PROPOSED REMEDIAL ACTION PLAN

G.E. Fort Edward Plant Site
Operable Unit Number 05: 004 Outfall Area Bedrock
Remedial Program
State Superfund Project
Fort Edward, Washington County
Site No. 558004
February 2015

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375. This document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repository:

A public comment period has been set from:

February 17, 2014 to March 19, 2014

A public meeting is scheduled for the following date and location:

February 24, 2014 at the Washington County Public Health Building, Annex #2 (rear), 411 Main Street, Hudson Falls, NY

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through March 19, 2014 to:

Kevin Farrar
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
kevin.farrar@dec.ny.gov

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

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: SITE DESCRIPTION AND HISTORY

Location:
This active capacitor manufacturing facility is located at the northwest corner of Park Avenue and Broadway in the Town of Fort Edward, Washington County.

Site Features:
The 32 acre site includes several large manufacturing buildings, paved areas, a large wastewater treatment facility, and undeveloped land. Several homes border the site to the south and west, with commercial businesses and government offices to the north and east. The site is generally flat with

a gentle slope toward the south. Approximately 800 feet west of the manufacturing area, there is a nearly vertical 80 foot drop to the Hudson River.

Current Zoning/Uses:
The site, which is zoned Commercial, is an active capacitor manufacturing facility located in a mixed industrial / commercial / residential area in the Town of Fort Edward.

Past Use of Site:
The manufacturing of capacitors at the site has resulted in the release of PCBs, industrial solvents (including trichloroethene), and other compounds to the soils at the site, to the groundwater, and to the Hudson River via the former 004 outfall.

Operable Units:

The site has been divided into five operable units. 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 represents the groundwater remedial program implemented by GE under State oversight to address the overburden groundwater contaminant plume south of the site, which began in the late 1980s. This also includes the soil vapor mitigation program undertaken starting in 2005.

Operable Unit 2 represents the initial groundwater and soil remedial program implemented by GE under State oversight on the plant site property, which began in the late 1980s.

Operable Unit 3 represents the supplemental groundwater and oil recovery systems implemented by GE under State oversight on the plant site property, which began in the early 2000's.

Operable Unit 4 represents the remedial program undertaken by New York State to remove the PCB containing soils and sediments along the shore of the Hudson River in the vicinity of the former 004 wastewater outfall pipe, which was performed in the mid 2000's.

Operable Unit 5 represents the remedial program for the bedrock groundwater impacted by PCB releases from the former 004 wastewater outfall pipe.

Operable Unit (OU) 5 is the specific subject of this document. Where reference is made in this document to “the site”, it is referring to Operable Unit 05 unless noted.

OU 01, 02, 03, and 04 were addressed in previous decision documents.

A site location map is attached as Figure 1. Operable Unit 5, the bedrock groundwater plume, is depicted on Figure 2.

SECTION 4: LAND USE AND PHYSICAL SETTING

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

General Electric Company

The Department and the General Electric Company entered into a Consent Order on August 26, 2005 (Index #A5-0521-0705). This Order obligates the responsible parties to implement a RI/FS for OU5. After the remedy is selected, the Department will approach the PRPs to implement the selected remedy. If an agreement cannot be reached with the PRPs, the Department will evaluate the site for further action under the State Superfund. The PRPs are subject to legal actions by the state for recovery of all response costs the state has incurred.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Hydrogeologic testing,
- Rock borings, and monitoring well installations,
- Sampling of waste, rock core samples, and groundwater,
- Sampling of surface water and aquatic biota (fish and invertebrates),
- Pilot tests of manual and dual phase (groundwater and oil) PCB oil recovery,
- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

- groundwater
- surface water
- drinking water
- aquatic biota (fish and invertebrates)

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Results

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. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified for this Operable Unit at this site is/are:

PCB-AROCLOR 1242
1,1,2-TRICHLORETHYLENE
trans-1,2-Dichloroethene
DICHLOROBENZENE (MIXED)
TOLUENE
VINYL CHLORIDE
DIETHYL PHTHALATE

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

- groundwater
- surface water

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

IRM 004 Outfall Pipeline and Soil Removal

This IRM was performed between December 1995 and April 1996 to remove the old 004 outfall pipe and contaminated soil in the pipe bedding from the railroad tracks to the top of bank, in order to address this source of PCBs to the 004 outfall area. Approximately 4100 tons of soil and pipe bedding was removed, over a length of approximately 685 feet. The soil cleanup level used was the TAGM 4046 value of 10 ppm PCB in the subsurface. The offsite backfill was tested and met current unrestricted use soil concentrations; reused soil backfill met the TAGM standard.

IRM 004 Outfall Diversion

This IRM was performed in April 1994 to reroute the former outfall pipe so that the discharged wastewater did not mobilize contaminants from the shoreline soils/sediments near the outfall prior to their removal.

6.3: 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 Fish and Wildlife Resources Impact Analysis (FWRIA) for OU 05, which is included in the RI report, presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors.

