has determined that hazardous wastes and/or hazardous constituents were released into the environment at the facility. The Department, in consultation with the New York State Department of Health (NYSDOH), is proposing final corrective measures for the aforementioned facility. The proposed corrective measure(s) is/are intended to attain the cleanup objectives identified for this facility for the protection of public health and the environment. This Statement of Basis (SB) identifies the proposed corrective measure(s), summarizes the other alternatives considered, explains the reasons for selecting the proposed remedy, and solicits public involvement in the selection of corrective measure(s). The Department will select final corrective measure(s) only after the public comment period has ended and the information submitted during this time is reviewed and considered in the decision-making process.

The purpose of this SB is to provide an opportunity for the public to be informed of and to participate in the development of the remedial program for the facility. Public input on all potential remedial alternatives, and on the information that supports the alternatives, is an important contribution to the corrective measure selection process. The Department may modify the proposed remedy or select another remedy based on new information and/or public comments. The Statement of Basis summarizes and highlights key information from the RCRA Facility Investigation (RFI) and the Corrective Measures Study (CMS) reports but is not a substitute for these documents. The RFI and CMS reports and the administrative record are more complete sources of information regarding the corrective measure(s).

SECTION 2: CITIZEN PARTICIPATION

The Department encourages the public to review and comment on all of the corrective measure alternatives described in this document and on any additional options not previously identified and/or studied. Public input on all potential remedial alternatives, and on the information that supports the alternatives, is an important contribution to the corrective measure selection process. The Department may modify the proposed remedy or select another remedy based on new information and/or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. The Department will address all comments received during the public comment period in the Response to Comments document (RTC). The preferred remedy in the Statement of Basis is a preliminary determination. Should another option be selected as the remedy based upon public comment, new information, or a re-evaluation of existing information, any significant differences from this Statement of Basis will be explained in the

RTC. The Response to Comments will be sent to each person who submits written comments and/or who requests such notice.

A public comment period has been set from:

September 22, 2021 to November 8, 2021

In lieu of, or in addition to the submission of written comments, any interested person may request a public hearing. Any request for a public hearing must be in writing and must state the nature of the issues proposed to be raised in the hearing.

All comments on the proposed site remedy must be submitted no later than **November 8, 2021,** to**:**

Gail A. Dieter
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway – 12th Floor
Albany, NY 12233-7017
Telephone: (518) 402-9814
Email: gail.dieter@dec.ny.gov

Document Availability

This document summarizes information that can be found in greater detail in the administrative record for the facility. The administrative record contains many reports, including investigations and sampling results which the Department used to select the proposed final corrective measures. A list of all reports is referenced in Appendix A of this Statement of Basis (SB) and the referenced reports are available for review. The public is encouraged to review these documents, which are available at the following repositories:

Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway – 12th Floor
Albany, NY 12233-7017
Contact Person: Gail A. Dieter
Telephone: (518) 402-9814

Department of Environmental Conservation
Region 8 Office
6274 E. Avon-Lima Road
Avon, NY 14414-9519
Contact Person: David Pratt
Telephone: (585) 226-5449

Location at Waterloo, NY:

Waterloo Public Library
31 E. William Street
Waterloo, NY 13165
Telephone: (315) 539-3313

Key project documents and project summary also are available on the NYSDEC website at:
https://www.dec.ny.gov/data/DecDocs/850001A/

Receive Site Citizen Participation Information by Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html.

SECTION 3: FACILITY BACKGROUND

Site Description and History

Location: The facility is located at 228 East Main Street, Waterloo, New York, which is in the north-central portion of Seneca County, New York. The site is bordered to the north by East Main Street, to the east by Gorham Street, to the west by East Water Street, and to the south by the Cayuga-Seneca Canal. The site also includes a property currently owned by Evans Chemetics, on the eastern side of Gorham Street, which is used as a parking lot. The facility is surrounded by residential properties (north, east, and southwest) and commercial businesses (west).

Site Features: The facility consists of 11.11-acres of industrially developed land, including the fenced manufacturing facility and the Gorham Street parking lot. It contains interconnected buildings used as offices; a quality control laboratory; manufacturing, maintenance, and shipping/receiving operations; and a wastewater treatment plant (WWTP). The facility also has outside drum storage areas and several aboveground storage tanks. An undeveloped open area containing a former dump is located near its southwestern boundary.

Adjacent to the site is the Cayuga-Seneca Canal, a New York State Class “C” stream that supports fisheries and is suitable for non-contact activities. The canal is used primarily for pleasure craft and has a series of locks that maintain pool elevations between the locks and within Seneca and Cayuga Lakes. The pool elevation at the site is approximately 429-feet above mean sea level. The canal ranges from approximately 130 to 150-feet wide and has water depths in the center channel between 14 and 16-feet deep. The canal consists primarily of a bedrock/cobble substrate, but near the facility, the shoreline has been modified with riprap and other types of fill material.

Current Zoning and Land Use(s): This site is currently zoned for industrial use. The primary chemicals manufactured at the facility are thioglycolic (T-acid), thiodipropionate esters, and mercaptopropionic acid (MPA), divalent organic sulfur intermediates used for cosmetic, pharmaceutical, and plastics industries.

This site is surrounded by residential properties (north, east, and southwest), commercial businesses (to the west), and the Cayuga-Seneca Canal (to the south). South of the canal are some residences, warehouses, and further downstream is the village wastewater treatment plant. Bruno Bock – Evans Chemetics also owns a vacant lot on the northern side of East Main Street and a property on the eastern side of Gorham Street that is used as a parking lot.

Past Use of Site:

The facility was first owned and operated by the Waterloo Woolen Manufacturing Company, which operated a woolen textile mill from before 1839 until approximately 1936, when the mill was closed. Evans Chemetics reopened the facility in 1943 and produced divalent organic sulfur chemical intermediates, which are still manufactured there. W.R Grace Company acquired the facility in 1979, which remained a part of Grace's Organic Chemical Division until 1992, when Hampshire Chemical Corporation (HCC) completed a management buyout of the Organic Chemical Division. Evans Chemetics was part of the management buyout, and the facility became an operating unit of HCC.

In 1995, while HCC owned the facility, HCC was purchased by and became a wholly owned subsidiary of Sentrachem, Ltd., a South African chemical company. In 1997, Sentrachem was acquired as a wholly owned subsidiary of The Dow Chemical Company (Dow). In 2005, Dow sold the facility (as well as other assets of Evans Chemetics) to Bruno Bock, a German manufacturing company. Evans Chemetics LP is now a wholly owned subsidiary of Bruno Bock and operates the facility.

The facility has been the subject of several site investigations and as a result a total of 46 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) have been identified. The Department has determined that no further action is necessary for many of these SWMUs and AOCs, as documented in Attachment 3 – Table 1 of the Second Amended Order on Consent (Index No. 8-20000218-3281). A description of each historical SWMU and AOC can be found in Exhibit A, along with the final status of the corrective measure chosen. See Table 1.1 in Exhibit A.

Operable Units: The site was divided into six operable units. See Figure 1.2. An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination.

Operable Unit 1 (OU1): Evans Chemetics Division of Hampshire Chemical represents the entire facility, located at 228 East Main St., Waterloo, NY. The site has been subject to several site investigations and separated into areas of concern (AOCs) and solid waste management units (SWMUs) – 46 in total. No Further Action (NFA) determinations have been issued for many of the SWMUs and AOCs during the initial investigation (see Table 1.1). Five AOCs/SWMUs required additional investigation and/or remediation. AOC-E (Monitoring Well MW-10 Area), AOC F (Facility Outfalls), SWMU 7 (Hazardous Waste Container Storage Area), SWMU 8 (Former Nonhazardous Waste Container Storage Area), SWMU 25B (MPA Residue Hoppers), vapor intrusion monitoring, and site-wide groundwater monitoring have been included in the site-wide Operable Unit 1.

Operable Unit 1B (OU1B) – AOC C (Gorham Street): This OU is located outside the facility boundary and includes some area within the street right-of-way. OU1B is defined as two areas, one larger area east of Gorham Street and one smaller area west of Gorham Street. The portion east of Gorham Street is approximately 1.8 acres of land that extends approximately 365 feet east of Gorham Street and terminates at the adjacent residential parcel. The area extends from the northern property boundary to the Cayuga-Seneca Canal located to the south. The New York State Canal Corporation (NYSCC) owns a thin right-of-way extending along the canal. A thin right-of-way also extends along each edge of Gorham Street and is owned by the Village of Waterloo.

Operable Unit 1C (OU1C) – AOC B (Building 4): Building 4 was designated an AOC because of a former open pit in the building which had elevated PCBs prior to it being filled. It is located upgradient and north of the Cayuga-Seneca Canal. When the pit was in use barrels were placed in the pit and chemicals

were transferred into the barrels. Process tanks also were located within the pit. The western portion of the pit contained a sump that served as the collection point for the floor drains in the building and for spills within the pit. Before 1975, the sump drained to the canal.

Operable Unit 1D (OU1D) - AOC D (MW-11S): OU1D is an area consisting of monitoring wells (MW) MW-11S, MW-11I, MW-21, and MW-24, which are south of Building 3.

Operable Unit 2 (OU2) – AOC A (Cayuga-Seneca Canal): OU2 consists of a man-made canal adjacent to the site, where there are four major soft sediment deposition areas – North Shore, South Shore, Gorham Street Bridge Area, and a Downstream Deposit. PAHs, PCBs, and metals were detected in the sediments above the NYSDEC screening values. In March 2014, a Statement of Basis was issued for a remedy involving the removal of 4,500 to 7,200-cubic yards of soft sediment from three of the remedial target areas – North Shore Deposit, Gorham Street Deposit, and Downstream Deposit, by mechanical dredging. The removal was initiated in the Fall of 2014 and was completed in the Summer of 2015.

Operable Unit 3 (OU3) – SWMU 1 (former Village of Waterloo Landfill): OU3 is a closed landfill which received municipal waste from the Village of Waterloo until the early 1950's. Maps of the facility show the landfill to be approximately 300-feet by 400-feet, encompassing land presently owned by Evans Chemetics, NYS Canal Corp, and Hampshire Chemical. The former landfill is in the southwest section of the Evans Chemetics facility. In March 2015, a Statement of Basis (SB) was issued for a remedy consisting of a cover system of asphalt and a soil cap of 2-feet of compacted soil with a 6-inch topsoil layer; institutional control of an environmental easement; and a site management plan. It was later determined that the installation of a geosynthetic clay liner (GCL) would replace the use of 2-feet of compacted soil. Corrective measure action was started in the Fall of 2016, and was completed in the Spring of 2017, when the 6-inches of topsoil received a seeded cover.

This Statement of Basis addresses four of the operable units, including OU1, OU1B, OU1C, and OU1D. As noted above, a Statement of Basis was previously issued for OU2 and for OU3.

Site Geology and Hydrogeology: The site slopes gently southward toward the canal with elevations ranging from 457 to 429-feet above mean sea level (amsl) at the canal bank, and 415-feet amsl at the bottom of the canal. South of the facility, the canal consists of steep rocky sides, with a relatively flat bottom consisting largely of sand and rock. Riprap material also is present at some areas of the canal bank and bottom. The uplands portion of the site is underlain by historic fill. Beneath the historic fill, three distinct natural hydrogeologic units are present – soft native deposits (silt and clay), glacial till (very hard silts and clay), and bedrock (Onondaga Limestone). Fill was placed over the native deposits across most of the site to depths of at least three feet below ground surface (bgs), with thicker levels near the canal bank. The fill material generally consists of silt, sand, and gravel with varying amounts of brick fragments, cinder, coal pieces, ash, and wood pieces. The fill appears to have been placed in the area before operations were started in the 1800s, as the fill also has been identified under the building foundations.

The facility is within the watershed of the Seneca River, which is an easterly flowing New York State Class 'C' stream. A New York State Class 'C' stream supports fisheries and is suitable for non-contact activities. Sitewide groundwater measurements indicate groundwater flow is generally to the south toward the canal. Groundwater depths for on-site wells generally vary between 2 and 8-feet below ground surface (bgs).

A site location map is attached as Figure 1.1 and a facility map is attached as Figure 1.2.

SECTION 4: ENFORCEMENT STATUS

6NYCRR Part 373 Hazardous Waste Management Permits include RCRA Corrective Action. This requires owners and/or operators of hazardous waste treatment, storage and disposal facilities to investigate and, when appropriate, remediate releases of hazardous wastes and/or constituents to the environment. The former Hampshire Chemical Corp (HCC) is a wholly owned subsidiary of the Dow Chemical Company (Dow). HCC has retained environmental liabilities for the facility in accordance with the terms described in the purchase agreement between HCC and Bruno Bock, the current property owner.

Resource Conservation and Recovery Act facility investigations (RFIs) have been performed at the facility since 1993 to evaluate the nature and extent of releases to the environment. An Order on Consent (Index Number 8-20000218-3281) has been executed between HCC and NYSDEC for the facility, and amended as follows:

- January 30, 2002 – An Order on Consent to implement an RCRA sampling visit work plan at the facility
- June 1, 2004 – An Amended Order on Consent to develop and implement an RFI work plan
- August 12, 2011 – A Second Amended Order on Consent (SAOC) to continue RFIs as well as implement and complete corrective actions at the facility.

All remedial actions described in this SB will be performed under the authority of the Order.

SECTION 5: RCRA FACILITY INVESTIGATION (RFI)

The RCRA Corrective Action process began with investigations to evaluate potential areas of the facility that may have been impacted by hazardous wastes and/or hazardous constituents. Based on the results of investigations, the Department has determined that hazardous wastes and/or hazardous constituents have been released at the facility. The impact of releases of hazardous wastes and/or hazardous constituents at the facility were characterized and evaluated.

The analytical data collected for the facility includes data for:

Target Compound List (TCL) volatile organic compounds (VOCs)
TCL semivolatile organic compounds (SVOCs)
Polychlorinated Biphenyls (PCBs)
Target Analyte List (TAL) Metals
Sulfate
Nitrate
Methane
Carbon Dioxide
Alkalinity
Total phosphorous
Total organic carbon

The data have identified contaminants of concern. A "contaminant of concern" is a hazardous waste that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Based on the results, the Department determined that corrective measures were required to address some of the areas investigated. The RCRA Facility Investigation (RFI) Report contains a full discussion of the data. The nature and extent of contamination and environmental media requiring action are summarized in **Exhibit A**.

The contaminant(s) of concern for the subject operable units (i.e. OU1, OU1B, OU1C, OU1D) is/are:

Volatile Organic Compounds – acetone and methyl isobutyl ketone (MIBK)
Total polychlorinated biphenyls (PCBs)
Total polycyclic aromatic hydrocarbons (PAHs)
Metals – arsenic, cadmium, chromium, copper, lead, mercury and zinc
Hydrogen sulfide
Methane
Alkaline pH

As illustrated in Exhibit A, the contaminant(s) of concern exceed the cleanup objectives for:

Soil Criteria

NYSDEC Industrial soil cleanup objectives (SCOs): Protection of Public Health (6 NYCRR Part 375-6.8(b)) – used within fenced boundaries of facility
NYSDEC Residential SCOs: Protection of Public Health (6 NYCRR Part 375-6.8(b)) – used for Gorham Street area where there are bordering residential properties
Supplemental Soil Cleanup Objectives for Industrial or Residential as appropriate, as presented in Table 1 of Commissioner's Policy (CP)-51, NYSDEC Soil Cleanup Guidance (October 21, 2010)
TAGM 4046 Recommended Soil Cleanup Objectives for MIBK (NYSDEC, January 1994, modified July 2001)

*Historical soil data at the site were screened against the screening criteria available at the time (NYSDEC TAGM 4046). In 2010, NYSDEC issued the CP-51 Soil Cleanup Guidance, which applies to each of the remedial programs administered by the Division of Environmental Remediation to replace the TAGM 4046: Determination of SCOs and Cleanup Levels, dated January 1994. This included the restricted use SCO for protection of public health and supplemental SCOs for industrial and residential use. The industrial values were used as soil screening levels for the areas that are within fenced boundaries of the facility, whereas the residential values were used as soil screening levels for the areas adjacent to AOC C because of the bordering residential properties. NYSDEC requested that for soil compounds that do not have a remedial program SCO as defined in NYCRR Part 375-6.8, values should be used from the SSCOs of the Soil Cleanup Guidance and from TAGM 4046 for MIBK.

Groundwater Criteria

TOGS 1.1.1, NYS Groundwater Effluent Limitations (Class GA), June 1998, as amended (NYSDEC 1998, modified 2004).

