General Electric Company

Community Air Monitoring Plan

Powerhouse Deconstruction
Hudson Falls, New York

August 2022

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1 Introduction

This Community Air Monitoring Plan (CAMP) presents a program to be implemented in support of National Grid's proposed deconstruction of the former Powerhouse building located on the east bank of the Hudson River in Hudson Falls, New York (the site). The former Powerhouse has been condemned due to the structure's advanced state of deterioration. Details related to the deconstruction activities are presented in the Powerhouse Deconstruction Design Report (Deconstruction Design), to which this CAMP is an appendix. Specification Sections referenced in this CAMP are included in Appendix A to the Deconstruction Design.

The purpose of the community air monitoring program is to confirm that control measures taken during the deconstruction activities effectively protect the surrounding community from potential airborne particulates and vapors. This CAMP summarizes dust and vapor control measures to be implemented by the deconstruction Contractor (Contractor) and the air monitoring procedures, air emission action levels, monitoring schedule, and data collection and reporting to be performed by the Engineer (who provides oversight of the deconstruction and protective measure activities) during the deconstruction. The CAMP has been prepared considering the New York State Department of Health (NYSDOH) Generic CAMP (Attachment 1) as well monitoring programs approved by the New York State Department of Environmental Conservation (NYSDEC) to support General Electric Company's (GE's) soil remediation and building demolition activities at the GE Hudson Falls Site between 2017 and 2018.

The CAMP is intended to be a discrete program that will be operated in conjunction with the exclusion zone (work zone) air monitoring program conducted by the Contractor for worker protection. The Engineer will provide all labor, materials, and equipment necessary to implement the community air monitoring program specified herein. The Contractor is ultimately responsible for confirming that all corrective measures associated with the community air monitoring program are conducted in accordance with this CAMP and Section 01 57 05 – Temporary Controls.

1.1 Site Location and Description

The Powerhouse is located along the Hudson River in the Village of Hudson Falls, Washington County, New York. The National Grid property where the Powerhouse is located is bordered by the Hudson River to the west, a commercial property to the south, and GE property to the east. The Bakers Falls dam is located immediately north of the Allen Mill and a private hydroelectric facility is located along the western shore of the Hudson River, immediately west of the Allen Mill.

The Powerhouse is located within an NYSDEC environmental remediation site that has been and continues to be addressed by GE, with NYSDEC oversight. Certain at- and below-grade portions of the Powerhouse and adjacent/nearby soil and bedrock may contain polychlorinated biphenyls (PCBs) and/or dense non-aqueous phase liquids (DNAPL) related to GE's former operations at its adjacent Hudson Falls property. Therefore, in addition to dust monitoring (as typical for deconstruction projects), airborne PCB sampling and vapor monitoring will be performed to assess air quality between the Project Work Limits and surrounding community.

1.2 Summary of Deconstruction Activities

Deconstruction activities will be performed under the United States Environmental Protection Agency's (USEPA's) Administrative Settlement Agreement and Order on Consent for Removal Action (AOC; USEPA, 2022) Index Number CERCLA-02-2022. Details related to the deconstruction activities are presented in the Deconstruction

Design. The Powerhouse deconstruction will include the removal of the structure, including interior and exterior walls, the roof system, structural steel, concrete supports, the main floor concrete slab to the top of penstock outfalls, equipment, and other ancillary items. Additionally, deconstruction activities may include minor intrusive earthwork (e.g., excavation and backfilling as necessary to complete the deconstruction activities, provide stable slope conditions, and complete upland area restoration). An estimated 5,100 tons of material will be removed during the deconstruction activities.