Based upon the extensive previous investigations performed at the GE Fort Edward plant site, the analytical program focused upon VOC, SVOCs, and PCBs as the constituents of concern for the OU 5 RI/FS. The Department has concluded that Operable Unit 5 has a localized impact on biota in the Hudson River in the immediate vicinity of the former outfall.

Contaminants of concern are PCBs, chlorinated solvents (trichloroethylene trans-1,2-dichloroethane, vinyl chloride), chlorinated benzenes, phthalates, and toluene.

The impacted environmental media for OU5 are groundwater, and surface water.

Standards, criteria and guidance (SCGs) are exceeded at the site for the solvents and PCBs in groundwater, and PCBs in surface water.

6.4: 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 expected to be drinking contaminated water since public water which obtains its water from a different source was extended to affected structures. In addition, there is an on-going private well

sampling and public water connection program to minimize potential exposures associated with consumption of contaminated groundwater and to encourage all residents to connect to public water. Direct contact with contaminants in the on-site soil or groundwater is unlikely because the majority of the site is covered with buildings and pavement. People are not expected to come into direct contact with contaminated groundwater off-site unless they dig below the surface. People are not expected to come into contact with contaminated groundwater or sediment at seep locations since they are largely inaccessible due to the natural terrain and/or fenced. These areas are also posted. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), 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. The potential exists for people to inhale site contaminants in indoor air due to soil vapor intrusion in on-site buildings. Sub-slab depressurizations systems (systems that ventilate/remove the air beneath the building) have been installed in off-site buildings to prevent the indoor air quality from being affected by the contaminant in soil vapor beneath buildings.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this operable unit are:

Groundwater

RAOs for Public Health Protection

- Eliminate, to the extent practicable, potential future exposure to DNAPL in the bedrock;
- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

Surface Water

RAOs for Environmental Protection

- Eliminate, to the extent practicable, the migration of DNAPL to surface water in order to limit the migration of PCB to the Hudson River;

RAOs for Public Health Protection

- Eliminate, to the extent practicable, the migration of PCB from the bedrock to the Hudson River which contributes to the need to recommend that human consumption of fish in the vicinity of the site be limited.

SECTION 7: SUMMARY OF THE PROPOSED REMEDY

To be selected, the remedy 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 remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the Site were identified, screened and evaluated in the FS report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.

The basis for the Department's proposed remedy is set forth at Exhibit D.

The proposed remedy is referred to as the Continued DNAPL recovery, monitoring, and institutional controls remedy.

The estimated present worth cost to implement the remedy is $1,772,000. The cost to construct the remedy is estimated to be $210,000 and the estimated average annual cost is $120,000.

The elements of the proposed remedy are as follows:

1. Remedial Design

   A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principals 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.

2. Manual collection of DNAPL and associated contaminated groundwater from existing shallow and deep bedrock wells containing recoverable amounts of DNAPL (currently wells 1D6, 1D7, 2D, 7D2 and 18D6).

   Existing wells will be used to collect DNAPL and such groundwater as is removed at the same time. Recovered DNAPL will be disposed off-site at a permitted facility. Recovered groundwater will be treated on-site and discharged to the river.

3. Monitored Natural Attenuation of groundwater plume not impacted by the DNAPL collection system. Groundwater conditions will be monitored in accordance with the monitoring plan developed during design, including the installation of additional monitoring wells as needed.

4. Institutional Control

The entire GE Fort Edward plant site has an existing notice in deed which addresses future use of the overall site. In addition to this instrument, an additional control, in the form of an Environmental Easement, will be required for Operable Unit 05 which:

- requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allows the use and development of the controlled property for commercial and industrial uses 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;
- notifies off site property owners within the geographic scope of Operable Unit 05 that the bedrock groundwater is the subject of a hazardous waste remedial program under State law, and that the bedrock groundwater should not be used, including tracking future ownership and notification of future property owners;
- requires compliance with the Department approved Site Management Plan.

5. Site Management Plan

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

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

Institutional Controls: The overall GE Fort Edward plant site property, a portion of which is within the geographic scope of Operable Unit 05, has an existing notice in deed which addresses future use of the overall site, which will be supplemented by an Environmental Easement as discussed above. The site management plan will also include those elements identified in paragraph 4 for periodic certification, land use restriction, water use restrictions, and property owner tracking and notification.

Engineering Controls: DNAPL collection system.

This plan includes, but may not be limited to

o provisions for the management and inspection of the identified engineering controls;

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

- monitoring of groundwater, DNAPL, surface water and aquatic biota to assess the performance and effectiveness of the remedy; and
- a schedule of monitoring and frequency of submittals to the Department;

c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

- compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
- maintaining site access controls and Department notification; and
- providing the Department access to the site and O&M records.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium for which contamination was identified, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into three categories: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and pesticides/ polychlorinated biphenyls (PCBs). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 4 and Section 6.1.1 are also presented.

Waste/Source Areas

As described in the RI Report, the source for the contaminants found in the OU5 area was the former 004 outfall area, including the outfall box itself. This source was addressed by implementation of the two IRMs in the 1990s, and by the implementation of the OU4 remedy in 2003-04.