Air (Vapor Intrusion) Criteria

NYS Department of Health Guidance for Soil Vapor Intrusion in the State of New York (2006)

Methane Criteria

Title 6, NYCRR Section 360-2.17(f)

5.1: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The RFI report presents a more detailed discussion of any existing and potential impacts from the site.

Based upon investigations conducted, the primary contaminants of concern are/were –

OU1-Facility-Wide including:

Facility-wide Groundwater
Facility-wide Soil Vapor/Indoor Air
AOC E (Monitoring Well MW-10 Area)
SWMU 7 (Hazardous Waste Container Storage Area)
SWMU 8 (Nonhazardous Waste Container Storage Area)
SWMU 25B (MPA Residue Hopper)

Soil – Chloroform, 4-methyl-2-pentanone (MIBK), PAHs - benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and metals – arsenic, mercury have been detected in soils related to OU1 AOCs and SWMUs above the industrial SCOs (IUSCOs) at concentrations of 2.9 parts per million (ppm) (IUSCO of 0.3ppm), 24.6ppm (IUSCO of 1ppm), 112ppm (IUSCO of 11ppm), 106ppm (IUSCO of 1.1ppm), 94.5ppm (IUSCO of 11ppm), 11.5ppm (IUSCO of 1.1ppm), 34.1ppm (IUSCO of 11ppm), 36.7ppm (IUSCO of 16ppm) and 12.7ppm (IUSCO of 5.7ppm), respectively.

Groundwater – bis(2-ethylhexyl) phthalate has been identified in groundwater at a maximum concentration of 10.8 parts per billion (ppb) (ambient groundwater standard of 5 ppb).

Soil Vapor/Indoor Air – Chloroform, carbon tetrachloride, tetrachloroethene, trichloroethene, 1,1-dichloroethene, carbon disulfide, xylenes, and toluene have been detected in soil vapor at maximum concentrations of 440 micrograms per cubic meter (ug/m^3), 2.1 ug/m^3, 32 ug/m^3, 520 ug/m^3, 4.2 ug/m^3, 34 ug/m^3, 7.2 ug/m^3, and 36 ug/m^3, respectively. SVI and indoor air sampling concluded that no actions were necessary to address the vapor intrusion pathway at Buildings 1, 2, 2-A, 2-B, 3, and Tank Storage Area.

OU1B-Gorham Street (AOC C)

Soil – PCBs, arsenic, and cadmium have been detected in soils above the restricted residential soil cleanup objectives (RRSCOs) at concentrations of 11.8 ppm (RRSCO of 1.0 ppm) 228 ppm (RRSCO of 16 ppm) and 53.5 ppm (RRSCO of 2.5 ppm), respectively.

Groundwater – Impact has not been observed; AOC C/Gorham Street groundwater is not a media of concern.

OU1C-Building 4 (AOC B)

Soil – Investigations have identified soil impacts of MIBK and mercury, detected at maximum concentrations 8.1 ppm (IUSCO of 1 ppm), and 7.04 ppm (IUSCO of 5.7 ppm), respectively. Based on limited exceedances, soil is not a media of concern in this OU.

Groundwater – Methyl isobutyl ketone (MIBK), acetone, and chromium have been identified in groundwater at maximum concentrations of 1,610,000 ppb (ambient guidance value of 50 ppb), 2,640 ppb (ambient guidance value of 50 ppb), and 2,844 ppb (ambient standard of 50 ppb), respectively. An interim corrective measure of Monitored Natural Attenuation (MNA) was implemented in 2014. Decreasing trends have been documented since MNA was implemented. During the most recent reported sampling event in 2018, MIBK was detected at a maximum concentration of 1,200 ppb, acetone fell below Method Detection Limit (MDL), and chromium was detected at a maximum concentration of 219.9 ppb.

Soil Vapor – Hydrogen sulfide and methane have been identified in the sub-slab soil vapor at maximum concentrations of 180,000,000 ug/m^3 and 31.4 percent by volume (Vol%), respectively. Installation of a Sub-Slab Depressurization System (SSDS) was completed in the Spring of 2020. The overall VI risk for Building 4 is reduced because the low permeability soils limit the volume of soil gas that can be drawn into the building by natural forces. This coupled with the high natural air exchange rates documented in previous studies (Jacobs, 2019) reduces the level of concern associated with these strongly anaerobic gases. This is further supported by the continued long-term operation of hydrogen sulfide and LEL monitors within Building 4 by Evans Chemetics to ensure worker safety.

OU1D-Monitoring Wells MW-11S and MW-21 (AOC D)

Soil – Investigations have identified limited soil impacts of arsenic detected at a maximum level of 8.5 ppm (IUSCO of 16 ppm). Based on these investigations, soil is not a media of concern.

Groundwater – Arsenic along with an alkaline pH, have been identified in the two monitoring wells. Arsenic has been detected in groundwater at a maximum concentration of 24,000 ppb (ambient standard of 25 ppb) with a maximum pH-12 detected. An interim corrective measure of MNA was implemented in 2014. Stable to decreasing trends have been measured since MNA was implemented. During the most recent reported sampling event in 2018, arsenic was detected at a maximum concentration of 2,418 ppb with pH still exceeding 8.5, but not exceeding its historical maximum.

5.2: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure.*

People are not drinking contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. People will not come into contact with site-related soil and groundwater contamination unless they dig below the ground surface.

Volatile organic compounds in the groundwater may move into the soil vapor (air between soil particles), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. A sub-slab depressurization and vapor mitigation system (system that ventilates/removes the air beneath the building) has been installed in the on-site building to prevent soil vapor intrusion.

5.3 Summary of the Remediation Objectives

The objectives for the corrective measures have been established through the remedy selection process. The goal of the corrective measures is to protect public health and the environment and achieve unrestricted use of the site to the extent feasible.

The remedial action objectives for this site are:

Groundwater
- Human Health
  - Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
  - Prevent direct contact with, or inhalation of volatiles, from contaminated groundwater.
- Environment
  - Prevent the discharge of contaminants to surface water.
  - Remove the source of ground or surface water contamination.

Soil
- Human Health
  - Prevent the ingestion and/or direct contact with contaminated soil.
  - Prevent the inhalation of, or exposure from contaminants, volatilizing from contaminants in soil.
- Environment
  - Prevent migration of contaminants that would result in groundwater or surface water contamination.
  - Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

Soil Vapor
- Human Health
  - Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a facility.

SECTION 6: INTERIM CORRECTIVE MEASURES

If at any time during an investigation, it becomes apparent that corrective actions should be taken to immediately address the spread of contamination, interim corrective measures must be taken. The design emphasis is to construct an Interim Corrective Measure (ICM) as close to a permanent system or final remedy as possible. The Department has determined that the ICMs are protective to human health and the environment and could serve as part of the Final Corrective Measures at the facility.

The following ICMs have been completed at the facility based on conditions observed during the RFI.

OU1B-Gorham Street (AOC C) – In October 2013 an ICM was initiated on the parking lot side of AOC C. The ICM consisted of containment using the existing asphalt parking lot as a cap and:

- extending the asphalt cap;
- constructing a soil cover over the remaining area of lower-level impacted soil around the larger sized parking lot;
- removing shallow soil from the adjacent residential area near location DE-33;
- bank grading and restoration; and monitoring.

Within an area west of Gorham Street, placement of a cover was not implementable because of extreme slope, so the existing site security fence was extended to include that area.

The objectives were to eliminate direct contact to impacted media; windborne transport; and eliminate potential runoff to adjacent receptors such as the canal or adjacent residential properties. As documented in Gorham Street Corrective Measures, Construction Completion Report – November 2014.

OU1C-Building 4 (AOC B) – In April 2015, an ICM was approved for monitoring and evaluating the natural degradation of MIBK and chromium in groundwater over time. Groundwater has been monitored for site-related contamination and degradation parameters for a period of 5 years. The data indicates that MIBK and chromium concentrations have declined, and long-term monitoring should continue. AOC B is paved with asphalt and concrete which protects the public and environment because there is no direct contact with the underlying soils and limits infiltration of surface water which may cause leaching of contaminants from the soil. Monitoring was initiated in 2014 and continues to date.

Elevated concentrations of methane and hydrogen sulfide exist beneath the Building 4 floor slab. An SSDS was constructed and SSDS testing was completed and documented in the Construction Completion Report.

OU1-Former Nonhazardous Waste Container Storage Area (SWMU 8) – The nonhazardous waste container storage area is an outdoor area that was built in 1975 in the northwestern portion of the facility within SWMU 1. It was used for temporary storage of 55-gallon plastic drums of nonhazardous still-bottom wastes, which originated from the various facility processes. Initially the area was unpaved, with an earthen dike on three sides (open to the east). A concrete pad with concrete dikes was constructed in the area and was open to the north. The eastern third of the concrete pad was removed during WWTP construction. The existing SWMU 8 ground cover is paved with concrete, and the area is still used for storing nonhazardous wastes in plastic totes. No releases have been reported from SWMU 8. In a September 2011 abbreviated CMS, institutional controls (ICs) were required for SWMU 8. The ICs will be established concurrently with the other facility SWMUs/AOCs that require ICs.

SECTION 7: CORRECTIVE MEASURES STUDY (CMS)

Potential final corrective action measures for the facility were identified, screened, and evaluated in the CMS report. To be selected, the proposed final corrective measures must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies, or resource recovery technologies to the maximum extent practicable. The final corrective action measures for the facility must address potential routes of exposure to humans and the environment and attain the cleanup objectives identified for the facility.

7.1: Evaluation of Corrective Measure Alternatives

A detailed discussion of the evaluation criteria and comparative analysis is included in the final CMS report.

The general performance standards for corrective measures that must be satisfied in order for an alternative to be considered for selection are listed below.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Achieve Cleanup Objectives for the Contaminated Media. – This criterion evaluates the ability of alternatives to achieve the cleanup objectives established for the facility.

3. Remediate the Sources of Releases. – This criterion evaluates the ability of the alternatives to reduce or eliminate to the maximum extent possible further releases.

4. Comply with Standards for Management of Wastes. – This criterion evaluates how alternatives assure that management of wastes during corrective measures is conducted in a protective manner.

The next five selection criteria are used to compare the positive and negative aspects of each of the remedial alternatives.

5. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.
6. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the facility.

7. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the cleanup objectives is also estimated and compared against the other alternatives.

8. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

9. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

SECTION 8: ELEMENTS OF THE PROPOSED CORRECTIVE MEASURE(S)

Based on the results of the investigations at the site, the ICMs that have been performed, the data collected, and the evaluation presented here, the Department is proposing No Further Action with Site Management and Institutional Controls as the remedy for OU1 (AOC E, SWMU 7, SWMU 8, SWMU 25B), OU1B (AOC C), OU1C (AOC B), and OU1D (AOC D). The Department believes that this remedy is protective of human health and the environment and satisfies the remediation objectives described in Section 5.3.

The elements of the ICMs already completed and the institutional and engineering controls are listed below:

1. Green remediation principles and techniques will be implemented to the extent feasible in the site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;

- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. Cover System

A site cover currently exists at OU1C (AOC B) and OU1B (AOC C) and will be maintained to allow for industrial use of the site. Any site re-development will maintain the existing site cover. The site cover may include paved surface parking areas, sidewalks or soil where the upper one foot of exposed surface soil meets the applicable soil clean-up objectives (SCOs) for industrial use. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6NYCRR part 375-6.7(d).

3. Vapor Mitigation

Building 4 is required to have a sub-slab depressurization system or other acceptable measures, to mitigate the migration of vapors into the building from groundwater. In Spring of 2020 the construction of an SSDS system was completed for AOC B (Building 4).

4. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

- Requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional controls in accordance with Part 375-1.8 (h)(3);
- Allow the use and development of the controlled property for industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- Restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- Requires compliance with the Department approved Site Management Plan.

5. A Site Management Plan is required, which includes the following:

a) An Institutional and Engineering Control Plan that identifies all use restrictions for the site and details the steps and media-specific requirements necessary to ensure the following institutional and engineering controls remain in place and effective:

<u>Institutional Controls</u>:

The Environmental Easement discussed above.

Engineering Controls:

The Cover System discussed above.

The subslab depressurization system discussed above.

This plan includes, but may not be limited to:

- An Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- Descriptions of the provisions of the environmental easement including groundwater use restrictions;
- A provision for the evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusions;
- Maintaining site access controls and Department notification; and
- The steps necessary for the periodic reviews and certification of the institutional and/or engineering controls

b) Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

    - Monitoring of on-site groundwater to assess the performance and effectiveness of the remedy;
    - Periodic SSDS pressure field testing to provide a better understanding of the spatial and temporal consistency of subslab saturated soils is needed to ensure reliable long-term operation of the SSDS;
    - A schedule of monitoring and frequency of submittals to the Department; and
    - Monitoring for vapor intrusion for any buildings developed on the site, as may be required by the Institutional Control Plan discussed above.

c) An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation system(s). The plan includes, but is not limited to:

    - Procedures for operating and maintaining the system(s); and
    - Compliance inspection of the system(s) to ensure proper O&M as well as providing the data for any necessary reporting.

Draft STATEMENT OF BASIS

Exhibit A

Former Hampshire Chemical Corp. Facility
Operable Units 01, 01B, 01C, and 01D
Waterloo, Seneca County
EPA No. NYD002234763 / Site No. 850001A

September 2021

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the RCRA Facility Investigation for all environmental media that were evaluated. As described in Section 5, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium, a table summarizes the findings of the investigation. The tables present the range of contamination found at the facility in the media and compares the data with the applicable SCGs for the facility. The contaminants are arranged into four categories: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs) and inorganics (metals). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs are also presented.

As part of the visual facility inspection performed between 1991 and 1992 and the subsequent RCRA facility assessment report, 46 SWMUs and AOCs were identified. Of the 46, 36 were recommended for no further action (NFA) based on use of the areas. See Table 1.1. Corrective Measures Implementation Plan of the Second Amended Order on Consent (SAOC), further investigation and corrective measures were required for:

- Facility-wide Groundwater Contamination
- Facility-wide Soil Vapor/Indoor Air (includes soil vapor beneath a building slab)
- Gorham Street
- AOC A – Cayuga-Seneca Canal Raceway
- AOC B – Building 4 Pit
- AOC C – Source Area for Polychlorinated Biphenyls (PCBs)
- AOC D – Monitoring Well MW-11S Area
- AOC E – Monitoring Well MW-10 Area
- AOC F – Facility Outfalls
- SWMU 1 – Former Village of Waterloo Dump Site
- SWMU 7 – Hazardous Waste Container Storage Area
- SWMU 8 – Nonhazardous Waste Container Storage Area
- SWMU 25B – MPA Residue Hopper

Several RFI work plans were submitted to NYSDEC for approval to perform facility investigations at the SWMUs and AOCs to understand the nature and extent of impacted media at the facility.