2 Potential Air Emissions and Control Measures

As defined in the NYSDOH Generic CAMP (included as Attachment 1), ground-intrusive activities (as well as deconstruction activities) have the potential to generate localized impacts to air quality. Building deconstruction components that have the potential to generate air emissions include, but may not be limited to, the following:

- Installing erosion and sediment controls and other site preparation activities.
- Removing trees and vegetation around the former Powerhouse and project area, as needed (stumps and roots are anticipated to remain in-place).
- Excavating and handling soil.
- Removing the former Powerhouse structure in a controlled manner (i.e., building deconstruction).
- Handling material (e.g., transferring building debris to on-site staging areas, stockpiling of materials, interim storage prior to load-out, and loading of materials for transport to an off-site treatment/disposal facility or recycling facility as identified in the Deconstruction Design).
- Characterizing building materials to facilitate disposal (as necessary).
- Restoring excavation and support areas.
- Construction traffic/transportation.
- Other ancillary intrusive activities.

In addition to Contractor means and methods focused on minimizing dust generation, the following construction techniques and site management practices will also be used to mitigate dust, PCB, and vapor emissions in ambient air:

- Removing, handling, loading, and unloading building debris, excavated soil, and clean fill, in a manner that minimizes the generation of airborne dust.
- Using water sprayers to wet building materials, excavation faces, and other sources of dust or vapors.
- Using a water truck and/or other portable application means (e.g., towable water tank with sprayer pump) to apply water to haul roads.
- Restricting vehicle speeds on temporary access roads and active haul routes.
- Covering loads during transport to staging areas.
- Covering material stockpiles with polyethylene liners (anchored appropriately to resist wind forces) before extended work breaks and at the end of each workday.
- Complying with applicable erosion and sediment control requirements of Section 01 57 05 – Temporary Controls.
- Complying with cleaning requirements of Section 01 74 05 – Cleaning.

Water sprayers and ancillary equipment will be mobilized before any intrusive or dust-generating activities are initiated and will be maintained in sufficient supply throughout the project. Water from a nearby water hydrant (e.g., along Sumpter Street) will be the primary source of water onsite. Portable water sprayers, such as cannons and misters, will be used during deconstruction activities. Additionally, laborers with water hoses and appropriate nozzles will provide supplemental dust support, as needed. The dust controls will be strategically placed and relocated as needed throughout the deconstruction work area. Effective control of airborne particulates and related monitoring will beneficially affect the presence and control of possible PCBs and vapors in ambient air.

The air monitoring described in the CAMP will be used to verify the general effectiveness of the routine control measures. Based on review of the monitoring results, meteorological data, and ongoing activities, work-practices may be adjusted and/or additional mitigating measures may be implemented (including the possible cessation of all or portions of ongoing project activities).

3 Air Monitoring Summary

As previously indicated, dust monitoring, vapor monitoring, and airborne PCB sampling and analysis will be performed to assess air quality at or in the vicinity of the Project Work Limits. Fugitive dust migration will also be visually assessed during all work activities, and reasonable dust-suppression techniques will be used during any site activities that may generate fugitive dust, as described in Section 2.0 above. Additionally, meteorological monitoring will be performed as described in Subsection 3.4.

As required by the NYSDOH Generic CAMP, real-time ambient air monitoring activities for airborne particulate matter less than ten microns in diameter (PM_{10}) will be conducted continuously during intrusive and/or potential dust-generating activities (e.g., demolition, excavation, backfilling, and material handling activities), except during periods of precipitation that would otherwise result in unreliable data or damage to the monitoring equipment.

PCB and vapor air monitoring will be performed when project activities may involve contact with and on-site management of potential PCB-impacted materials (as designated in the Deconstruction Design, or as warranted based on other considerations related to possible presence of PCBs in ambient air). The program will continue daily (anticipated to be five days per week, coinciding with site activities) until the load-out of PCB-containing materials for off-site disposition is completed.

Note that ambient air monitoring for vapors is included in this CAMP to be consistent with the NYSDOH's Generic CAMP. Based on vapor monitoring performed during multiple GE remedial projects at the Hudson Falls Site (including projects where elevated levels of volatile organic compounds and DNAPL were present and encountered in soils, bedrock, and groundwater), ambient air monitoring did not detect vapors above the corresponding action levels and did not affect ambient air quality or impede project activities. Therefore, when considering the nature and extent of the impacts associated the deconstruction project, a similar lack of airborne vapors is anticipated. If elevated levels of vapors are detected, GE will propose to EPA an approach to evaluate the vapors in more detail, including their source. Further, it is expected that real-time monitoring for particulates and the analytical results for PCBs in ambient air will provide the necessary data to assess and manage the project considering potential ambient air quality concerns.