Groundwater

The focus of the Remedial Investigation (RI) for Operable Unit 5 at this site was to determine the fate and transport of the PCB containing dense, non-aqueous phase liquid (DNAPL) which was released to the bedrock near the outfall location via the former 004 outfall pipeline from the main manufacturing area to the east. This outfall location was constructed near the shoreline of the Hudson River, and was partially excavated into bedrock at the base of an approximately 80 to 100 foot cliff. Based upon the extensive previous investigations at the GE Fort Edward plant site, the analytical program focused upon VOC, SVOCs, and PCBs as the constituents of concern for the OU5 RI/FS. The DNAPL itself, within the bedrock, represents the primary remaining source of groundwater contamination.

The bedrock monitoring well installation and related sampling program (rock core testing for PCB to evaluate DNAPL presence, groundwater sampling, and visual observations of DNAPL presence/absence) allowed for the determination of the approximate extent of contaminant migration in the bedrock in this area. ***(See Figure 2).*** In general, the available data indicate that the bedrock contaminant plume extends approximately 700 meters south, 200 meters west, and 400 meters east from the outfall location. The overall movement of groundwater in the area is south roughly along the line of the regional discharge location (the Hudson River) and upward into the river.

Table #1: Groundwater

Constituent	Concentration Range Detected (a)	SGC (b)	Frequency Exceeding SCG
VOCs			
Chlorobenzene	ND - 2.33	5	< 10% exceeded
Chloroform	ND - 15.7	7	< 10% exceeded
1,2-dichlorobenzene	ND - 2.6	3	< 10% exceeded
1,3-dichlorobenzene	ND - 17.7	3	< 10% exceeded
1,4-dichlorobenzene	ND - 19.7	3	< 10% exceeded
Cis-1,2-dichloroethene	ND - 97.5	5	< 10% exceeded
Trans-1,2-dichloroethene	ND - 7.09	5	< 10% exceeded
Toluene	ND - 117	5	< 10% exceeded
1,2,3-trichlorobenzene	ND - 13.2	5	< 10% exceeded
1,2,4-trichlorobenzene	ND - 80.4	5	< 10% exceeded
Trichloroethene	ND - 11.8	5	< 10% exceeded
Vinyl Chloride	ND - 63.5	2	< 10% exceeded
SVOCs			
Acenapththene	ND - 121	20	< 10% exceeded
Bis (2-ethlyhexly)phthalate	ND - 4720		< 10% exceeded
PCBs			
Total PCB	ND – 42,400	0.090	>90% exceeded

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).

Based on the findings of the RI, the presence of PCB DNAPL in the bedrock has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are: Total PCBs, chlorinated solvents (trichloroethylene trans-1,2-dichloroethane, vinyl chloride), chlorinated benzenes, phthalates, and toluene.

Soil

OU5 deals with the bedrock therefore no site-related soil contamination was investigated during the RIso no remedial alternatives need to be evaluated for soil.

Surface Water

The investigation of contaminants in the bedrock was supplemented by the sampling of surface water and biota in the Hudson River. Surface water was sampled upstream of the former outfall location, immediately adjacent to the outfall location, and downstream of the outfall location. ***(See Figure 3).*** PCB concentrations were typically low to non-detect, but the detections were in excess of applicable standards. The overall pattern indicates that the site is likely still a minor source of PCBs to the Hudson River potentially important at a local scale, but no longer a significant major source of PCBs to the Hudson River at large. It is anticipated that further reductions in PCB concentrations over time will occur as the bedrock conditions improve.

Sampling of aquatic biota was undertaken by the Department at several locations near and at the site. The organisms collected were primarily aquatic invertebrates, with some smaller fish collected. The PCB concentrations were typically higher near, and lower away from, the outfall area**.**

Table #2 - Surface Water

Constituent	Concentration Range Detected(a)	SCG(a)(b)	Frequency Exceeding SCG
Total PCB	**ND to 0.346**	**0.000001 / 0.00012***	**43/165****

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b-SCG: Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1) and 6 NYCRR Part 703: Surface Water and Groundwater Quality Standards.
*Standards to protect human fish consumers / pisciverous wildlife
**Detection limit exceeds SCG

Based on the findings of the Remedial Investigation, the presence of PCB DNAPL in bedrock has resulted in the contamination of surface water. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of surface water to be addressed by the remedy selection process are, Total PCB.

Sediments

Relative to OU5, no site-related sediment contamination of concern was investigated during the RI. Therefore, no remedial alternatives need to be evaluated for sediment.

Exhibit B

Description of Remedial Alternatives

Note: No remedial alternative was available to restore the site to predisposal conditions or to comply with SCGs. Given the nature of the contaminant (a dense, nonaqueous phase liquid of low solubility which is stable in the subsurface) and the nature of the bedrock at the site (fractured and faulted bedrock), there is no currently available technology which would be anticipated to allow for achieving SCGs in the forseeable future. As a result, compliance with SGCs is technically impracticable from an engineering perspective. One of the elements of the periodic reviews performed as an element of site management will be an evaluation of available technologies to determine if a feasible remedial alternative can be identified to achieve SCGs.