Table 1.1 SWMU(s)/AOC(s)

Area	Classification	Facility wide/AOC/SWMU	Description	Remedy Selection Document	Corrective Measure Status
Facility-wide issues	Facility-wide	Facility-wide	Facility-wide groundwater	2011 Second administrative Order on Consent	Long-term groundwater monitoring
AOCs	AOC	AOC A	Cayuga-Seneca Canal and Raceway	December 2013 Statement of Basis	Remediation Complete

AOCs	AOC	AOC B	Building 4 Pit	This Statement of Basis Document	Proposed remedy within this Statement of Basis Document
AOCs	AOC	AOC C	Gorham Street/Source Area for PCBs	This Statement of Basis Document	Proposed remedy within this Statement of Basis document
AOCs	AOC	AOC D	Monitoring Well MW11S Area	This Statement of Basis	Proposed remedy within this Statement of Basis
AOCs	AOC	AOC E	Monitoring Well MW10 Area	This Statement of Basis	Proposed remedy within this Statement of Basis
AOCs	AOC	AOC F	Facility Outfalls	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Land Disposal Areas - Landfill	SWMU 1	Former Village of Waterloo Dump Site	March 2015 Statement of Basis	Remediation Complete
SWMUs	Container Storage Areas	SWMU 2	R&D Laboratory hazardous Satellite Accumulation Area	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Container Storage Areas/Satellite Accumulation Areas	SWMU 3	QC laboratory Hazardous Satellite Accumulation Area	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Container Storage Areas/Satellite Accumulation Areas	SWMU 4	Carpentry Shop Hazardous Satellite Accumulation Area	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Container Storage Areas/Satellite Accumulation Areas	SWMU 5	Long-Term Storage Area	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Container Storage Areas/Satellite Accumulation Areas	SWMU 6	Former Building No.16 Drum Storage Area	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Container Storage Areas/Satellite Accumulation Areas	SWMU 7	Hazardous Waste Container Storage Area	This Statement of Basis	Proposed remedy within this Statement of Basis
SWMUs	Container Storage Areas/Satellite	SWMU 8	Nonhazardous waste Container Storage Area	This Statement of Basis	Proposed remedy within this Statement of Basis

	Accumulation Areas				
SWMUs	Container Storage Areas/Satellite Accumulation Areas	SWMU 9	Intermediate Nonhazardous Waste Container Storage Area	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Container Storage Areas/Satellite Accumulation Areas	SWMU 10	New Nonhazardous Waste Container Storage Area	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Air Pollution Equipment – Caustic Scrubber Units	SWMU 12	Department 70 Caustic Scrubber System	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Air Pollution Equipment – Caustic Scrubber Units	SWMU 13	Waste Treatment Plant Caustic Scrubber System	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Waste Storage Tanks – Day Tanks	SWMU 14	Spent Scrubber Solution Day Tank (3-HT-30)	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Waste Storage Tanks – Day Tanks	SWMU 15	Former Department 68 Day Tank (4-AV-7)	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Waste Storage Tanks – Day Tanks	SWMU 16	Department 68 Day Tank (4-AV-4)	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Waste Storage Tanks – Day Tanks	SWMU 17	Department 69 Day Tank (2-HT-26)	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Waste Storage Tanks – Day Tanks	SWMU 18	Former Department 70 Day Tank (2-HT-22)	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Waste Storage Tanks	SWMU 19	MFA Raffinate Tank (16-HT-47)	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Waste Storage Tanks	SWMU 20	Ammonium Bisulfate Tank (16-HT-126)	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Miscellaneous Units	SWMU 21	Outside SEM Tail Storage Tank	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report

SWMUs	Miscellaneous Units	SWMU 22	Former Building No. 14 Loading Area	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Miscellaneous Units	SWMU 23	Building No. 16 Loading Area	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Miscellaneous Units	SWMU 24	Safety-Kleen Unit	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Miscellaneous Units	SWMU 25	MPA Residue Hopper	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Miscellaneous Units	SWMU 25A	MPA Residue Hopper	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Miscellaneous Units	SWMU 25B	MPA Residue Hopper	This Statement of Basis	Proposed remedy within this Statement of Basis
SWMUs	Miscellaneous Units	SWMU 26	MPA Lower Acid Layer Tank	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Miscellaneous Units	SWMU 27	Aboveground Waste Transfer System	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Miscellaneous Units	SWMU 28	Wash Water Sewer System	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Miscellaneous Units	SWMU 29	SPDES Sewer System	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	WWTP – Phase I Waste Treatment System	SWMU 30	Acid Tank (16-HT-31)	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	WWTP – Phase I Waste Treatment System	SWMU 31	Alkali Tank (16-HT-32)	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	WWTP – Phase I Waste Treatment System	SWMU 32	Wash Water Holding Tank	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	WWTP – Phase I Waste Treatment System	SWMU 33	SEM Tailpipe Holding	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report

SWMUs	WWTP – Phase I Waste Treatment System	SWMU 34	East Neutralization Tank (16-HT-33)	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	WWTP – Phase I Waste Treatment System	SWMU 35	West Neutralization Tank (16-HT-34)	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	WWTP – Phase I Waste Treatment System	SWMU 36	West Neutralization Tank (16-HT-34) Sludge Holding Tank	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	WWTP – Phase I Waste Treatment System	SWMU 37	Passavant Plate-and-Frame Filter Press System	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	WWTP – Phase I Waste Treatment System	SWMU 38	Solid Waste Conveyor	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	WWTP – Phase I Waste Treatment System	SWMU 39	Filter Cake Storage Container	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	WWTP – Phase I Waste Treatment System	SWMU 40	Neutralized Slurry Filtrate Tank (16-HT-118)	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Phase II Waste Treatment System	SWMU 41	Polishing Plate and Frame Filter Press	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Phase II Waste Treatment System	SWMU 42	Phase II (Pre-GAC) Holding Tank	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Phase II Waste Treatment System	SWMU 43	GAC Reactor Vessels (16-AB-1)	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Phase II Waste Treatment System	SWMU 44	Post-GAC Holding Tank (16-HT-118)	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Phase II Waste Treatment System	SWMU 45	Spent Carbon Transfer Bin	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report
SWMUs	Equalization Tank	SWMU 46	Wastewater Equalization Tank	2011 Second Administrative Order on Consent	No Action based on results of RCRA Facility Investigation Report

SWMU(s)/AOC(s)

As described in the RFI report, SWMU(s)/AOC(s) were identified at the facility and are impacting groundwater, soil, and/or soil vapor.

A SWMU includes any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of hazardous or solid wastes. Such units include any area at the facility where solid wastes have been routinely and systematically released. An AOC is an area at the facility, or an off-site area, which is not at the time known to be a SWMU, where hazardous wastes and/or constituents are present or are suspected to be present as a result of a release from the facility. Solid wastes are defined in 6 NYCRR Part 371.1(c) and hazardous wastes are defined in 6 NYCRR Part 371.1(d).

The below AOC(s)/SWMU(s) are the subject of this document.

Facility-wide Groundwater Monitoring – Facility investigation activities included installing and regularly sampling monitoring wells. See Figure 1.3. These monitoring wells were intended to monitor groundwater quality in and around several of the SWMUs and AOCs and across the facility during the development of the conceptual site model (CSM) and investigation phases of work. The monitoring wells were sampled for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and target analyte list (TAL) metals.

Facility-wide Soil Vapor/Indoor Air – Vapor intrusion investigations were performed throughout the facility and included building surveys and collecting soil vapor, indoor air, and subslab vapor samples for VOCs. Sources of constituents potentially contributing to vapor intrusion are the VOCs detected in soil and groundwater under or near the buildings. The sampling program included all on-site buildings, including the administrative building (Building 13), the production buildings (Buildings 1, 2, 2-A, 2-B, 3, 4, and the Tank Storage Area), SWMU 1, and Gorham Street.

AOC B – Building 4 Pit – AOC B is known as the Building 4 Pit, which housed dye vats during the 1800s when the facility operated as a woolen textile mill. The former Building 4 Pit was located along the southern end of Building 4, extending from the western wall nearly the length of the building. The facility has been manufacturing divalent organic sulfur intermediates used for the cosmetic, pharmaceutical, and plastics industries from 1943 to present, and process tanks and chemical barrels were housed in the former pit until 1999, when it was cleaned and abandoned.

Impacts primarily in groundwater (methyl isobutyl ketone [MIBK] and VOCs), soil (MIBK, acetone, and metals), and soil vapor (VOCs, hydrogen sulfide, and methane) were identified near AOC B. Installation of a Sub-Slab Depressurization System (SSDS) was completed in the Spring of 2020. The overall VI risk for Building 4 is reduced because the low permeability soils limit the volume of soil gas that can be drawn into the building by natural forces. This coupled with the high natural air exchange rates documented in previous studies (Jacobs, 2019) reduces the level of concern associated with these strongly anaerobic gases. This is further supported by the continued long-term operation of hydrogen sulfide and LEL monitors within Building 4 by Evans Chemetics to ensure worker safety.

AOC C/Gorham Street – Source Area for PCBs – An area of Gorham Street adjacent to Building 2 has been identified as AOC C because in 1995, surficial soil in the area was contaminated with less than 100 pounds of sodium hydrosulfide, which had discharged from a tank vent on the roof of Building 2. Another area along the eastern side of Gorham Street showed exceedances of PCBs, SVOCs, and metals, while the western side showed exceedances of PCBs. Impacts in soil (PCBs, arsenic, and cadmium) were identified at AOC C/Gorham Street.

AOC D – Monitoring Well MW-11S Area – AOC D is adjacent and south of Building 3 and was identified as monitoring well MW-11S because of elevated concentrations of metals, specifically arsenic, and elevated groundwater pH. Operations at Building 3 area include storing and handling various caustic materials, primarily sodium hydrosulfide, which typically has a pH of 11 to 12. Several aboveground storage tanks containing this compound are inside and adjacent to the building. A caustic truck loading-unloading area also is located east of MW-11S. Impacts primarily in groundwater (arsenic) were identified at AOC D.

AOC E – Monitoring Well MW-10 Area – AOC E consists of monitoring well MW-10, which is north of Building 2B near a subsurface sump that collects wash water from floor drains in Buildings 2A and 2B. The area is covered by grass and concrete-paved areas. Impacts in groundwater (MIBK, toluene, and metals) were identified at AOC E.

SWMU 7 – Hazardous Waste Container Storage Area – The hazardous waste container storage area identified as SWMU 7 was a RCRA-regulated storage shed that measured approximately 16 feet by 10 feet and was approximately 200 feet west of Building 16. At present, the area that originally constituted SWMU 7 is within a concrete-paved and diked area that has an engineered foundation to support the WWTP bioreactors. No documented releases exist for this area.

SWMU 8 – Former Nonhazardous Waste Container Storage Area – the nonhazardous waste container storage area identified as SWMU 8 is an outdoor area that was built in 1975 in the northwestern portion of the facility within SWMU 1. It was used for temporary storage of 55-gallon plastic drums of nonhazardous still-bottom wastes, which originated from the various facility processes. Initially, the area was unpaved, with an earthen dike on three sides (open to the east). A concrete pad with concrete dikes was constructed in the area and was open to the north. The eastern third of the concrete pad was removed during WWTP construction. The existing SWMU 8 ground cover is paved with concrete, and the area is still used for storing nonhazardous wastes in plastic totes. No releases have been reported from SWMU 8.

SWMU 25B – MPA Residue Hoppers – SWMU 25B is one of three cooling areas for the MPA distillation residue. It is south of the WWTP tanks. No releases have been reported from SWMU 25B.

SWMU(s)/AOC(s) identified at the facility were addressed by the ICM(s) described in Section 6, as well as two previous Statements of Basis for AOC A – Cayuga/Seneca Canal and Raceway and SWMU 1 – Former Village of Waterloo Dump Site.

Groundwater

Groundwater monitoring was required for facility-wide groundwater impact. Routine groundwater monitoring began at the facility in 2011 and continues to present. Groundwater samples are collected from sitewide wells for the following analyses:

- VOCs
- SVOCs
- TAL Metals

In 2015, a Monitored Natural Attenuation program was started which focused on AOC B and AOC D, and on the effectiveness of natural hydrologic, biological, mineralogical, and geochemical conditions in reducing the concentrations and attenuating the migration of related contaminants of concern (COCs) in groundwater.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs AOC B			
1,2-Dichloroethane	0.51 to 2.6	0.6	4 of 68
cis-1,2-dichloroethene	ND to 20.3	5	4 of 68
4-Methyl-2-pentanone (MIBK)	ND to 25,700	50	18 of 68
Acetone	ND to 2,640	50	8 of 68
Benzene	ND to 2.7	1	2 of 68
Carbon Disulfide	ND to 155	60	7 of 68
Chlorobenzene	ND to 24	5	2 of 68
Chloroform	ND to 242	7	4 of 68
Methylene chloride	ND to 113	5	12 of 68
Toluene	ND to 89.2	5	15 of 68
Vinyl chloride	ND to 2.57	2	1 of 68
VOCs – AOC D			
Acetone	ND to 58.2	50	2 of 18
Chlorobenzene	ND to 8.6	5	1 of 18
VOCs – Sitewide			
cis-1,2-Dichloroethene	ND to 8.1	5	6 of 27

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
trans-1,2-Dichloroethene	ND to 10.7	5	5 of 27
SVOCs – AOC B			
3,3'-Dichlorobenzidine	ND to 47.4	5	1 of 34
Benzo (a) anthracene	ND to 0.214	0.002	4 of 34
Benzo(a)pyrene	ND to 0.202	0.002	4 of 34
Benzo(b)fluoranthene	ND to 0.232	0.002	4 of 34
Benzo(k)fluoranthene	ND to 0.22	0.002	2 of 34
Bis(2-ethylhexyl) phthalate	ND to 18.8	5	2 of 34
Chrysene	ND to 0.274	0.002	5 of 34
Fluoranthene	ND to 0.734	50	5 of 34
Indeno(1,2,3-cd)pyrene	ND to 0.153	0.002	2 of 34
Phenol	ND to 18.3	1	1 of 34
SVOCs – AOC C			
Benzo(b)fluoranthene	ND to 0.0736	0.002	1 of 9
Chrysene	ND to 0.0784	0.002	1 of 9
SVOCs – AOC D			
Benzo(a)anthracene	ND to 0.0414	0.002	1 of 14
Benzo(b)fluoranthene	ND to 0.0368	0.002	1 of 14

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
Benzo(a)pyrene	ND to 0.166	0.002	1 of 14
Chrysene	ND to 0.066	0.002	3 of 14
Phenol	ND to 7.58	1	1 of 14
SVOCs – SWMU 7			
Bis(2-ethylhexyl)phthalate	ND to 8.93	5	1 of 2
SVOCs – Sitewide			
Benzo(a)anthracene	ND to 0.0825	0.002	1 of 27
Benzo(a)pyrene	ND to 0.116	0.002	1 of 27
Benzo(b)fluoranthene	ND to 0.166	0.002	1 of 27
Benzo(k)fluoranthene	ND to 0.139	0.002	1 of 27
Bis(2-ethylhexyl)phthalate	ND to 5.36	5	1 of 27
Chrysene	ND to 0.175	0.002	1 of 27
Indeno(1,2,3-c,d)pyrene	ND to 0.0992	0.002	1 of 27
Metals – AOC B			
Arsenic	ND to 537	25	14 of 70
Barium	ND to 2160	1000	3 of 70
Chromium	ND to 11,000	50	11 of 70
Metals – AOC D			

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
Arsenic	ND to 21,800	25	22 of 49
Cadmium	ND to 102	5	5 of 49
Chromium	ND to 587	50	6 of 49
Copper	ND to 288	200	1 of 49
Lead	ND to 2,940	25	2 of 49
Mercury	ND to 5.23	0.7	1 of 49
Zinc	ND to 5950	2000	1 of 49

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

Groundwater contamination identified during the RFI was addressed during the ICMs described in Section 6, the approved abbreviated CMS, and the two previous Statements of Basis.

The primary groundwater contaminants of concern are VOCs, acetone and MIBK; individual polycyclic aromatic hydrocarbons (PAHs); and select metals including arsenic, cadmium, chromium, copper, lead, mercury, and zinc. Their presence appears to be the result of former wool textile mill manufacturing and chemical intermediate manufacturing; specifically, improper disposal and poor housekeeping practices resulting in subsurface contamination.

Soil

Surface and subsurface soil samples were collected at the facility during the RFI. Surface soil samples were collected from a depth of 0-2 inches to assess direct human exposure. Subsurface soil samples were collected from a depth of 2 – 20 feet to assess soil contamination impacts to groundwater. The results indicate that soils at the site exceed the unrestricted SCG for volatile and semi-volatile organics and metals.

The soil results were screened and evaluated based on the following:

- NYSDEC Industrial soil cleanup objectives (SCOs): Protection of Public Health (6 NYCRR Part 375-6.8(b)) – used within fenced boundaries of facility
- NYSDEC Residential SCOs: Protection of Public Health (6 NYCRR Part 375-6.8(b)) – used for Gorham Street area where there are bordering residential properties
- Supplemental Soil Cleanup Objectives for Industrial or Residential as appropriate, as presented in Table 1 of Commissioner's Policy (CP)-51, NYSDEC Soil Cleanup Guidance (October 21, 2010)

- TAGM 4046 Recommended Soil Cleanup Objectives for MIBK (NYSDEC, January 1994, modified July 2001)

*Historical soil data at the site were screened against the screening criteria available at the time (NYSDEC TAGM 4046). In 2010, NYSDEC issued the CP-51/Soil Cleanup Guidance, which applies to each of the remedial programs administered by its Division of Environmental Remediation to replace the TAGM 4046: Determination of SCOs and Cleanup Levels, dated January 24, 1994. This included the restricted use SCO for protection of public health and supplemental SCOs for industrial and residential use. The industrial values were used as soil screening levels for the areas that are within fenced boundaries of the facility, whereas the residential values were used as soil screening levels for the areas adjacent to AOC C because of the bordering residential properties. NYSDEC requested that for soil compounds that do not have a remedial program SCO as defined in NYCRR Part 375-6.8, values should be used from the SSCOs of the Soil Cleanup Guidance and from TAGM 4046 for MIBK.