3.1 Monitoring Location Selection

Monitoring locations have been selected considering the project scope, site conditions, and potential off-site receptors. Given the limited access and space available in the immediate work area at the site, monitoring

stations are anticipated to be installed at the locations shown on Figure 1. These locations surround the entire work area and will be designated as upwind and downwind locations, based on real-time meteorological data. For each potential wind direction, upwind and downwind designations are presented in Table 1. The PM_{10} monitoring stations are generally positioned closer to active construction activities to provide real-time assessment of potential ambient air quality corresponding to ongoing project activities. The three PCB monitoring stations are positioned between the project work limits and surrounding community areas; one of the PCB and vapor monitoring stations (station RES-1) has been used as a monitoring location for several remedial and monitoring activities performed by GE (e.g., soil remediation, building demolition, entry of the Tunnel Drain Collection System). When deconstruction activities may encounter DNAPL (e.g., removal of subgrade portions of the former Powerhouse), PCBs and vapors will be monitored at a fourth station located at the public boat launch located across the Hudson River.

The wind direction, including changes throughout the day, will be monitored based on data from the on-site meteorological monitoring station and noted in the field logbook. The stations shown on Figure 1 may be modified (with USEPA concurrence) based on the actual site layout, anticipated work activities, wind direction, prior monitoring data, and site observations. The number of stations for each analyte type is presented in Table 3-1 below:

Table 3-1 – Number of Air Monitoring Stations

Station Count	
Meteorological	1
PM_{10} / Dust	6
Vapors	3 or 4*
PCBs	3 or 4*

Note: * = PCB sampling and vapor monitoring will occur at the public boat launch located across the Hudson River, due west of the Powerhouse when deconstruction activities may encounter DNAPL (i.e., during removal of the below-grade portions of the structure).

3.2 Air Monitoring Equipment and Procedures

Monitoring for PM_{10}, vapors and PCBs will be performed using the following portable equipment (or equivalent):

- PM_{10} / Dust – DustTrak II Aerosol Monitor Model 8530 by TSI, Inc., or equivalent.
- Vapors – RAE MiniRAE 2000 photoionization detector fitted with a 10.6 eV lamp, with operating/recording software.
- Ambient air PCBs – sampling pump, sampling cartridge, and polyurethane foam (PUF) cylinders.
- Portable Meteorological Monitoring System – Wireless Vantage Pro2 by Davis Instruments Corporation, Inc. or equal.
- Environmental enclosure with audible and visual alarms for PM_{10}, vapor monitors (tripod mounted).
- Wireless communications to phones, beepers, or radios for vapor alarms.

Real time PM_{10} and vapor monitoring will be conducted using instrumentation equipped with electronic data-logging capabilities. All time-weighted average (TWA) concentrations (calculated for continuous 15-minute

increments [e.g., 08:00 to 08:15, 08:15 to 08:30]) and any instantaneous readings taken to assess an appropriate course of action will be recorded using an electronic data logger and/or in the field logbook. Each piece of monitoring equipment will have alarm capabilities (audible and/or visual) to indicate exceedances of the action levels. Additionally, the equipment will be equipped with a telemetry package to wirelessly communicate alerts to phones, beepers, or radios. Calibration of the instrumentation will occur in accordance with each of the equipment manufacturer's requirements. Measures to protect the field equipment during periods of heavy precipitation will be implemented, as needed. Instrument readings, field reference checks, and calibrations will be recorded in the field logbook.