Alternative 1: No Further Action

The No Further Action Alternative recognizes the remediation of the site completed through performance of the DNAPL recovery program during the RI. This alternative leaves the site in its present condition and does not provide any additional protection of the environment.

This alternative provides for an assessment of the environmental conditions if no remedial actions are taken. Under Alternative 1, DNAPL collection would be discontinued, as would the ongoing DNAPL, surface water, and groundwater monitoring programs. Natural attenuation of DNAPL would also occur under this alternative, though no monitoring components are included to assess it.

Alternative 2: Site Management

Alternative 2 is an institutional controls/limited actions alternative. Alternative 2 would include routine DNAPL, surface water, aquatic biota, and groundwater monitoring; a notice of environmental conditions; site management plan; and periodic site reviews. DNAPL collection would be discontinued. Natural attenuation would also occur. The effectiveness of natural attenuation would be monitored with data obtained through the monitoring program.

This alternative would include:

Remedial Design: A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and 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 gases 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;
- Maximizing habitat value and creating habitat when possible;

- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

Institutional Control: The overall GE Fort Edward plant site has an existing notice in deed which addresses future use of the overall site. In addition to this instrument, an additional control, in the form of an Environmental Easement, will be required for Operable Unit 05 which:

- requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allows the use and development of the controlled property for commercial and industrial uses 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;
- notifies off site property owners within the geographic scope of Operable Unit 05 that the bedrock groundwater is the subject of a hazardous waste remedial program under State law, and that the bedrock groundwater should not be used, including tracking future ownership and notification of future property owners;
- requires compliance with the Department approved Site Management Plan.

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

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

Institutional Controls: The overall GE Fort Edward plant site property, a portion of which is within the geographic scope of Operable Unit 05, has an existing notice in deed which addresses future use of the overall site, will be supplemented by an Environmental Easement as discussed above. The site management plan will also include those elements identified above for periodic certification, land use restriction, water use restrictions, and property owner tracking and notification.

Engineering Controls: Installation of additional monitoring wells, and use of the new and existing wells, for the groundwater monitoring program.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The groundwater, surface water, and biota monitoring network needed will be determined during remedial design. The plan includes, but may not be limited to: monitoring of DNAPL, groundwater, surface water, and biota to assess the performance and effectiveness of the remedy; a schedule of monitoring and frequency of submittals to the Department;

c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to: maintaining the needed monitoring wells, maintaining site access controls and Department notification; and providing the Department access to the site and O&M records.

Groundwater contamination (remaining after active remediation) will be addressed with monitored natural

attenuation (MNA). Groundwater will be monitored for site related contamination and also for MNA indicators which will provide an understanding of MNA processes. It is anticipated that contamination in the groundwater and/or surface water will decrease by an order of magnitude in a reasonable period of time 5 to 10 years after DNAPL recovery stops. Reports of the attenuation will be provided at 5 year intervals, and active remediation will be proposed if it appears that natural processes alone will not address the contamination and a feasible technology becomes available. The contingency remedial action will depend on the information collected, but it is currently anticipated that an in-situ treatment technology would be the expected contingency remedial action if one can be identified in the future.

Present Worth: *$210,000*
Capital Cost: *$99,600*
Annual Costs: *$1,467,000*

Alternative 3: Continued DNAPL collection, monitoring, and institutional controls

This alternative would include all of the elements of Alternative 2, and will also include the periodic manual collection of PCB DNAPL and associated contaminated groundwater from bedrock wells containing recoverable amounts of DNAPL. This DNAPL would be disposed of at permitted facilities off-site. Groundwater collected during DNAPL collection would be treated at the on-site wastewater treatment plant.

Present Worth: *$210,000*
Capital Cost: *$120,000*
Annual Costs: *$1,722,000*

Exhibit C

Total Present Worth costs represent the current value of capital costs, along with the present value of future costs over time. These future costs could include annual operation, maintenance and monitoring (OMM) of the remedy, as well as periodic (non-annual) costs associated with activities such as remedy reviews. The calculation of total present worth is done in accordance with Federal guidance provided, and is rounded to the nearest thousand.

See Tables 5-1 through 5-4 of the Feasibility Study Report for detailed cost estimate information.

Alternative	**Capital Cost**	**Estimated Annual Costs**	**Total Present Worth**
Alternative 1 – No Further Action	$0	$0	$0
Alternative 2 – Monitoring and Institutional Control	$210, 000	$99,600	$1,467,000
Alternative 3 – Continued DNAPL Collection, Monitoring, and Institutional Control	$210,000	$120,000	$1,722,000

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 3 (Continued DNAPL collection, with offsite disposal of DNAPL and onsite treatment of recovered water), along with monitoring of groundwater, as the remedy for this site. Alternative 3 would achieve the remediation goals for the site by the removal of PCB DNAPL, monitoring, and natural attenuation. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 4.

Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

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.

The proposed remedy (Alternative 3*)* would satisfy this criterion by removing the remaining source of groundwater, surface water, and biota contamination associated with the PCB DNAPL in the bedrock (OU5), along with monitoring the surface water, groundwater and biota, and natural attenuation. Use of institutional controls will address potential exposures. Alternative 1 would not provide protection of human health and the environment and will not be evaluated further. Alternative 2, which does not include DNAPL removal, would be less protective of the environment, as the source of contamination would persist and there would be no abatement of environmental exposure over time as is anticipate with Alternative 3.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

Alternatives 1 and 2 would not achieve SCGs, as the remaining DNAPL in bedrock would continue to result in the SCGs for surface water and groundwater to be exceeded for the foreseeable future. Alternative 3 is not anticipated to achieve SCGs either; however, as the DNAPL is removed, a greater opportunity exists for SCGs to be achieved in the portion of the bedrock aquifer which has not contained DNAPL. (In other words, reducing the DNAPL where possible increases the likelihood that the portion of the rock which never contained DNAPL may eventually meet standards), thus limiting the impacts to the other environmental media and biota.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. 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.

Alternative 3 provides the highest level of long term effectiveness. As stated above, as the DNAPL is removed, a greater opportunity exists for SCGs to be achieved in a larger portion of the bedrock aquifer. Both Alternative 2 and Alternative 3 rely upon monitoring and institutional controls to limit future exposures and related human health and environmental risks.

4. 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 site.

Alternative 3 has a higher degree of reduction in the toxicity, mobility, and or volume of waste, as the DNAPL removal will result in a much higher rate of PCB removal from the site compared to Alternative 2, which would rely solely on MNA.

5. 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 remedial objectives is also estimated and compared against the other alternatives.

Both Alternative 2 and Alternative 3 have limited short-term impacts. Little intrusive construction work would be done under either alternative.

6. 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.

Both Alternatives 2 and 3 are implementable. There should be little difficulty in monitoring the effectiveness of the remedy, except during winter months when site accessibility is at issue. The personnel and equipment are readily available and have been undertaking similar work for years. Implementation of the institutional controls has the same level of difficulties for both alternatives 2 and 3, but is achievable.

7. 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.

The costs of Alternative 2 is similar to Alternative 3. Alternative 3 has higher long-term effectiveness and is therefore more cost effective.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The 004 outfall area (a narrow strip of land at the base of a cliff) is relatively inaccessible and is not useable for residential, commercial, or industrial purposes. The use of surrounding properties underlain by the deep bedrock

plume should not be affected, other than by a restriction in groundwater use. The site vicinity is already served by municipal water.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes

Alternative 3 is being proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.