Table 2 - Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Residential SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
VOCs – AOC B					
4-Methy-2-pentanone (MIBK)	2.2 – 8.1	1.0	3 of 3	1.0	3 of 3
SVOCs – AOC D					
Benzo(a)pyrene	ND – 5.3	1.0	1 of 3	1.1	1 of 3
Metals – AOC B					
Mercury	ND – 7.04	0.81	1 of 3	5.7	1 of 3
Metals – AOC C					
Arsenic (0 – 2) inches	2.63 - 205	16	46 of 65	16	46 of 65
Arsenic (2 - 60) inches	1.88 - 438	16	128 of 273	16	128 of 273
Cadmium (0 – 2) inches	ND – 26.7	2.5	28 of 53	2.5	28 of 53
Cadmium (2 – 60) inches	ND – 1150	2.5	65 of 244	2.5	65 of 244
Metals – AOC D					
Arsenic	7.4 – 89.4	16	2 of 3	16	2 of 3

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(b), Residential for Protection of Public Health Soil Cleanup Objectives.
c- SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Industrial Use (AOC B, AOCD) or Residential Use (AOC C), unless otherwise noted.

Soil contamination identified during the RFI was addressed during the ICMs described in Section 6, the approved abbreviated CMS, and the two previous Statements of Basis.

Soil investigations took place over many years at many of the individual SWMUs/AOCs. Based on soil investigations conducted at the site, the presence of VOCs (specifically MIBK), PAHs, metals, PCBs, and sodium hydrosulfide has resulted in the contamination of soils at the site.

SWMU 7 – Soil sampling performed showed one exceedance of the screening level for chloroform, which was subsequently removed. The presence of low-level PAHs are attributed to coal dust or natural organic material in the soil.

SWMU 8 – PAHs and metals were detected in concentrations exceeding screening levels, which was subsequently addressed by covering with an asphalt cap.

SWMU 25B –VOCs, PAHs, and metals were detected above soil screening levels. Elevated levels were attributed primarily to fill observe and were detected in a limited area in the southern portion of SWMU 25B, which is concrete paved.

AOC B – VOCs (specifically MIBK) and metal concentrations were detected above the soil screening criteria beneath the floor in the Building 4 pit area. In 1999, the attributable pit underwent permanent closure.

AOC C/Gorham Street – Surficial soils near Building 2 were found to be impacted with sodium hydrosulfide, which had discharged from a tank vent located on the Building 2 roof. Subsurface soil was identified when samples collected from soil borings along the western side of Gorham Street showed concentrations of PCBs, SVOCs, metals above screening levels. The area was delineated and subsequently, the impacted soil was removed. Post-excavation samples were below applicable screening criteria.

Soil samples collected from shallow soil sampling locations on the eastern (residential) side of Gorham Street contained arsenic and cadmium concentrations exceeding NYSDEC Residential SCO. Arsenic and cadmium are present in shallow soil at concentrations that exceed the restricted use soil clean-up objectives residential screening levels of 16 mg/kg and 2.5 mg.kg, respectively. A 2013 Interim Corrective Measure (ICM) was initiated and included – containment using the existing asphalt parking lot as a cap; extending the asphalt cap; constructing a soil cover over the remaining area of lower impacted soil around the larger sized parking lot; removing shallow soil from the adjacent residential area; and removing bank restoration excavation soil. Within the area west of Gorham Street, placement of a cover was not implementable because of the extreme slope so the exiting site security fence was extended to include this area.

AOC D – Arsenic is present at concentrations exceeding the NYSDEC Industrial SCO at two locations upgradient of MW-11S; however, arsenic concentrations in soil were generally consistent with background and naturally occurring concentrations. Localized elevated arsenic concentrations appeared in two 2011 samples of artificial fill.

AOC E – Concentrations of arsenic exceed the NYSDEC Industrial SCO at two locations. The limited soil impacts are proposed to be addressed as part of the sitewide environmental easement after completing other onsite remediation activities.

Soil Vapor

The evaluation of the potential for soil vapor intrusion resulting from the presence of facility related soil or groundwater contamination was conducted by the sampling of soil vapor, sub-slab soil vapor under structures, and indoor air inside structures. At this facility due to the presence of buildings in the impacted area a full suite of samples was collected to evaluate whether soil vapor intrusion was occurring.

Vapor intrusion investigations have been performed throughout the facility and included building surveys and collecting soil vapor, indoor air, outdoor air, and subslab vapor samples for VOCs because potential indoor air exposures in the buildings may result from VOCs in subsurface soil and/or shallow groundwater volatilizing, migrating vertically (and horizontally to a limited extent) through the soil column and entering buildings through foundation cracks or openings. The VOCs may then be inhaled by building occupants. Sources of constituents potentially contributing to vapor intrusion are the VOCs detected in soil and in groundwater under or near the buildings.

The analytical results for the subslab soil vapor samples were compared to the following criteria intended to evaluate potential risks during site investigation activities and operations by onsite facility workers:

- Subslab screening concentrations of sulfur compounds were calculated from the American Conference of Governmental Industrial Hygienists (2016) threshold limit values (TLVs) using an attenuation factor of 0.03 for indoor air.
- A methane screening concentration of 4 percent by volume (80 percent of LEL).
- VOC screening concentrations for a commercial exposure scenario were calculated using the Vapor Intrusion Screening Level Calculator Version 3.5.1 (USEPA 2016) for subslab concentrations with a 10^{-5} target cancer risk, a hazard quotient of 1, and the default 0.03 attenuation factor.

The vapor intrusion sampling events were conducted during the heating season (October 1 to May 31).

The sampling program commenced with the administrative building (Building 13) where subslab vapor and indoor air samples were collected inside the building, one outdoor air sample was collected near Building 13, and background air samples were collected off-site. The production buildings (Buildings 1, 2, 2-A, 2-B, 3, 4, and the Tank Storage Area) were sampled for indoor air, subslab vapor, and outdoor (ambient) air. The areas sampled for soil gas and ambient air included SWMU 1 and Gorham Street to evaluate the potential vapor intrusion pathways to the residences along Gorham Street, across from the facility, and to the residence south and downgradient of SWMU 1. Indoor air, outdoor air, and crawl space samples were collected at a residential property downgradient of SWMU 1 which HCC later purchased and demolished.

Further investigation was required for facility-wide soil vapor and indoor air. These facility-wide investigations continued to be performed from 2011 through 2012. The investigations have concluded no further investigation is needed for facility-wide soil vapor and indoor air.

Investigation results at AOC B – Building 4 – identified impacts in soil vapor (VOCs, hydrogen sulfide, and methane). During the May 2017 sampling event, hydrogen sulfide was detected in soil vapor samples from 11 of the 13 subslab sampling locations, with one location exceeding the screening criteria. Methane was detected in laboratory soil vapor samples from 2 of the 13 subslab sampling locations, both exceeding the screening criteria. One or more of 22 VOCs were detected in soil vapor samples from each of the 13 subslab sampling locations. Four VOCs (chloroform, ethylbenzene, trichloroethene, and xylenes were detected at concentrations exceeding the screening criteria. The concentrations for compounds exceeding the screening criteria are summarized below.

Table 3 – AOC B Sub-Slab Vapor

Detected Constituents	**Concentration Range Detected (ug/m^3)**	**Lower Explosive Limit (LEL)**	**Frequency Exceedance**
Hydrogen Sulfide (H_2S)	<7.0 to 180,000,000	N/A	25 of 27
Methane (CH_2)	0.0018 to 81.3	5% by Volume	9 of 27
VOCs			
Detected Constituents	**Concentration Range Detected (ug/m^3)**	**NYSDOH 2003[1]**	**Frequency Exceedance**
Chloroform	ND to 16000	1.4	16 of 17
Ethylbenzene	ND to 630	5.7	6 of 17
Trichloroethene	0.36 to 65	0.5	12 of 16
m,p-xylene	ND - 2600	12	7 of 17
o-xylene	ND to 660	7.6	5 of 17

1. NYSDOH 2003: Study of Volatile Organic Chemicals in Air of Fuel Oil Heated Homes

See Figures 10 through 15.

Based on the concentration detected, and in comparison, with the NYSDOH Soil Vapor Intrusion Guidance, soil vapor contamination identified during the RFI is being addressed as part of the ICM for AOC B – Building 4, as described in Section 6.

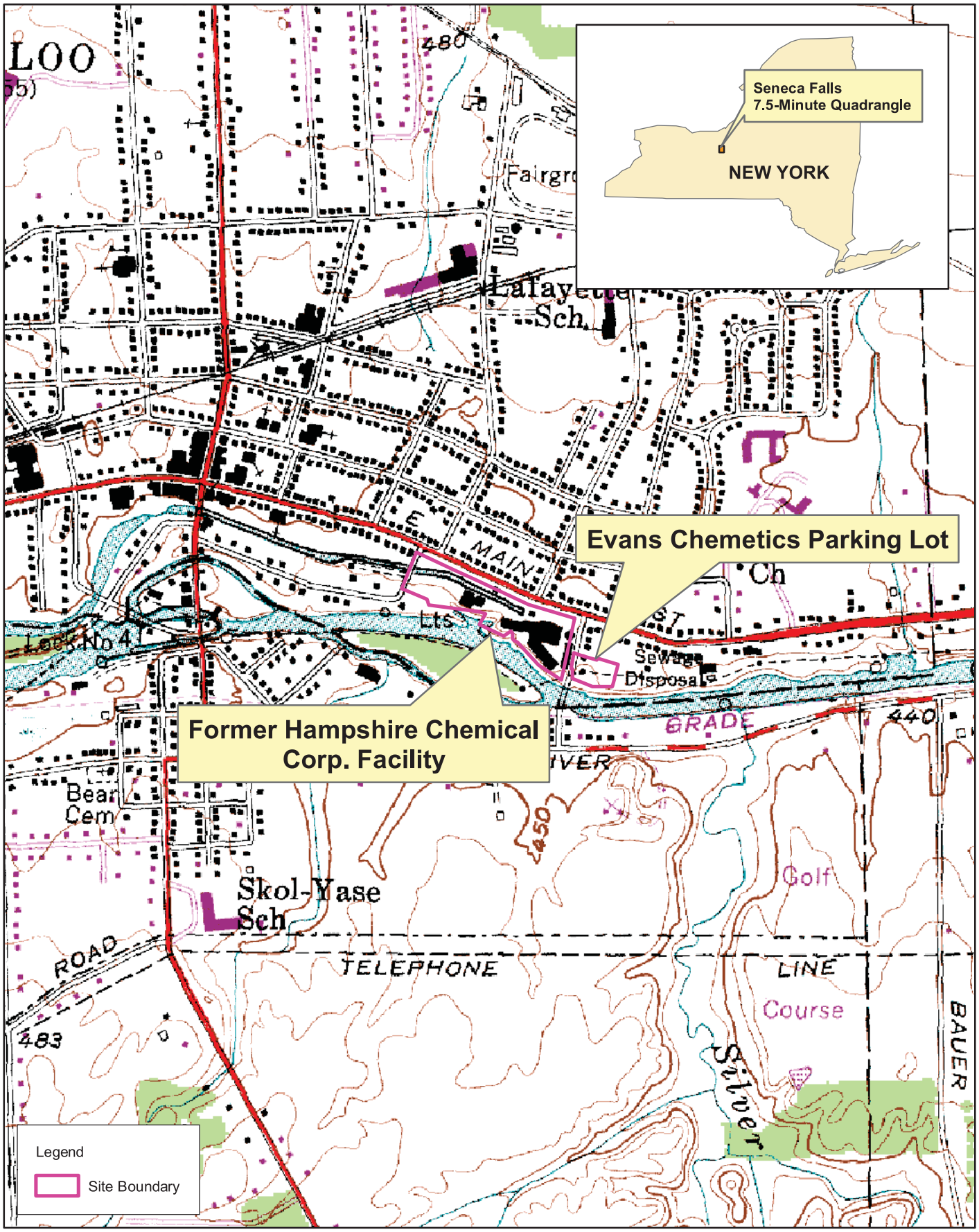

Figure 1-1
Facility Location Map
Sitewide Corrective Measures Study
Former Hampshire Chemical Corp. Facility
Waterloo, New York

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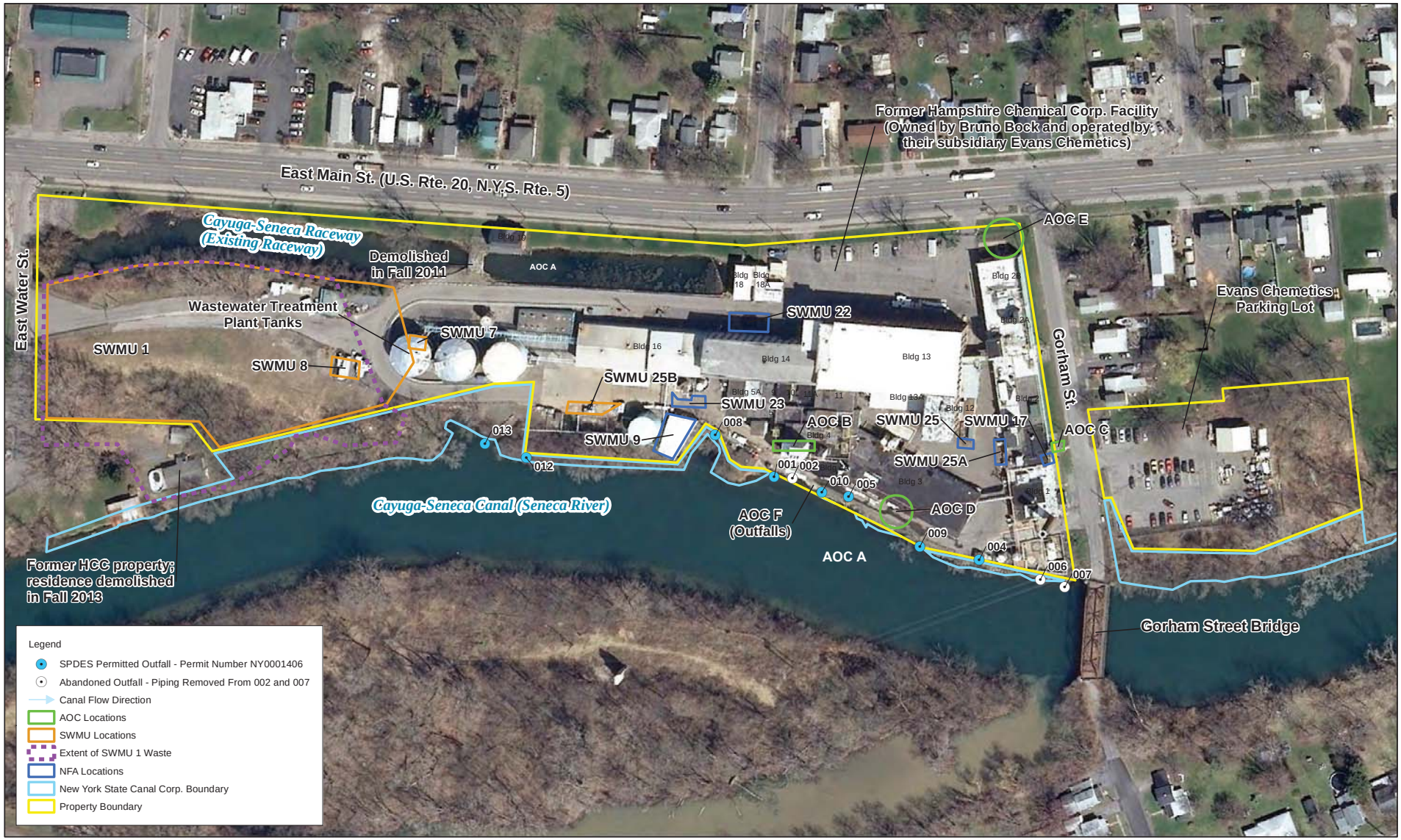

0 120 240
Feet

Notes:
NFA - No further action
NFA issued by NYSDEC on Dec. 2, 2003.
SWMU 28 (NFA) - Wash Water Sewer System (Buildings 2, 3, 4, 9, 13, 14 and 16)
SWMU 29 (NFA) - SPDES Sewer System (Buildings 1, 2, 2A, 2B, 3, 4, 5, 14 and Reactor)

Figure 1-2
Facility Layout and SWMU/AOC Locations
Sitewide Corrective Measures Study
Former Hampshire Chemical Corp. Facility
Waterloo, New York