Ambient air sampling for PCB analysis will be conducted in accordance with USEPA Compendium Method TO-10A, consistent with the approach that has been used for the remedial work performed at the Hudson Falls Site under the direction of the NYSDEC. Initially, ambient air will be pumped through a granular sorbent media filter and PUF filter for a 24-hour sample collection period and both filters will be submitted for laboratory analysis for PCBs. However, PCB air monitoring performed as part of GE's past remedial activities at the Hudson Falls site identified that PCBs were only detected in the PUF sample, so a similar condition is expected during the deconstruction project. As such, PCB analysis of both filters will be performed for approximately one week, after which time (and assuming that conditions similar to past monitoring results are present), only the PUF filter will be used for sample collection and submitted for laboratory analysis for PCBs. Laboratory analysis of PCB samples will be performed in an expedited manner, targeting a 3-business-day turnaround time (TAT) from sample receipt at the laboratory. Depending on the results, and in consideration of the planned work activities, a proposed modification to the TAT for PCB analysis (e.g., 5 days) will be presented to USEPA for approval.

3.3 Action Levels

Action levels for real time PM_{10} and vapors will be based on 15-minute time-weighted averages (TWA) and the difference between upwind and downwind locations. Threshold levels for PCBs will be based on laboratory analytical results. Action levels for ambient air monitoring are detailed in Sections 3.3.1 through 3.3.3 and summarized in Table 3-2 below:

Table 3-2 – Action Levels

Parameter	Action Level	Response
PM_{10} / Dust	≥100 µg/m^3 >UW Station	Employ Additional Mitigation Controls
	≥150 µg/m^3 >UW Station OR Visible Dust Leaving Site	Notify Regulators Onsite Immediately[1] and Send Written Notice within 2 Hours; Stop Work/Change Work Activities
Vapors	≥5 ppm >UW Station	Notify Regulators Immediately[1] and Send Written Notice within 2 Hours; Stop Work/Change Work Activities

[1] Once the exceedance has been wirelessly transmitted to the Engineer, he/she will notify the Contractor to stop work. The Engineer will discuss the situation with the Contractor (and regulators, if onsite) and work together to identify the cause and adjustments/corrective actions to be made to address the exceedance and allow work to continue.

Parameter	Action Level	Response
PCBs	≥0.08 µg/m^3	Notify Regulators Following Receipt of Lab Report; Employ Additional Mitigation Controls
	≥0.11 µg/m^3	Notify Regulators Following Receipt of Lab Report; Stop Work/Change Work Activities

Table Abbreviations:

Regulators = NYSDOH, NYSDEC and USEPA.
≥ = greater than or equal to (i.e., includes all higher readings).
>UW = greater than upwind.
µg/m^3 = micrograms per cubic meter
ppm = parts per million.

3.3.1 PM_{10} / Dust and Vapor Action Levels

As outlined in the NYSDOH Generic CAMP, if a downwind ambient air 15-minute TWA concentration for PM_{10} exceeds **100 µg/m^3** greater than the corresponding upwind 15-minute TWA, the potential source of the exceedance will be identified (if possible) and additional dust controls shall be deployed. However, work can continue. In this scenario, demolition techniques and/or other dust-generating project activities will be modified to abate emissions.

If a downwind ambient air concentration for PM_{10} exceeds **150 µg/m^3** greater than the corresponding upwind 15-minute TWA[2], or visible dust is observed leaving the work area, the Contractor shall stop all work activities. The Engineer will immediately notify National Grid and GE, and the Contractor will identify the source of elevated PM_{10} concentrations, complete corrective actions to reduce or abate the emissions, and identify modifications to construction techniques, as necessary. The Engineer will continue air monitoring. Work activities may resume provided that the 15-minute TWA concentration remains below the action levels and dust is not observed outside of the work area.

If the total vapor concentration in ambient air at a downwind station is more than **5 parts per million (ppm)** above the concentration at the upwind location for the 15-minute average[2], work activities will be halted, air monitoring will continue, potential source(s) of the elevated concentrations will be identified, corrective actions will be taken, and construction activities may continue once the 15-minute average vapor concentration remains less than 5 ppm above upwind concentrations.