Figure 1: Site Location

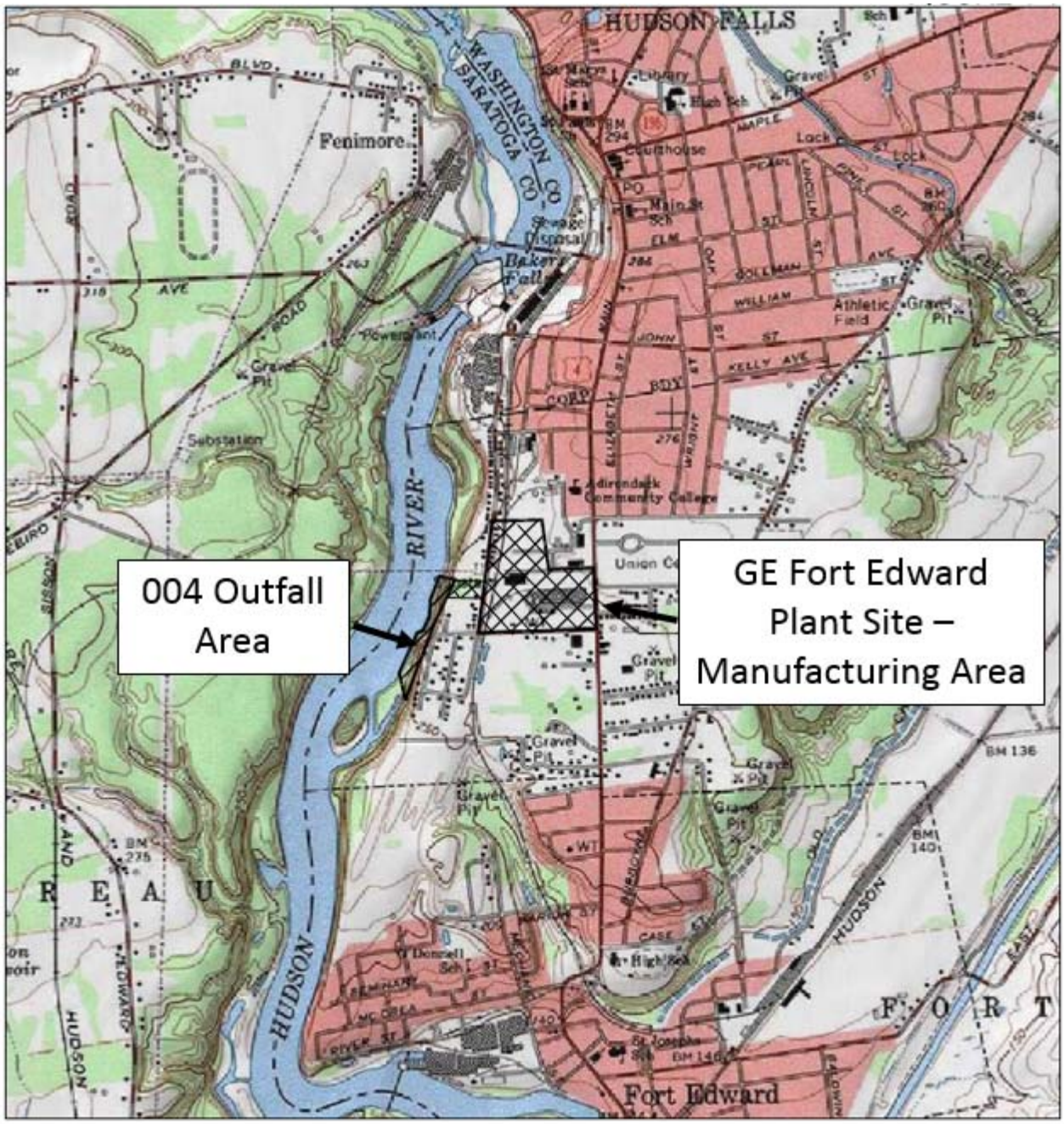


Figure 2: Well Location Map showing