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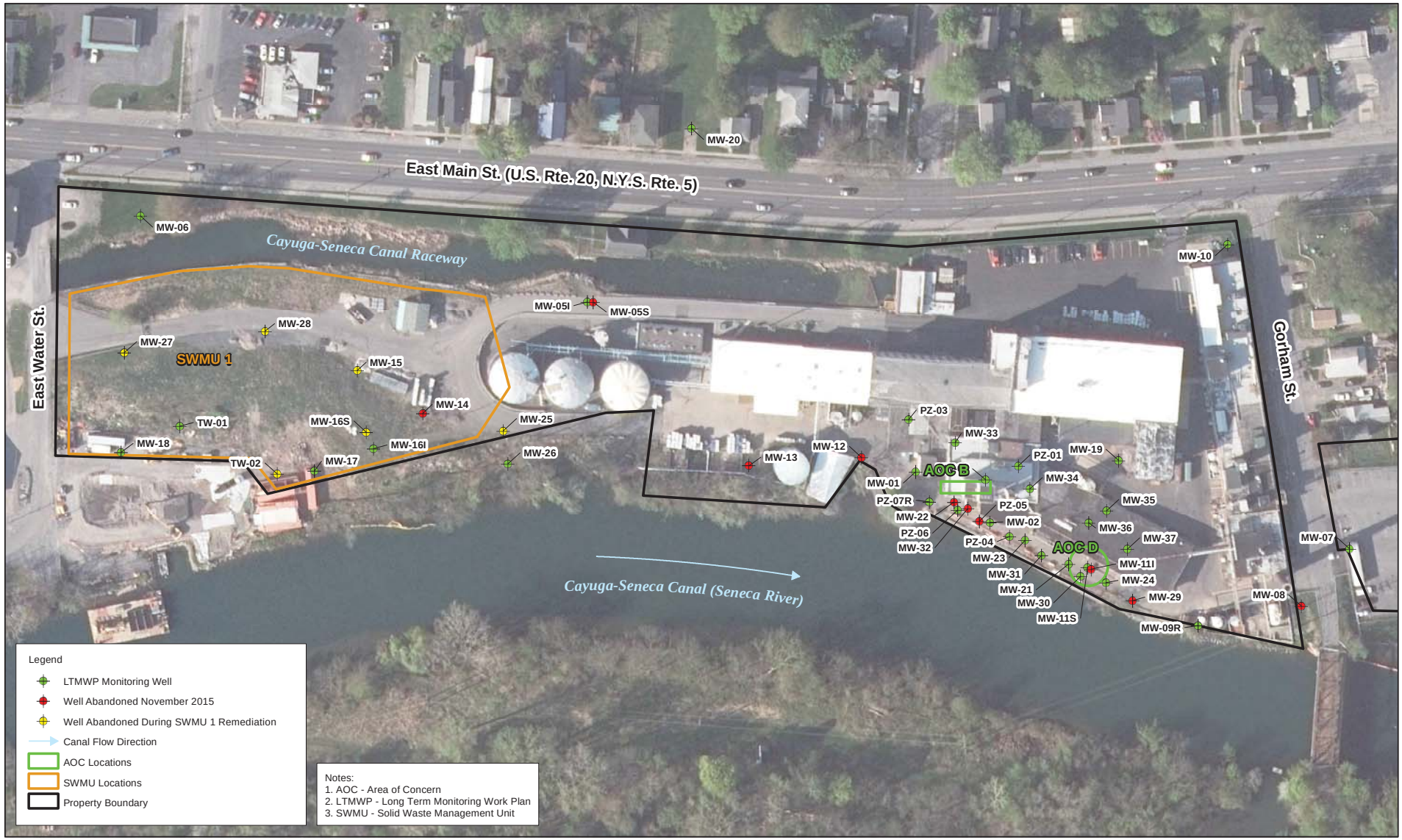

Figure 1-3
Sitewide Wells and Piezometers Locations
Sitewide Corrective Measures Study
Former Hampshire Chemical Corp. Facility
Waterloo, New York

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MKE \\LAKEFRONT\PROJ\GIS\DOW\WATERLOO\REPORTS\2016\GWMONITORINGRESULTS_NOV2015\MAPFILES\FIGURE 1-2 - SITE LAYOUT MAP.MXD JHANSEN1 8/9/2016 8:27:48 PM

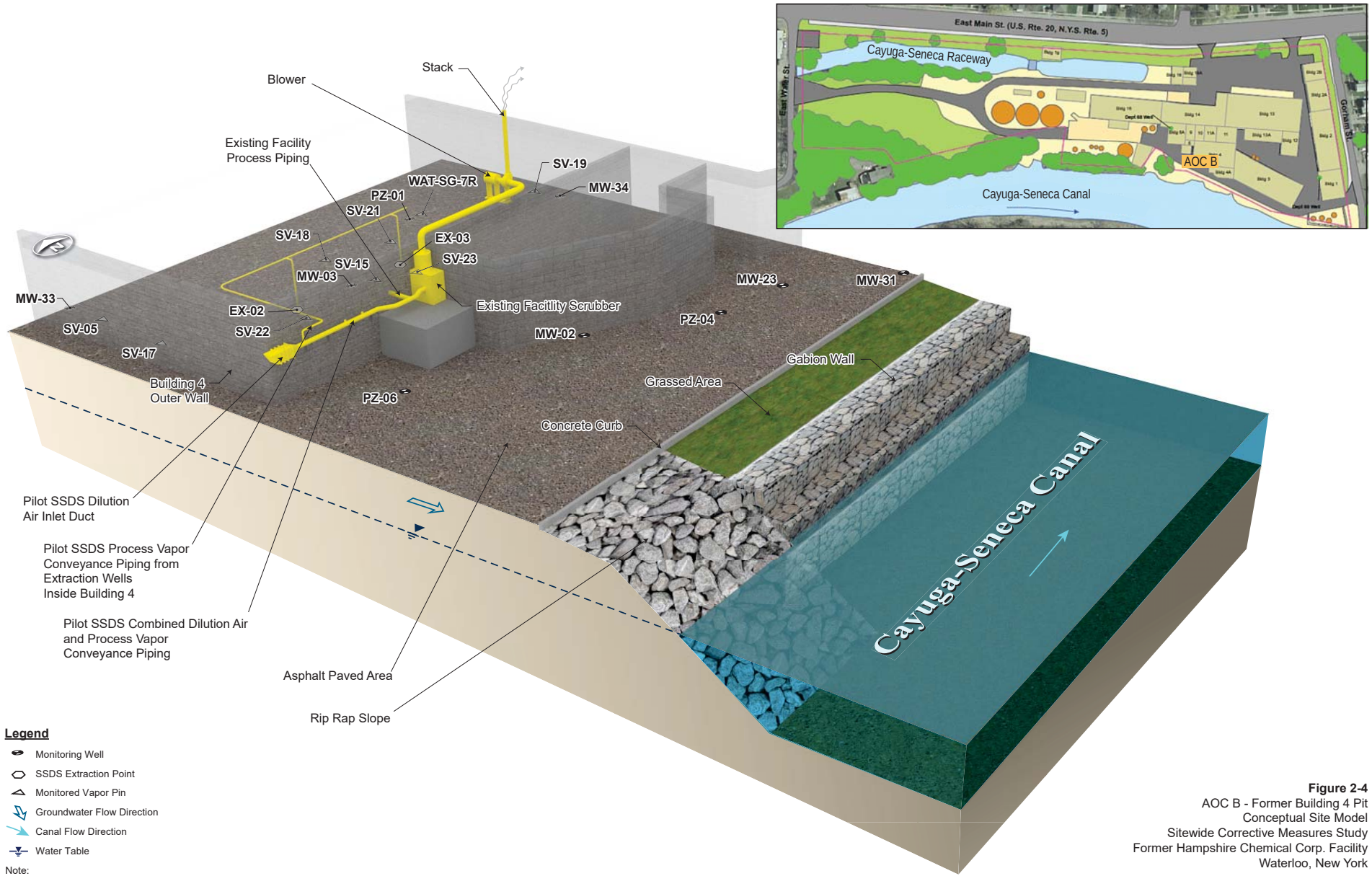

Figure 2-4
AOC B - Former Building 4 Pit
Conceptual Site Model
Sitewide Corrective Measures Study
Former Hampshire Chemical Corp. Facility
Waterloo, New York

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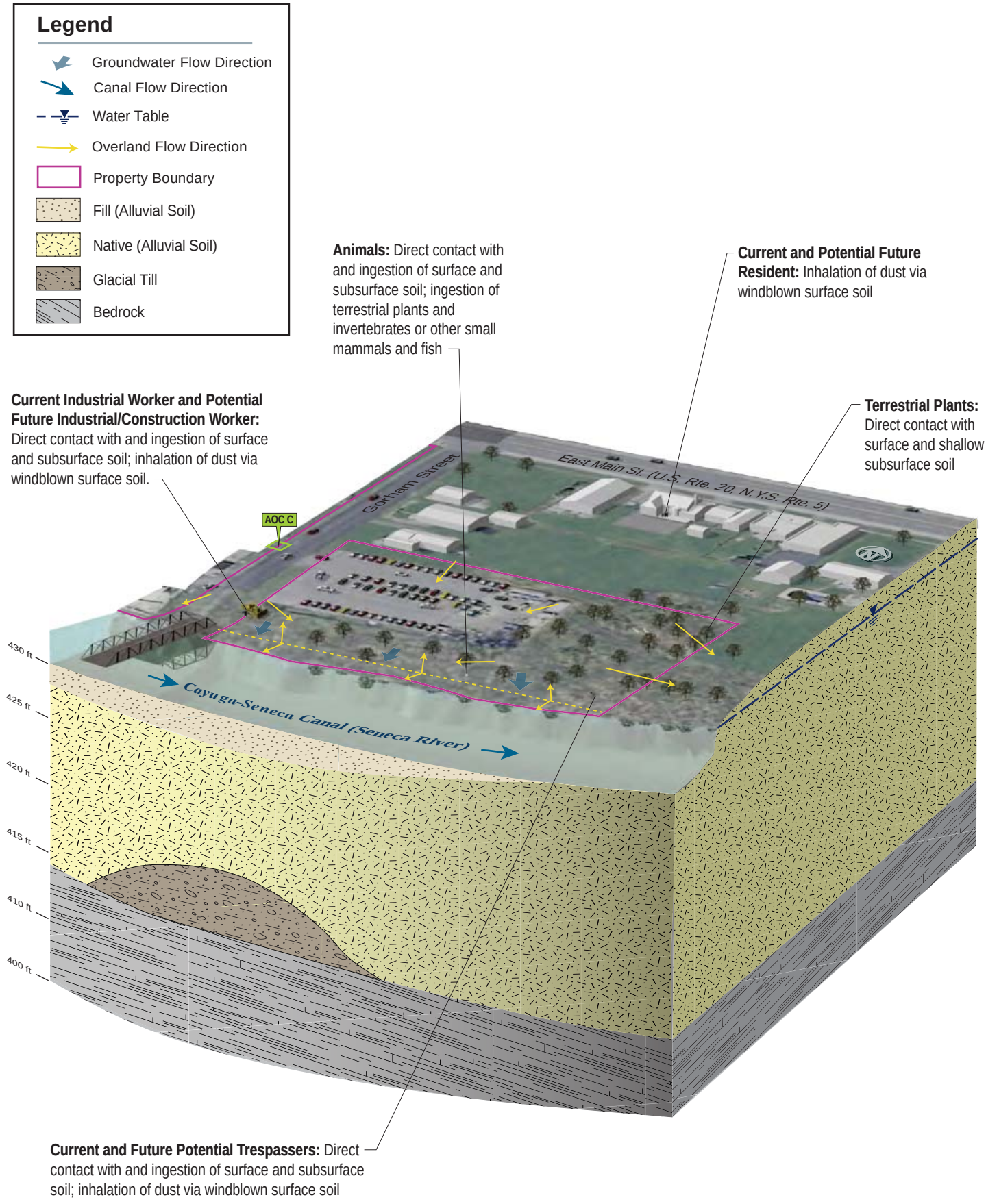

Figure 2-5
AOC C/Gorham Street Conceptual Site Model
Sitewide Corrective Measures Study
Former Hampshire Chemical Corp. Facility
Waterloo, New York

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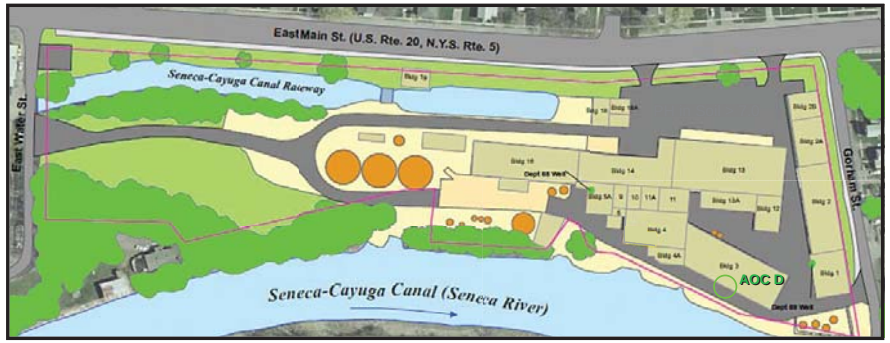

NASH Tanks
PZ-04
MW-23
NASH Tanks
MW-31
C′
AOC D
MW-21
C
Monochloro
Acetic Acid
Tank
MW-11S
MW-30
MW-11I
MW-24
Seneca - Cayuga Canal (Seneca River)
MW-29
Truck
Unloading
Area
Sodium
Hydrosulfide
Tanks

Legend

- Piezometer
- Monitoring Well
- AOC Locations
- Groundwater Flow Direction

Not to Scale

Figure 2-6
AOC D - MW-11S
Conceptual Site Model
Sitewide Corrective Measures Study
Former Hampshire Chemical Corp. Facility
Waterloo, New York

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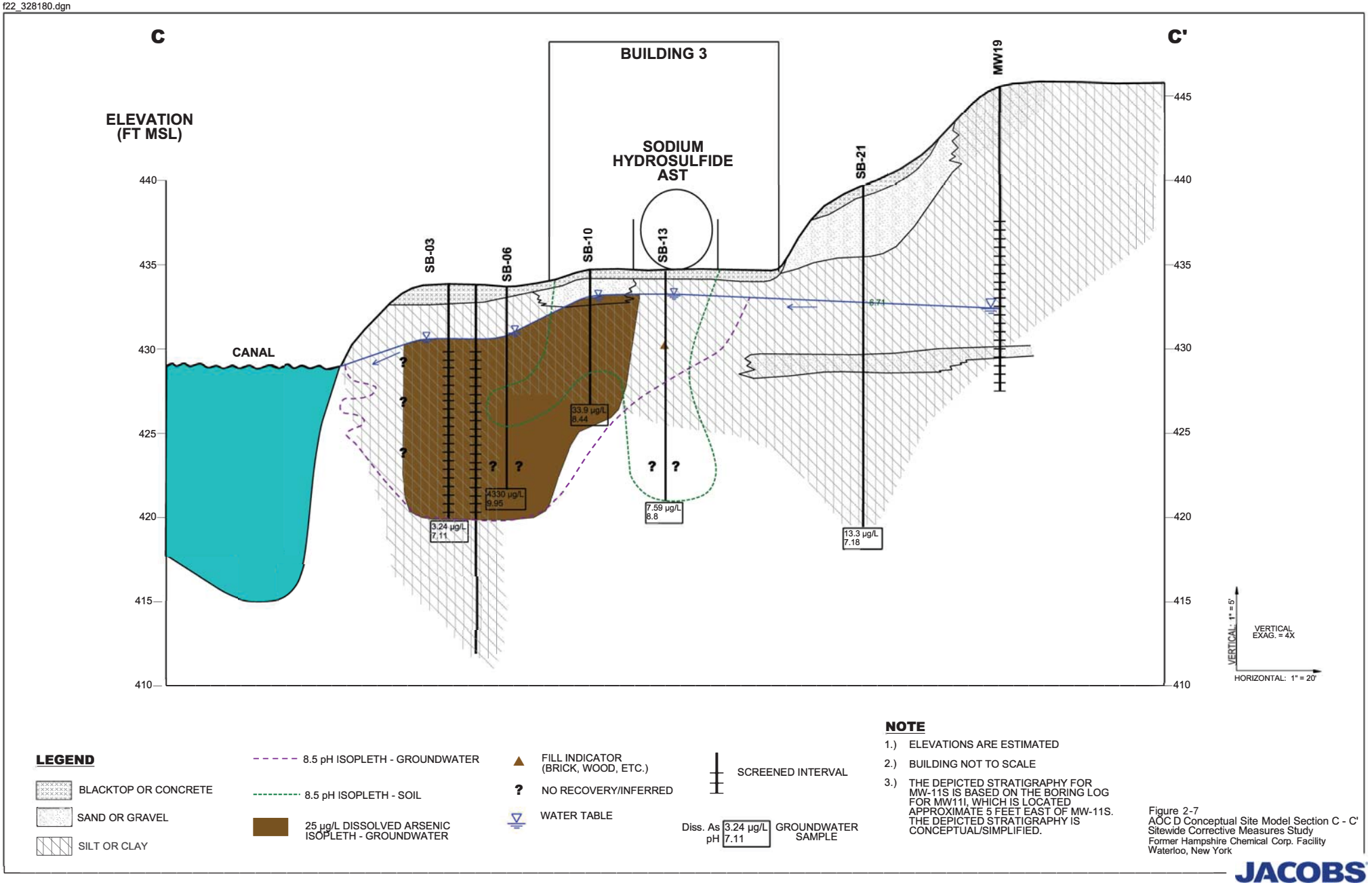

LEGEND

- BLACKTOP OR CONCRETE
- SAND OR GRAVEL
- SILT OR CLAY
- 8.5 pH ISOPLETH - GROUNDWATER
- 8.5 pH ISOPLETH - SOIL
- 25 µg/L DISSOLVED ARSENIC ISOPLETH - GROUNDWATER
- FILL INDICATOR (BRICK, WOOD, ETC.)
- ? NO RECOVERY/INFERRED
- WATER TABLE
- SCREENED INTERVAL
- Diss. As 3.24 µg/L / pH 7.11 GROUNDWATER SAMPLE

NOTE

1.) ELEVATIONS ARE ESTIMATED

2.) BUILDING NOT TO SCALE

3.) THE DEPICTED STRATIGRAPHY FOR MW-11S IS BASED ON THE BORING LOG FOR MW11I, WHICH IS LOCATED APPROXIMATE 5 FEET EAST OF MW-11S. THE DEPICTED STRATIGRAPHY IS CONCEPTUAL/SIMPLIFIED.