In the event of exceedances requiring notification as indicated in Table 3-2, the onsite regulators will be notified immediately[1] about the exceedance. If no one from USEPA, NYSDEC, or NYSDOH is onsite, the Engineer will notify USEPA office-based personnel as soon as possible to participate in a discussion of the exceedance, including the monitoring results, project activities, and site conditions corresponding to that sampling period of interest, temporal and spatial sampling results, and potential follow-up actions/modifications to work activities to address the exceedances. The Engineer will send written documentation about the exceedance and proposed follow-up actions to the USEPA within two hours of the exceedance being identified.

[2] Adjustments to either the PM_{10} or total vapor action levels listed above based on the background (upwind) PM_{10} and total vapor concentrations (which are determined through real-time upwind monitoring) will be contingent upon USEPA review and approval. The action levels for PM_{10} and vapors need to remain flexible in the unlikely event that uncharacteristically poor air quality is observed at the upwind monitoring stations on any given day.

3.3.2 PCB Action Levels

The PCB threshold levels for this CAMP (below) are consistent with the concentrations that have been used during prior soil and building deconstruction activities performed by GE at the Hudson Falls Site. These thresholds originate from the Hudson River PCBs Superfund Site Quality of Life Performance Standards document (QoL) prepared in May 2004. The performance standards considered risk calculations developed using information from the USEPA's consensus database for toxicity information, the Integrated Risk Information System (IRIS), and thresholds established for other projects. To provide protection from both cancer risk and non-cancer hazard, a 24-hour standard was established for daily monitoring. The threshold levels (below) align with the most protective exposure scenario considered in the QoL – i.e., residential areas or places where children may be present for extended periods of time, non-cancer health effects specific for Aroclor 1016, and a child receptor 0- to 6-years old (child/residential-based QoL performance standard).

If PCB analytical results are at or above **0.080 µg/m^3**, established as approximately 80% of the residential/child-based QoL performance standard, the USEPA, NYSDEC, and the NYSDOH will be promptly notified to discuss the sampling results, project activities, and site conditions corresponding to that sampling period of interest, temporal and spatial sampling results, and potential follow-up actions, including expedited laboratory analysis for pending and future samples. Results greater than this Control Level do not require stoppage of ongoing Project activities.

If PCB analytical results are at or above **0.110 ug/m^3** (the residential/child-based QoL performance standard), intrusive project activities will be halted, followed by evaluation and possible implementation of additional mitigation measures. In addition, results above this level will prompt notification to USEPA, NYSDEC and NYSDOH and a similar discussion of relevant information for that sampling period. Project activities can proceed if USEPA and NYSDEC/NYSDOH concur that either of the following conditions is applicable:

- Subsequent to the sampling period corresponding to the sample result above the Site Perimeter Level, additional targeted and tangible mitigation measures have been implemented for the area/activity of concern, and current conditions and information suggest that ongoing work is not likely causing concentrations above the action level; or
- The nature, type, location, and/or circumstances of the current actions are notably different from those associated with the sampling period corresponding to the sample result above the Site Perimeter Level, such that ongoing work is not likely to result in concentrations above the action level.

3.4 Meteorological Monitoring

Meteorological monitoring will be conducted continuously at the site using a portable meteorological monitoring system. The meteorological monitoring system will be deployed in accordance with existing criteria established by the USEPA and NYSDEC for meteorological monitoring systems (*Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV – Meteorological Measurements Version 2.0 [Final]*, dated March 2008; and New York State Policy DAR-2: "*Oversight of Private Air Monitoring Networks*," revised and effective August 31, 2013). Use of these guidelines enables the meteorological monitoring system to provide representative observations of the local meteorological conditions. The meteorological station will be attached near the top of the flagpole visible from the corner of Allen and John Street, as shown on Figure 1, or other appropriate location. The station will be installed approximately 10 meters above ground surface.

A digital meteorological monitoring system will be used to collect the data. At a minimum, the meteorological monitoring system will monitor wind speed, wind direction, relative humidity, and ambient temperature. Meteorological monitoring data will be recorded and archived electronically and will be available for review (e.g., the meteorological monitoring system will be equipped with electronic data-logging capabilities). Readings will be available throughout the workday to determine if there is a change in wind direction.