approximate plume boundaries

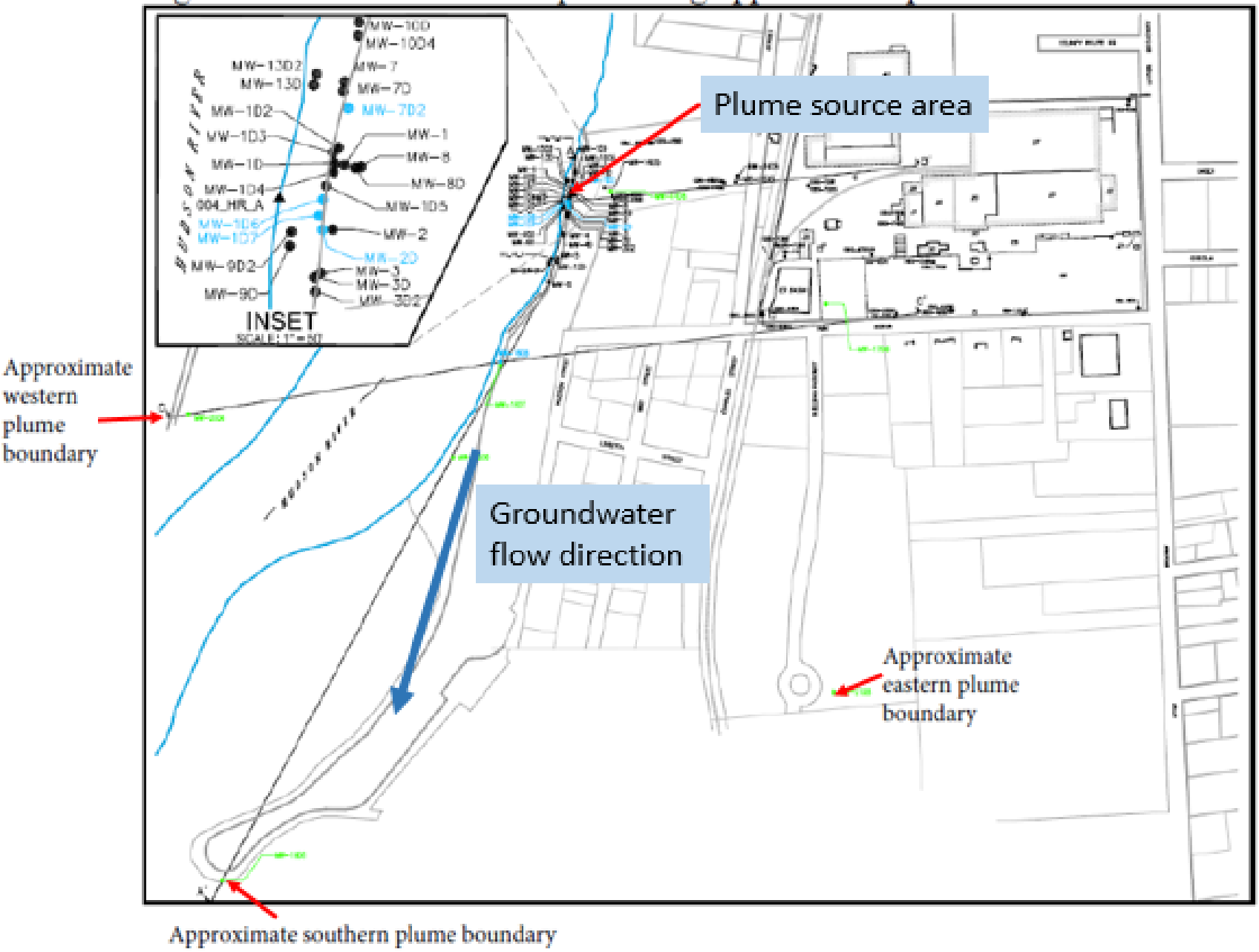
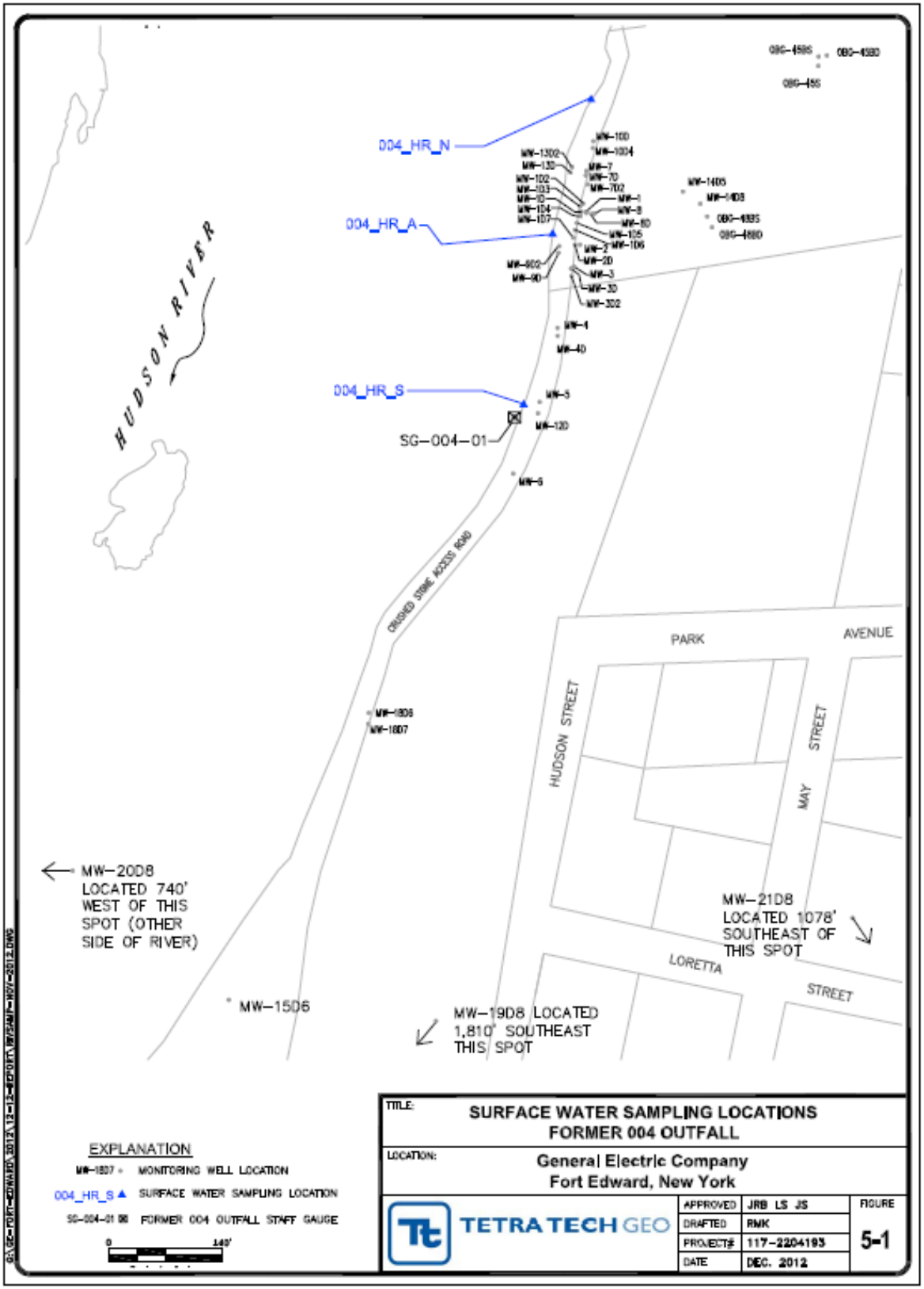