Figure 2-7
AOC D Conceptual Site Model Section C - C'
Sitewide Corrective Measures Study
Former Hampshire Chemical Corp. Facility
Waterloo, New York

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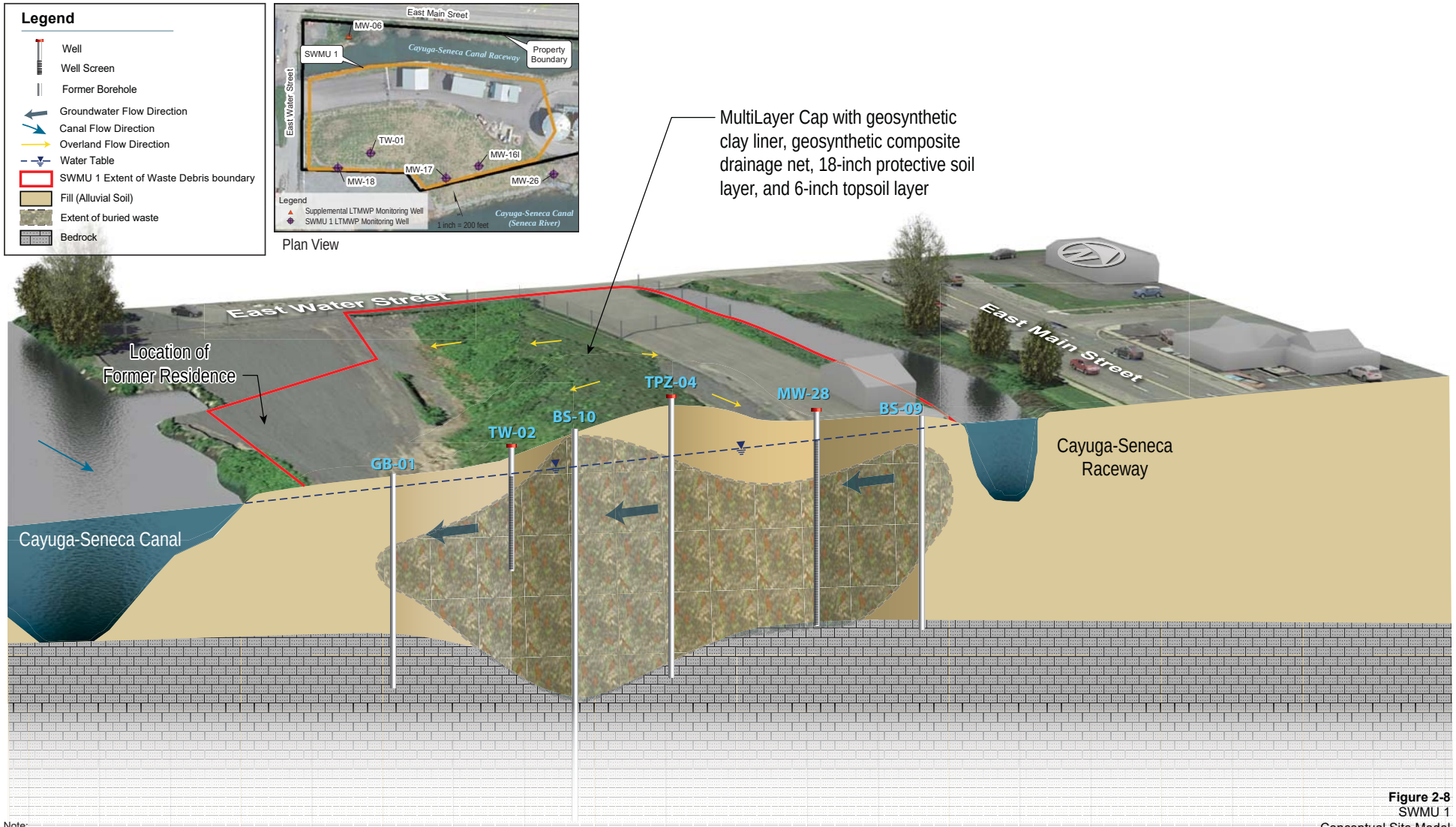

Note:
TW-02 well screen: 5.5 ft to 10.5 ft bgs
MW-28 well screen: 6 ft to 16 ft bgs

Not to Scale

Figure 2-8
SWMU 1
Conceptual Site Model
Sitewide Corrective Measures Study
Former Hampshire Chemical Corp. Facility
Waterloo, New York

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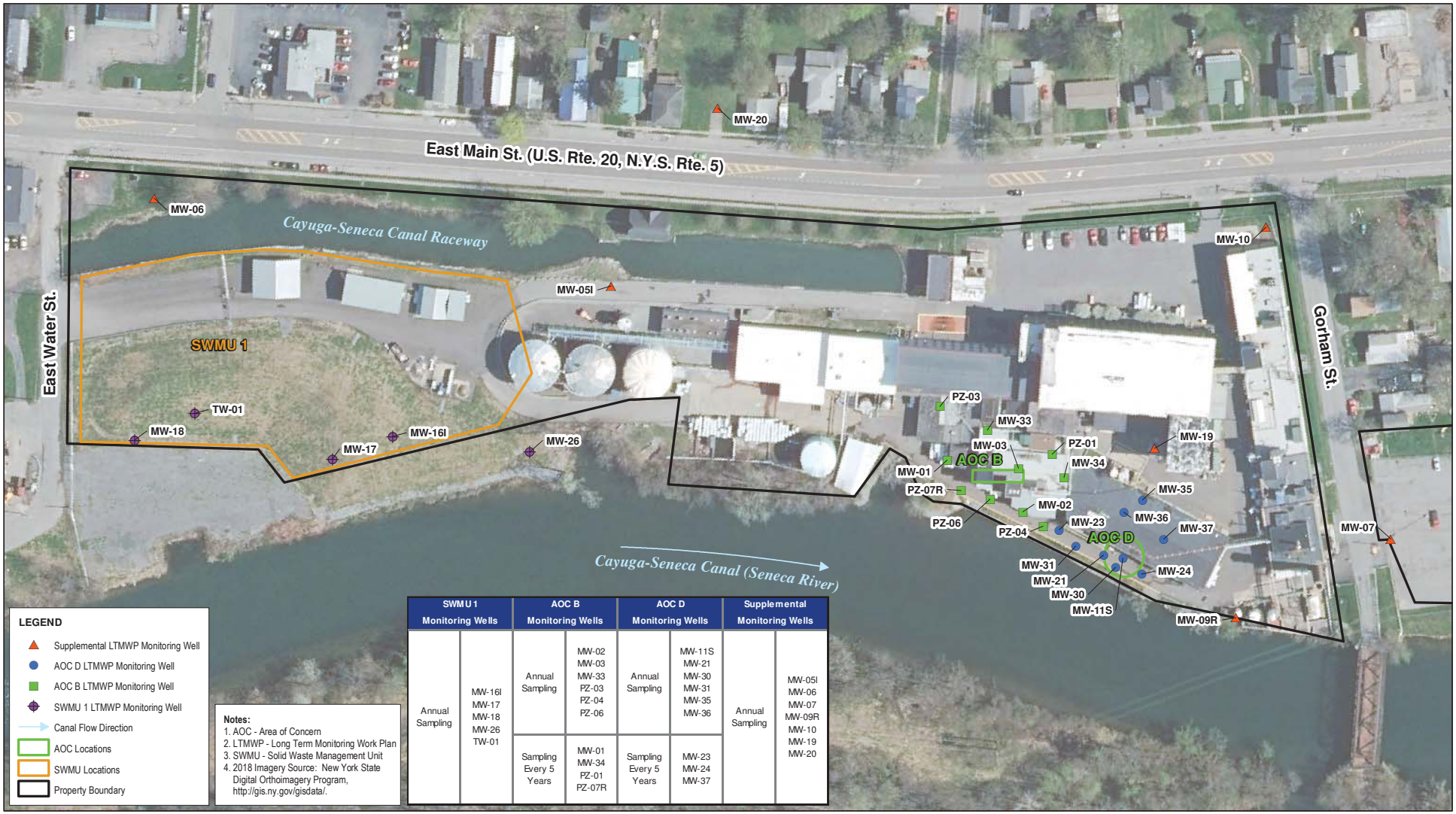

SWMU 1 Monitoring Wells		AOC B Monitoring Wells		AOC D Monitoring Wells		Supplemental Monitoring Wells	
Annual Sampling	MW-16I MW-17 MW-18 MW-26 TW-01	Annual Sampling	MW-02 MW-03 MW-33 PZ-03 PZ-04 PZ-06	Annual Sampling	MW-11S MW-21 MW-30 MW-31 MW-35 MW-36	Annual Sampling	MW-05I MW-06 MW-07 MW-09R MW-10 MW-19 MW-20
		Sampling Every 5 Years	MW-01 MW-34 PZ-01 PZ-07R	Sampling Every 5 Years	MW-23 MW-24 MW-37		

Figure 3-1.
AOC B, AOC D and SWMU 1 Long Term Monitoring Well Network
Sitewide Corrective Measures Study
Former Hampshire Chemical Corp. Facility, Waterloo, New York

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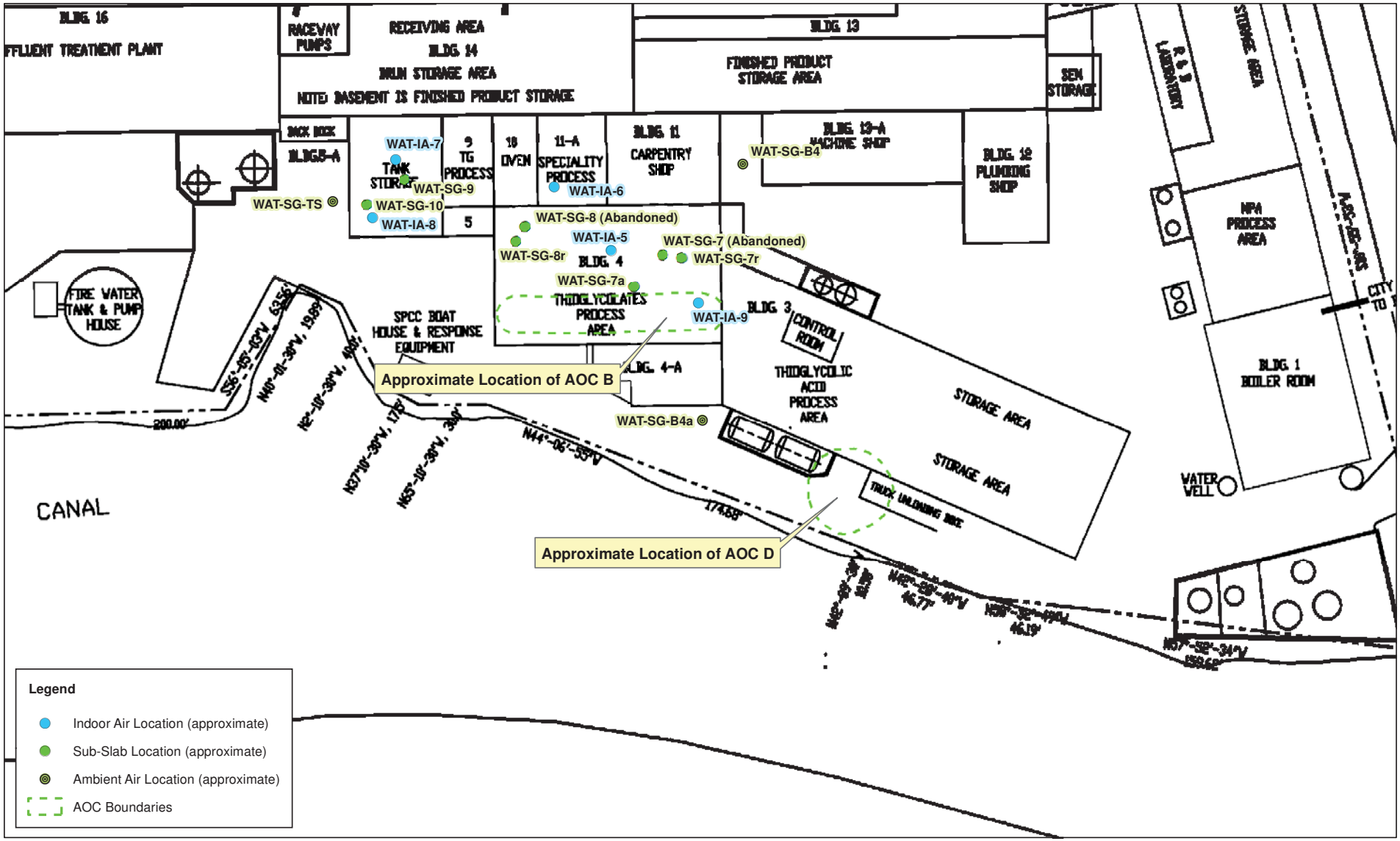

Figure 10
Proposed Indoor Air, Sub-Slab, and Ambient Air Sample Locations
2011 Soil Vapor Intrusion Work Plan
Former Hampshire Chemical Corp. Facility
Waterloo, New York

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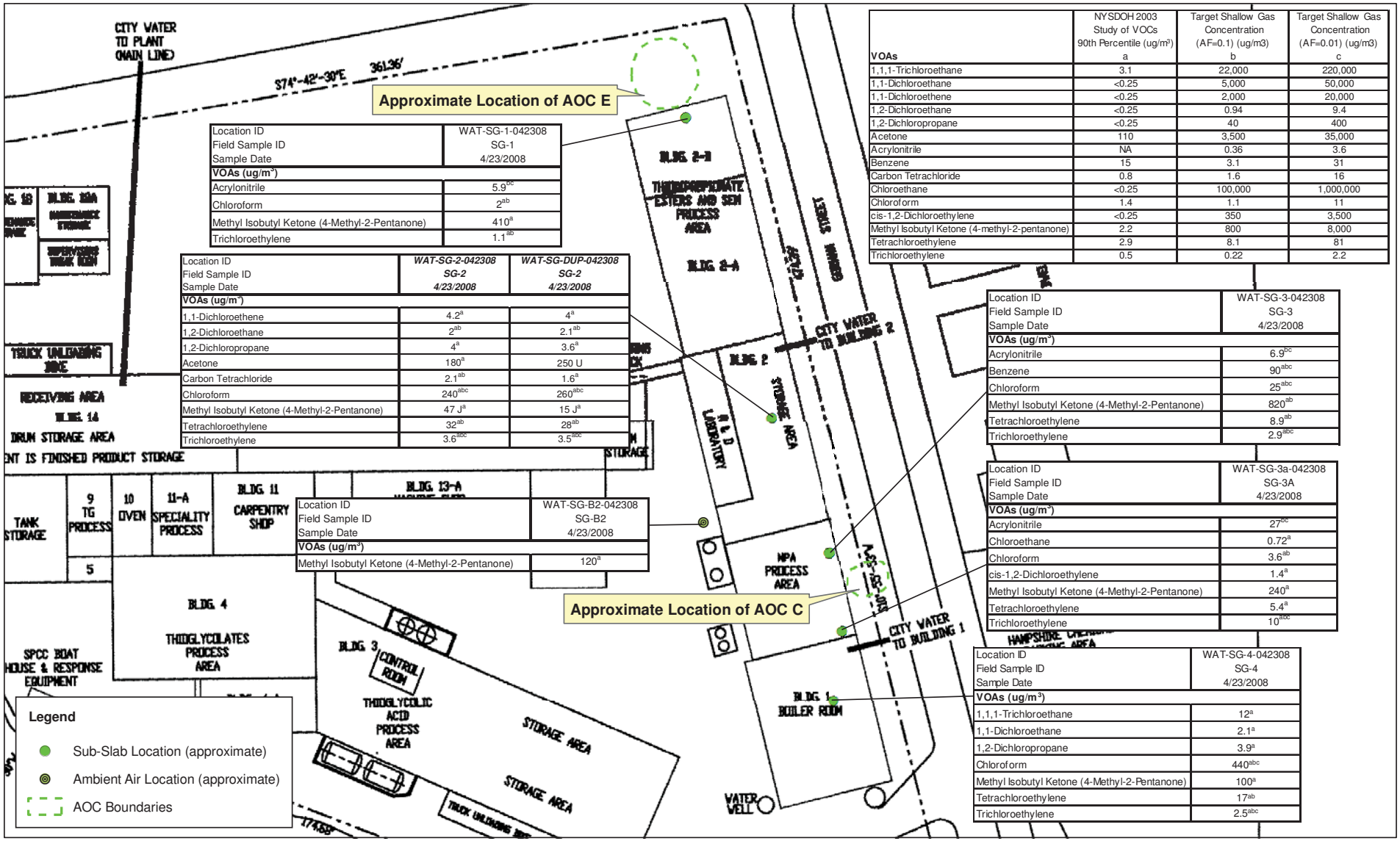