4 Monitoring Schedule and Reporting

Prior to starting ground intrusive or potential dust generating activities, one week of air monitoring will be conducted to establish adequate baseline data (i.e., to document airborne particulate, vapor levels, and PCB concentrations at or near the site). Air monitoring for particulates will be performed during the deconstruction project until such time that significant potentially dust-generating project-related activities are complete including load-out of debris for offsite disposition. PCB and vapor monitoring will be performed when project activities will encounter potentially PCB-impacted materials and will continue until all PCB-containing debris is removed from the site.

The frequency of air monitoring will be relative to the level of site work activities being conducted and may be adjusted as the work proceeds and in consideration of the monitoring results, with USEPA approval. Meteorological monitoring will be performed continuously during work activities.

In the event of an exceedance of PM_{10} or total vapor action levels requiring Stop Work/Change Work Activities, the Engineer will notify the Contractor to stop work. The Engineer will discuss the situation with the Contractor (and regulators, if onsite) and work together to identify the cause and adjustments/corrective actions to be made to eliminate the exceedance and allow work to continue.

The Engineer will prepare a daily summary of the 15-minute average dust and vapor air monitoring results and a summary of the 24-hour PCB air sampling results (as results are received from the laboratory). The summaries will also include, but not be limited to, a description of community air monitoring exceedances (if any), work activities associated with the exceedances, and corrective actions implemented to address the exceedances. The dust and vapor monitoring and PCB sampling results will be summarized during the weekly demolition coordination meetings and attached to the weekly meeting minutes, which will be distributed to the USEPA and NYSDEC/NYSDOH. A copy of the data will be maintained at the Engineer's field office trailer.

Table

Table 1
Upwind and Downwind Designations

Community Air Monitoring Plan
Powerhouse Deconstruction, Hudson Falls, New York

Wind Direction From	Designated Upwind Monitoring Station(s)	Designated Downwind Monitoring Station(s)
North	F	B, C
Northeast	F	A, B
East	E, D	A
Southeast	C, D	A
South	B, C	F
Southwest	A, B	F
West	A	E, D
Northwest	A	C, D