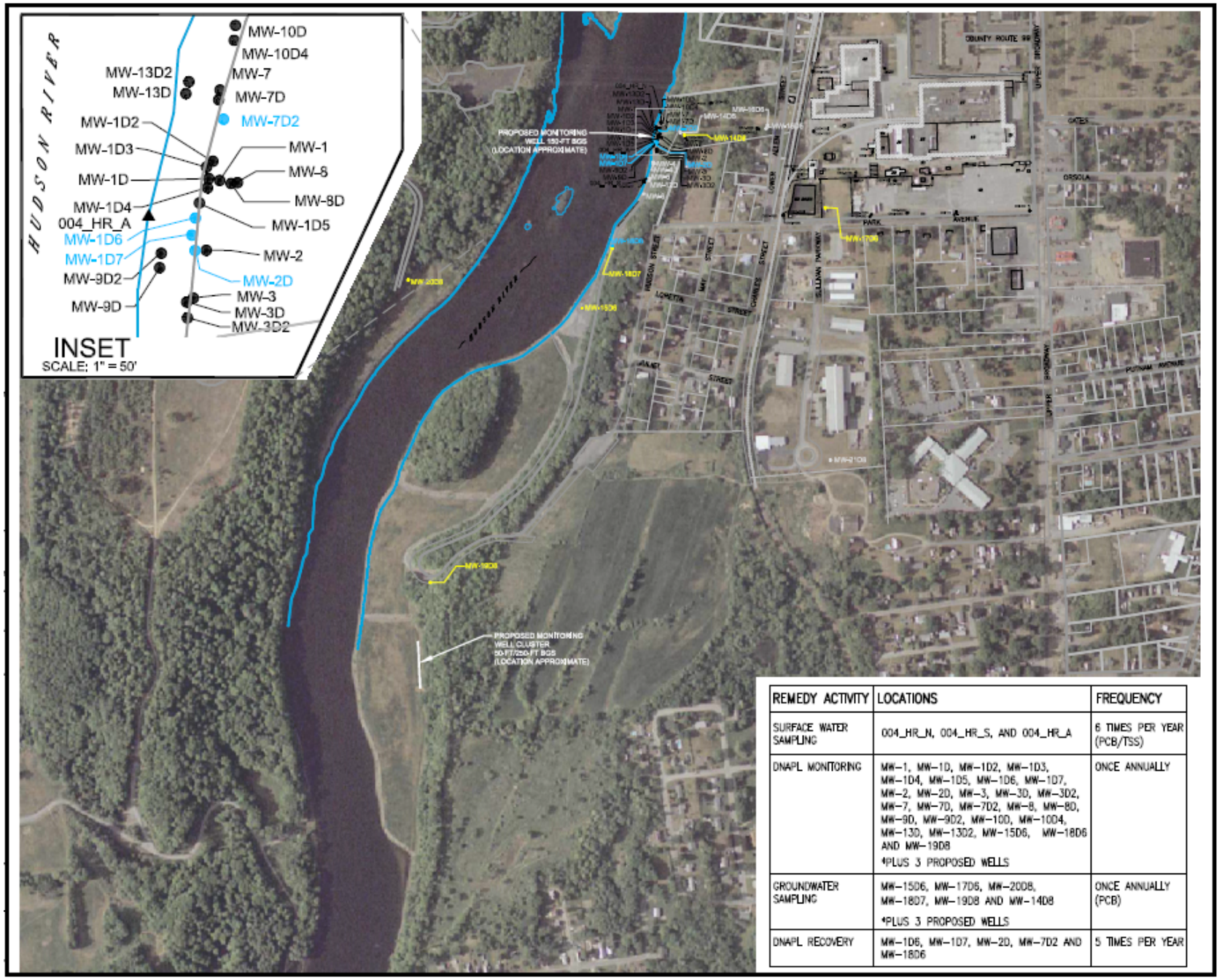
Figure 3: Surface Water Sampling Locations



(From "Remedial Investigation Report - Former 004 Outfall – OU 5" (Dec. 2010, Tetra Tech)

Sampling Locations:
North of outfall – "004_HR_N"; At outfall – "004_HR_A"; South of outfall – "004_HR_S"

Figure 4: Graphic with Proposed Remedy (New well locations to be finalized in design)



REMEDY ACTIVITY	LOCATIONS	FREQUENCY
SURFACE WATER SAMPLING	004_HR_N, 004_HR_S, AND 004_HR_A	6 TIMES PER YEAR (PCB/TSS)
DNAPL MONITORING	MW-1, MW-1D, MW-1D2, MW-1D3, MW-1D4, MW-1D5, MW-1D6, MW-1D7, MW-2, MW-2D, MW-3, MW-3D, MW-3D2, MW-7, MW-7D, MW-7D2, MW-8, MW-8D, MW-9D, MW-9D2, MW-10D, MW-10D4, MW-13D, MW-13D2, MW-15D6, MW-18D6 AND MW-19D8 *PLUS 3 PROPOSED WELLS	ONCE ANNUALLY
GROUNDWATER SAMPLING	MW-15D6, MW-17D6, MW-20D8, MW-18D7, MW-19D8 AND MW-14D8 *PLUS 3 PROPOSED WELLS	ONCE ANNUALLY (PCB)
DNAPL RECOVERY	MW-1D6, MW-1D7, MW-2D, MW-7D2 AND MW-18D6	5 TIMES PER YEAR

(Adapted from Figure 6-1 of "Feasibility Study, GE Fort Edward Plant OU-5" (O'Brien and Gere, September 2014)