µg/m³ = micrograms per cubic meter
AF = attenuation factor

Figure 11
Soil Vapor Results Exceeding Screening Levels, Buildings 1 and 2
Soil Vapor Investigation Report, Buildings 1, 2, 3, 4, and Tank Storage Area
Former Hampshire Chemical Corp Facility
Waterloo, New York

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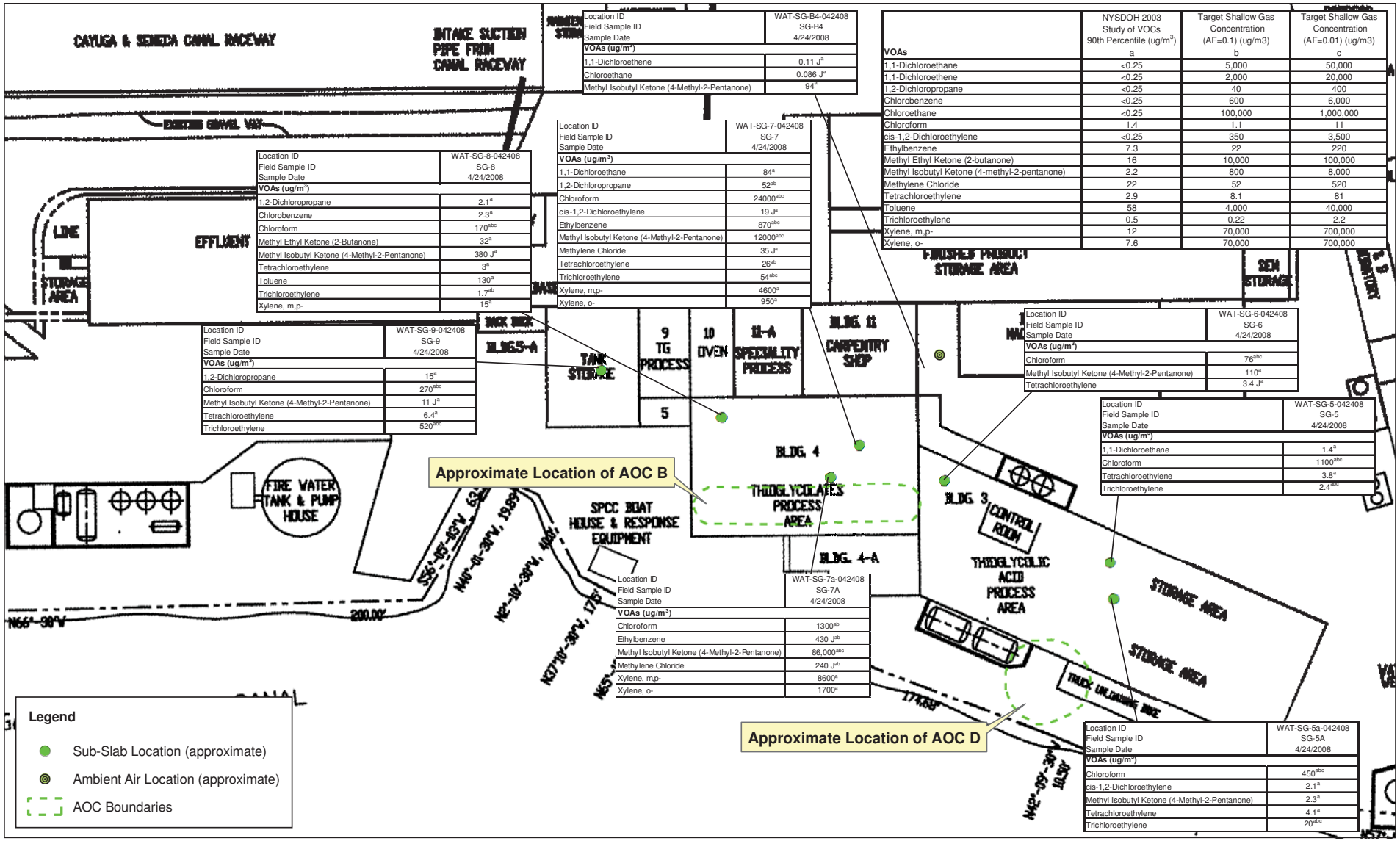
\\NORTHEND\PROJ\DOW\WATERLOO\GIS_FOLDERS\MAPFILES\SMWU1\SOIL VAPOR INVESTIGATION REPORT\FIGURE4_SOILVAPOR_RESULTS_2003.MXD MUNWIN 4/29/2010 15:16:17



Location ID	WAT-SG-8-042408
Field Sample ID	SG-8
Sample Date	4/24/2008
VOAs (ug/m³)	
1,2-Dichloropropane	2.1[a]
Chlorobenzene	2.3[a]
Chloroform	170[abc]
Methyl Ethyl Ketone (2-Butanone)	32[a]
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	380 J[a]
Tetrachloroethylene	3[a]
Toluene	130[a]
Trichloroethylene	1.7[ab]
Xylene, m,p-	15[a]

Location ID	WAT-SG-9-042408
Field Sample ID	SG-9
Sample Date	4/24/2008
VOAs (ug/m³)	
1,2-Dichloropropane	15[a]
Chloroform	270[abc]
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	11 J[a]
Tetrachloroethylene	6.4[a]
Trichloroethylene	520[abc]

Location ID	WAT-SG-B4-042408
Field Sample ID	SG-B4
Sample Date	4/24/2008
VOAs (ug/m³)	
1,1-Dichloroethene	0.11 J[a]
Chloroethane	0.086 J[a]
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	94[a]

Location ID	WAT-SG-7-042408
Field Sample ID	SG-7
Sample Date	4/24/2008
VOAs (ug/m³)	
1,1-Dichloroethane	84[a]
1,2-Dichloropropane	52[ab]
Chloroform	24000[abc]
cis-1,2-Dichloroethylene	19 J[a]
Ethylbenzene	870[abc]
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	12000[abc]
Methylene Chloride	35 J[a]
Tetrachloroethylene	26[ab]
Trichloroethylene	54[abc]
Xylene, m,p-	4600[a]
Xylene, o-	950[a]

Location ID	WAT-SG-7a-042408
Field Sample ID	SG-7A
Sample Date	4/24/2008
VOAs (ug/m³)	
Chloroform	1300[ab]
Ethylbenzene	430 J[ab]
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	86,000[abc]
Methylene Chloride	240 J[ab]
Xylene, m,p-	8600[a]
Xylene, o-	1700[a]

Location ID	WAT-SG-6-042408
Field Sample ID	SG-6
Sample Date	4/24/2008
VOAs (ug/m³)	
Chloroform	76[abc]
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	110[a]
Tetrachloroethylene	3.4 J[a]

Location ID	WAT-SG-5-042408
Field Sample ID	SG-5
Sample Date	4/24/2008
VOAs (ug/m³)	
1,1-Dichloroethane	1.4[a]
Chloroform	1100[abc]
Tetrachloroethylene	3.8[a]
Trichloroethylene	2.4[abc]

Location ID	WAT-SG-5a-042408
Field Sample ID	SG-5A
Sample Date	4/24/2008
VOAs (ug/m³)	
Chloroform	450[abc]
cis-1,2-Dichloroethylene	2.1[a]
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	2.3[a]
Tetrachloroethylene	4.1[a]
Trichloroethylene	20[abc]

VOAs	NYSDOH 2003 Study of VOCs 90th Percentile (ug/m³) a	Target Shallow Gas Concentration (AF=0.1) (ug/m3) b	Target Shallow Gas Concentration (AF=0.01) (ug/m3) c
1,1-Dichloroethane	<0.25	5,000	50,000
1,1-Dichloroethene	<0.25	2,000	20,000
1,2-Dichloropropane	<0.25	40	400
Chlorobenzene	<0.25	600	6,000
Chloroethane	<0.25	100,000	1,000,000
Chloroform	1.4	1.1	11
cis-1,2-Dichloroethylene	<0.25	350	3,500
Ethylbenzene	7.3	22	220
Methyl Ethyl Ketone (2-butanone)	16	10,000	100,000
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	2.2	800	8,000
Methylene Chloride	22	52	520
Tetrachloroethylene	2.9	8.1	81
Toluene	58	4,000	40,000
Trichloroethylene	0.5	0.22	2.2
Xylene, m,p-	12	70,000	700,000
Xylene, o-	7.6	70,000	700,000

µg/m³ = micrograms per cubic meter
AF = attenuation factor

Figure 12
Soil Vapor Results Exceeding Screening Levels, Buildings 3 and 4
Soil Vapor Investigation Report, Buildings 1, 2, 3, 4, and Tank Storage Area
Former Hampshire Chemical Corp Facility
Waterloo, New York

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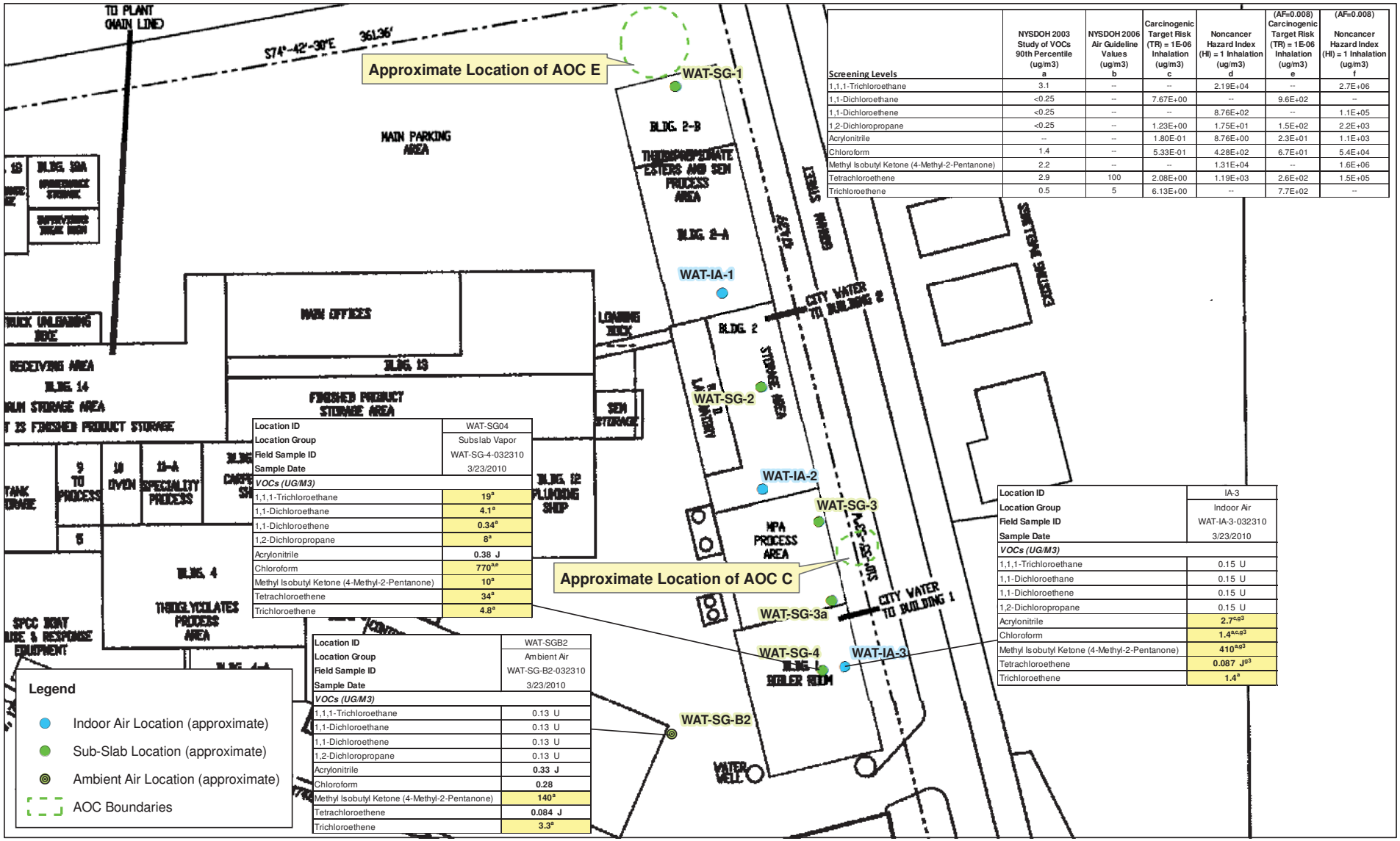

Location ID	WAT-SG04
Location Group	Subslab Vapor
Field Sample ID	WAT-SG-4-032310
Sample Date	3/23/2010
VOCs (UG/M3)	
1,1,1-Trichloroethane	19[a]
1,1-Dichloroethane	4.1[a]
1,1-Dichloroethene	0.34[a]
1,2-Dichloropropane	8[a]
Acrylonitrile	0.38 J
Chloroform	770[a,e]
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	10[a]
Tetrachloroethene	34[a]
Trichloroethene	4.8[a]

Location ID	WAT-SGB2
Location Group	Ambient Air
Field Sample ID	WAT-SG-B2-032310
Sample Date	3/23/2010
VOCs (UG/M3)	
1,1,1-Trichloroethane	0.13 U
1,1-Dichloroethane	0.13 U
1,1-Dichloroethene	0.13 U
1,2-Dichloropropane	0.13 U
Acrylonitrile	0.33 J
Chloroform	0.28
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	140[a]
Tetrachloroethene	0.084 J
Trichloroethene	3.3[a]

Location ID	IA-3
Location Group	Indoor Air
Field Sample ID	WAT-IA-3-032310
Sample Date	3/23/2010
VOCs (UG/M3)	
1,1,1-Trichloroethane	0.15 U
1,1-Dichloroethane	0.15 U
1,1-Dichloroethene	0.15 U
1,2-Dichloropropane	0.15 U
Acrylonitrile	2.7[c,g3]
Chloroform	1.4[a,c,g3]
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	410[a,g3]
Tetrachloroethene	0.087 J[g3]
Trichloroethene	1.4[a]

Screening Levels	NYSDOH 2003 Study of VOCs 90th Percentile (ug/m3) a	NYSDOH 2006 Air Guideline Values (ug/m3) b	Carcinogenic Target Risk (TR) = 1E-06 Inhalation (ug/m3) c	Noncancer Hazard Index (HI) = 1 Inhalation (ug/m3) d	(AF=0.008) Carcinogenic Target Risk (TR) = 1E-06 Inhalation (ug/m3) e	(AF=0.008) Noncancer Hazard Index (HI) = 1 Inhalation (ug/m3) f
1,1,1-Trichloroethane	3.1	--	--	2.19E+04	--	2.7E+06
1,1-Dichloroethane	<0.25	--	7.67E+00	--	9.6E+02	--
1,1-Dichloroethene	<0.25	--	--	8.76E+02	--	1.1E+05
1,2-Dichloropropane	<0.25	--	1.23E+00	1.75E+01	1.5E+02	2.2E+03
Acrylonitrile	--	--	1.80E-01	8.76E+00	2.3E+01	1.1E+03
Chloroform	1.4	--	5.33E-01	4.28E+02	6.7E+01	5.4E+04
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	2.2	--	--	1.31E+04	--	1.6E+06
Tetrachloroethene	2.9	100	2.08E+00	1.19E+03	2.6E+02	1.5E+05
Trichloroethene	0.5	5	6.13E+00	--	7.7E+02	--