Figure

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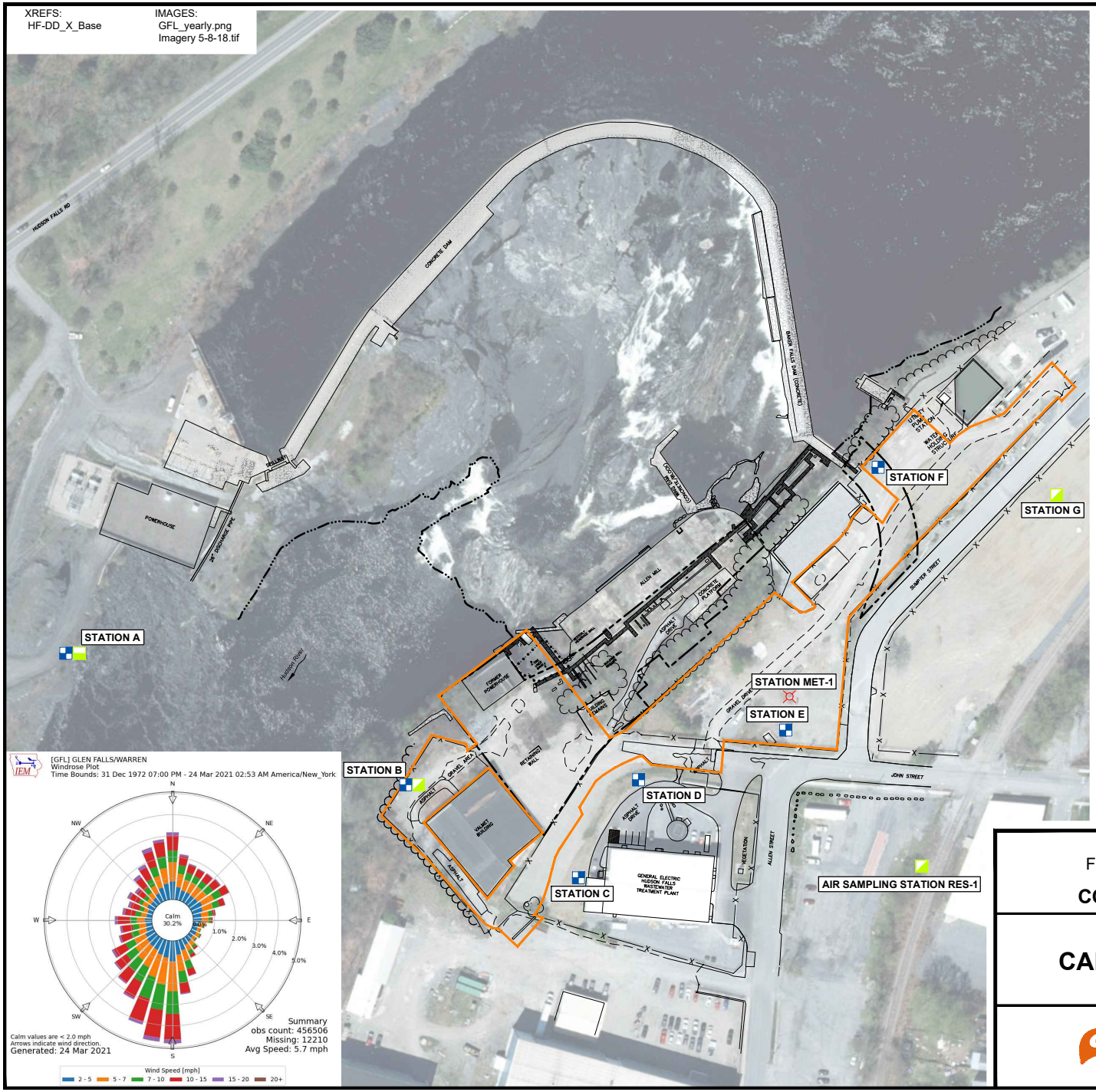

LEGEND:

- DECONSTRUCTION WORK LIMITS
- PROPERTY LINE
- BUILDING
- CHAIN LINK FENCE
- CONCRETE
- WOOD BOARD WALK
- APPROXIMATE EXTENT OF TIRE-LINED BANK
- EDGE OF GRAVEL
- EDGE OF VEGETATION
- EDGE OF WATER
- PARTICULATES (PM_{10}) MONITORING LOCATION
- PCB AND VAPOR MONITORING LOCATION
- PCB AND VAPOR MONITORING LOCATION WHEN DECONSTRUCTION ACTIVITIES MAY ENCOUNTER DNAPL
- METEOROLOGICAL MONITORING LOCATION (ATTACHED TO FLAGPOLE)

TRUE NORTH

NOTES:

1. IMAGERY OBTAINED FROM ESRI ONLINE SERVICES. DATED 5/8/2018.
2. CAMP MONITORING LOCATIONS TO BE ADJUSTED BASED ON WIND DIRECTION.
3. WIND ROSE OBTAINED FROM CLIMATE.GOV ON 7/21/21.
4. PM_{10} = PARTICULATE MATTER LESS THAN TEN MICRONS IN DIAMETER.
5. PCB = POLYCHLORINATED BIPHENYLS.
6. DNAPL = DENSE NONAQUEOUS PHASE LIQUID.

0 100' 200'
GRAPHIC SCALE

NATIONAL GRID
FORMER POWERHOUSE AND ALLEN MILL
HUDSON FALLS, NEW YORK
COMMUNITY AIR MONITORING PLAN

CAMP MONITORING LOCATIONS

ARCADIS

FIGURE
1

Attachment 1

Generic Community Air Monitoring Plan

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. APeriodic@ monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

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