UG/M3 = micrograms per cubic meter
AF = attenuation factor

Figure 13
Building 1
Former Hampshire Chemical Corp Facility
Waterloo, New York

\\NORTHEND\PROJ\DOW\WATERLOO\GIS_FOLDERS\MAPFILES\VI REPORT\FIGURE3_BLDG1.MXD MUNWIN 8/25/10

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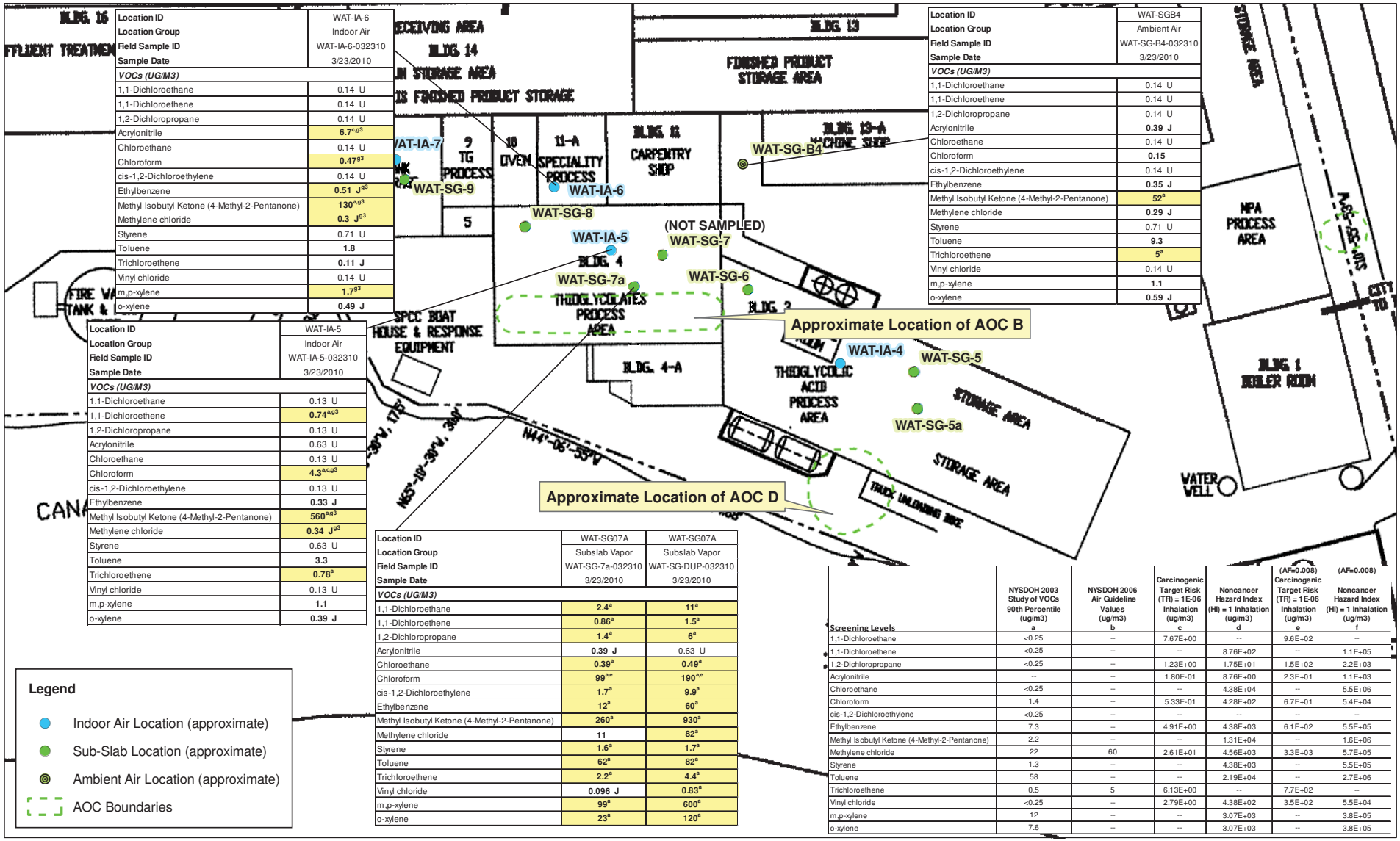

Location ID	WAT-IA-6
Location Group	Indoor Air
Field Sample ID	WAT-IA-6-032310
Sample Date	3/23/2010
VOCs (UG/M3)	
1,1-Dichloroethane	0.14 U
1,1-Dichloroethene	0.14 U
1,2-Dichloropropane	0.14 U
Acrylonitrile	6.7[c,g3]
Chloroethane	0.14 U
Chloroform	0.47[g3]
cis-1,2-Dichloroethylene	0.14 U
Ethylbenzene	0.51 J[g3]
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	130[a,g3]
Methylene chloride	0.3 J[g3]
Styrene	0.71 U
Toluene	1.8
Trichloroethene	0.11 J
Vinyl chloride	0.14 U
m,p-xylene	1.7[g3]
o-xylene	0.49 J

Location ID	WAT-SGB4
Location Group	Ambient Air
Field Sample ID	WAT-SG-B4-032310
Sample Date	3/23/2010
VOCs (UG/M3)	
1,1-Dichloroethane	0.14 U
1,1-Dichloroethene	0.14 U
1,2-Dichloropropane	0.14 U
Acrylonitrile	0.39 J
Chloroethane	0.14 U
Chloroform	0.15
cis-1,2-Dichloroethylene	0.14 U
Ethylbenzene	0.35 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	52[a]
Methylene chloride	0.29 J
Styrene	0.71 U
Toluene	9.3
Trichloroethene	5[a]
Vinyl chloride	0.14 U
m,p-xylene	1.1
o-xylene	0.59 J

Location ID	WAT-IA-5
Location Group	Indoor Air
Field Sample ID	WAT-IA-5-032310
Sample Date	3/23/2010
VOCs (UG/M3)	
1,1-Dichloroethane	0.13 U
1,1-Dichloroethene	0.74[a,g3]
1,2-Dichloropropane	0.13 U
Acrylonitrile	0.63 U
Chloroethane	0.13 U
Chloroform	4.3[a,c,g3]
cis-1,2-Dichloroethylene	0.13 U
Ethylbenzene	0.33 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	560[a,g3]
Methylene chloride	0.34 J[g3]
Styrene	0.63 U
Toluene	3.3
Trichloroethene	0.78[a]
Vinyl chloride	0.13 U
m,p-xylene	1.1
o-xylene	0.39 J

Location ID	WAT-SG07A	WAT-SG07A
Location Group	Subslab Vapor	Subslab Vapor
Field Sample ID	WAT-SG-7a-032310	WAT-SG-DUP-032310
Sample Date	3/23/2010	3/23/2010
VOCs (UG/M3)		
1,1-Dichloroethane	2.4[a]	11[a]
1,1-Dichloroethene	0.86[a]	1.5[a]
1,2-Dichloropropane	1.4[a]	6[a]
Acrylonitrile	0.39 J	0.63 U
Chloroethane	0.39[a]	0.49[a]
Chloroform	99[a,c]	190[a,c]
cis-1,2-Dichloroethylene	1.7[a]	9.9[a]
Ethylbenzene	12[a]	60[a]
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	260[a]	930[a]
Methylene chloride	11	82[a]
Styrene	1.6[a]	1.7[a]
Toluene	62[a]	82[a]
Trichloroethene	2.2[a]	4.4[a]
Vinyl chloride	0.096 J	0.83[a]
m,p-xylene	99[a]	600[a]
o-xylene	23[a]	120[a]

Screening Levels	NYSDOH 2003 Study of VOCs 90th Percentile (ug/m3) a	NYSDOH 2006 Air Guideline Values (ug/m3) b	Carcinogenic Target Risk (TR) = 1E-06 Inhalation (ug/m3) c	Noncancer Hazard Index (HI) = 1 Inhalation (ug/m3) d	(AF=0.008) Carcinogenic Target Risk (TR) = 1E-06 Inhalation (ug/m3) e	(AF=0.008) Noncancer Hazard Index (HI) = 1 Inhalation (ug/m3) f
1,1-Dichloroethane	<0.25	--	7.67E+00	--	9.6E+02	--
1,1-Dichloroethene	<0.25	--	--	8.76E+02	--	1.1E+05
1,2-Dichloropropane	<0.25	--	1.23E+00	1.75E+01	1.5E+02	2.2E+03
Acrylonitrile	--	--	1.80E-01	8.76E+00	2.3E+01	1.1E+03
Chloroethane	<0.25	--	--	4.38E+04	--	5.5E+06
Chloroform	1.4	--	5.33E-01	4.28E+02	6.7E+01	5.4E+04
cis-1,2-Dichloroethylene	<0.25	--	--	--	--	--
Ethylbenzene	7.3	--	4.91E+00	4.38E+03	6.1E+02	5.5E+05
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	2.2	--	--	1.31E+04	--	1.6E+06
Methylene chloride	22	60	2.61E+01	4.56E+03	3.3E+03	5.7E+05
Styrene	1.3	--	--	4.38E+03	--	5.5E+05
Toluene	58	--	--	2.19E+04	--	2.7E+06
Trichloroethene	0.5	5	6.13E+00	--	7.7E+02	--
Vinyl chloride	<0.25	--	2.79E+00	4.38E+02	3.5E+02	5.5E+04
m,p-xylene	12	--	--	3.07E+03	--	3.8E+05
o-xylene	7.6	--	--	3.07E+03	--	3.8E+05

Legend

- Indoor Air Location (approximate)
- Sub-Slab Location (approximate)
- Ambient Air Location (approximate)
- AOC Boundaries

0 40 80
Feet

UG/M3 = micrograms per cubic meter
AF = attenuation factor

Figure 14
Building 4
Former Hampshire Chemical Corp Facility
Waterloo, New York

\\NORTHEND\PROJ\DOW\WATERLOO\GIS_FOLDERS\MAPFILES\VI REPORT\FIGURE4_BLDG4.MXD MUNWIN 8/25/10

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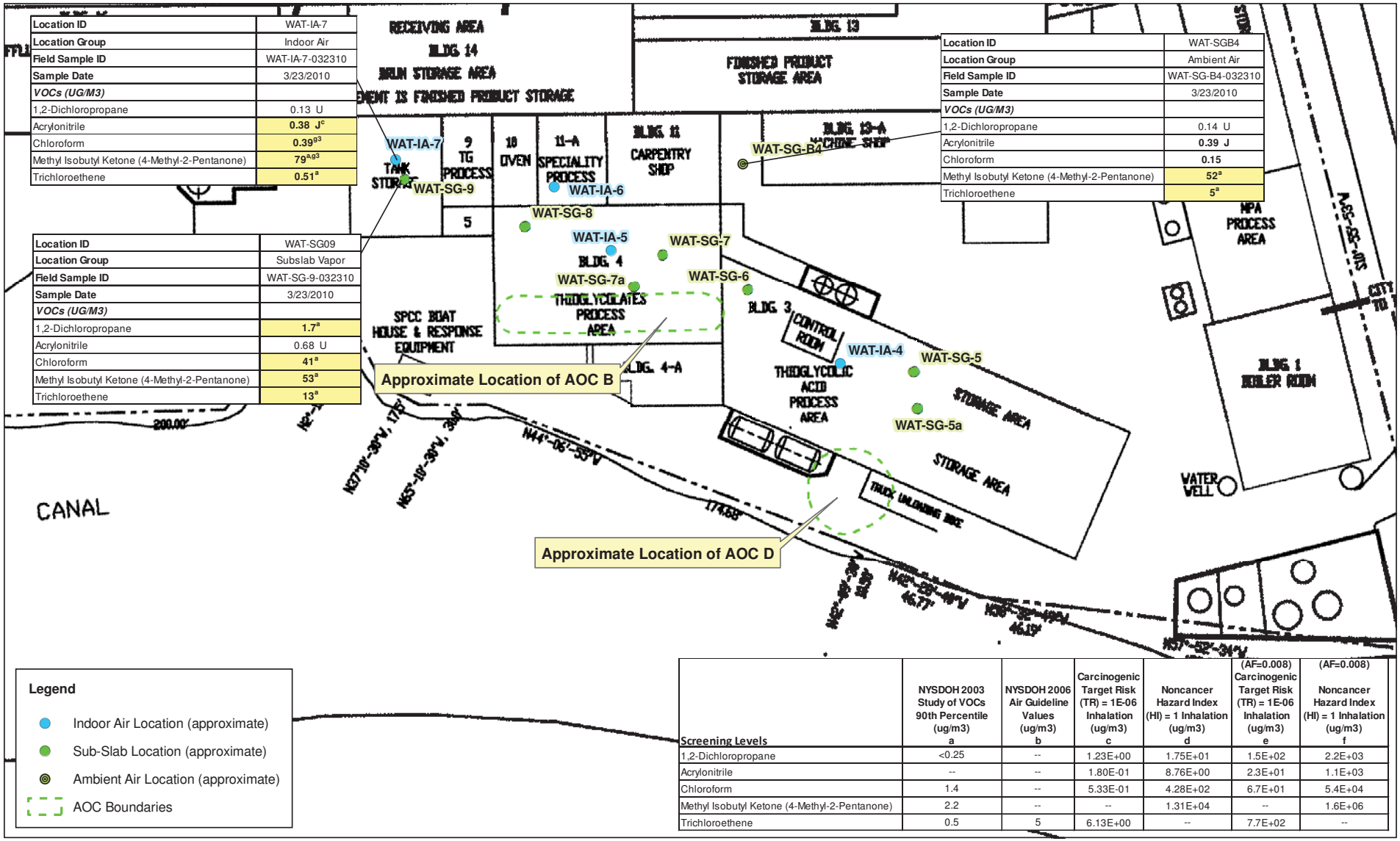

Location ID	WAT-IA-7
Location Group	Indoor Air
Field Sample ID	WAT-IA-7-032310
Sample Date	3/23/2010
VOCs (UG/M3)	
1,2-Dichloropropane	0.13 U
Acrylonitrile	**0.38 J[c]**
Chloroform	**0.39[g3]**
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	**79[a,g3]**
Trichloroethene	**0.51[a]**

Location ID	WAT-SG09
Location Group	Subslab Vapor
Field Sample ID	WAT-SG-9-032310
Sample Date	3/23/2010
VOCs (UG/M3)	
1,2-Dichloropropane	**1.7[a]**
Acrylonitrile	0.68 U
Chloroform	**41[a]**
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	**53[a]**
Trichloroethene	**13[a]**

Location ID	WAT-SGB4
Location Group	Ambient Air
Field Sample ID	WAT-SG-B4-032310
Sample Date	3/23/2010
VOCs (UG/M3)	
1,2-Dichloropropane	0.14 U
Acrylonitrile	**0.39 J**
Chloroform	**0.15**
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	**52[a]**
Trichloroethene	**5[a]**

Legend

- Indoor Air Location (approximate)
- Sub-Slab Location (approximate)
- Ambient Air Location (approximate)
- AOC Boundaries

Screening Levels	NYSDOH 2003 Study of VOCs 90th Percentile (ug/m3) a	NYSDOH 2006 Air Guideline Values (ug/m3) b	Carcinogenic Target Risk (TR) = 1E-06 Inhalation (ug/m3) c	Noncancer Hazard Index (HI) = 1 Inhalation (ug/m3) d	(AF=0.008) Carcinogenic Target Risk (TR) = 1E-06 Inhalation (ug/m3) e	(AF=0.008) Noncancer Hazard Index (HI) = 1 Inhalation (ug/m3) f
1,2-Dichloropropane	<0.25	--	1.23E+00	1.75E+01	1.5E+02	2.2E+03
Acrylonitrile	--	--	1.80E-01	8.76E+00	2.3E+01	1.1E+03
Chloroform	1.4	--	5.33E-01	4.28E+02	6.7E+01	5.4E+04
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	2.2	--	--	1.31E+04	--	1.6E+06
Trichloroethene	0.5	5	6.13E+00	--	7.7E+02	--

0 40 80
Feet

UG/M3 = micrograms per cubic meter
AF = attenuation factor

Figure 15
Tank Storage Area
Former Hampshire Chemical Corp Facility
Waterloo, New York

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Administrative Record

Former Hampshire Chemical Corp. Facility
Waterloo, Seneca County
EPA No. NYD002234763 / Site No. 850001A

September 2021

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