STANDARD OPERATING PROCEDURES FOR RESPONSES AND NOTIFICATIONS TO ACTION LEVEL EXCEEDANCES AREA 1, PHASE 1 DEVELOPMENT

Baltimore Works Site

Baltimore, Maryland

March 2014

By:
Environmental Resources Management Inc.
Harbor Point Development LLC

For:
U.S. Environmental Protection Agency – Region III
Maryland Department of the Environment

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LIST OF ACRONYMS

BTV – Background Threshold Value

COC – Contaminant of Concern

CSSA – Cover Soil Stockpile Area

CrVI – Hexavalent Chromium

° C – Degrees Celsius

° F – Degrees Fahrenheit

DDP – Detailed Development Plan

EPA – U.S. Environmental Protection Agency

ERG – Eastern Research Group

ERS – Environmental Remediation System

HMS – Head Maintenance System

Lpm – Liters per Minute

LSC – Layered Soil Cap

M^3 – Cubic Meters

MDE – Maryland Department of the Environment

mg – Milligram

MMC – Multimedia Cap

NAAQS – National Ambient Air Quality Standard

NOAA – National Oceanic and Atmospheric Association

ŋg – Nanogram

NWS – National Weather Service

LIST OF ACRONYMS (continued)

OAM – Offsite Air Monitor

PAM - Perimeter Air Monitoring

PVC – Polyvinyl Chloride

RAM – Real-time Aerosol Monitor

RH – Relative Humidity

SAP – Sampling and Analysis Plan

STEL – Short-Term Exposure Limit

SOP – Standard Operating Procedures

QAPP – Quality Assurance Project Plan

Total PM – Total Particulate Matter

µg – Microgram

µm – Micron

USL – Upper Prediction Limit

WZ – Work Zone

1.0 INTRODUCTION

This Standard Operating Procedures (SOP) for Responses and Notifications ("the SOP") has been prepared in support of the approved Detailed Development Plan (DDP) for the Harbor Point Area 1, Phase 1 Development (the "Site", Figure 1). This SOP is to be implemented throughout construction air monitoring. The principal contaminant of concern (COC) is hexavalent chromium (CrVI).

The approved Environmental Remediation System (ERS) is operated and maintained by Honeywell International Inc. (Honeywell) pursuant to the Consent Decree dated April 27, 1989, as amended, among Honeywell, U.S. Environmental Protection Agency (EPA) and Maryland Department of the Environment (MDE) to contain chromium contaminated groundwater and eliminate exposure to impacted soil. The ERS consists of the Multimedia Cap (MMC), Hydraulic Barrier, Head Maintenance System and Outboard Embankment.

1.1 PURPOSE

This SOP is intended to specify the response actions and notifications to be implemented in the event that real-time Total Particulate Matter (Total PM) monitoring during construction intrusive activities indicates an exceedance of the action level established from and based on the Pre-Construction Air Monitoring data. For the purpose of this SOP, "intrusive activities" occur any time there is disturbance of the contaminated soil immediately below the synthetic layers of the existing MMC in Area 1. The project-specific Total PM action level will be subject to refinement throughout the intrusive work, subject to approval by EPA and MDE, and in accordance with the Construction Air Monitoring Plan Area 1, Phase 1 Development, March 2014.

1.2 PROJECT MANAGEMENT

Harbor Point Development, LLC (HPD) is the Developer. ERM is the Developer's environmental consultant (Developer's Representative) responsible for implementing the air monitoring program during construction. EPA and MDE have equal regulatory authority for this project. Key project personnel, regulatory personnel and their contact information are summarized in Table 1.

Table 1. Key Personnel

Name	Project Role	Organization	Address / E-mail / Phone
Russell Fish	Project Coordinator	EPA Region 3	Office of Remediation 3LC20 1650 Arch Street Philadelphia, PA 19103-2029 fish.russell@epa.gov 215-814-3226
Ruth Prince	Technical Lead	EPA Region 3 Alternate	Office of Technical and Administrative Support 3LC10 1650 Arch Street Philadelphia, PA 19103-2029 prince.ruth@epa.gov 215- 814-3118
Edward Dexter	Project Coordinator	MDE	Solid Waste Program 1800 Washington Boulevard, Suite 605 Baltimore, MD 21230-1719 ed.dexter@maryland.gov 410-537-3315
Mark Mank	Technical Lead	MDE Alternate	Solid Waste Program 1800 Washington Boulevard, Suite 605 Baltimore, MD 21230-1719 mark.mank@maryland.gov 410- 537-3493
Jim Leizear	Field Inspector	MDE	Solid Waste Program 1800 Washington Boulevard, Suite 605 Baltimore, MD 21230-1719 jim.leizear@maryland.gov 410-537-3315
Jonathan Flesher	Project Manager	HPD	1300 Thames Street Suite 10 Baltimore, MD 21231 jflesher@beattydevelopment.com 410-332-1100
Chris French	Project Manager	Honeywell International	101 Columbia Road Morristown, NJ 07960 chris.french@honeywell.com 973-455-4131
Lenny Rafalko	Partner-in-Charge	ERM	75 Valley Stream Parkway Suite 200 Malvern, PA 19355 leonard.rafalko@erm.com 484-913-0428

Darren Quillen	Project Manager	ERM	200 Harry S Truman Parkway, Suite 400 Annapolis, Maryland 21401 darren.quillen@erm.com 410-972-0234
Larry Hottenstein	Quality Assurance Manager	ERM	2875 Michelle Drive Suite 200 Irvine, CA 92606 larry.hottenstein@erm.com 949-623-4685
Jeff Boggs	Field Manager	ERM	75 Valley Stream Parkway Suite 200 Malvern, PA 19355 jeff.boggs@erm.com 443-803-8495
Tim Hodges	Project Executive	Armada Hoffler Construction Company (AHCC)	1000 Lancaster Street Suite 430 Baltimore, MD 21202 thodges@armadahoffler.com 410-727-2929
Jeff Ayers	Senior Project Manager	Armada Hoffler Construction Company (AHCC)	1000 Lancaster Street Suite 430 Baltimore, MD 21202 jayers@armadahoffler.com 410-727-2929

Alternate (cell phone) numbers for all key personnel will be provided to the project team members, the list of which will be posted at the Field Manager's office trailer at the site.

2.0 OVERVIEW OF CONSTRUCTION AIR MONITORING

Total PM will be monitored using DustTrak Model 8533 real-time monitors. BGI Model PQ-100 samplers will be used to collect particulate samples for laboratory analyses of CrVI. Detailed descriptions of the air monitoring program are detailed in the following documents:

- Construction Air Monitoring Plan Area 1, Phase 1 Development, March 2014; and
- Air Monitoring Program Quality Assurance Project Plan Area 1, Phase 1 Development Version 1, March 2014 (QAPP), including;
    - Construction Sampling and Analysis Plan (SAP), Appendix A, March 2014;
    - Field Sampling Protocol and Standard Operating Procedure Real-time Air Sampling for Total Particulate Matter in Ambient Air, Appendix B1, March 2014;
    - Field Sampling Protocol and Standard Operating Procedure Sampling of Hexavalent Chromium in Ambient Air, Appendix B2, March 2014; and
    - Standard Operating Procedure for the Preparation and Analysis of Hexavalent Chromium by Ion Chromatography, Appendix C, February 2014.

2.1 CONSTRUCTION MONITORING LOCATIONS

Six fixed (i.e., permanent) monitoring locations will be established for construction air monitoring. The fixed station locations include four perimeter air monitoring (PAM) stations to be located at the Harbor Point construction site: PAM-1 at the eastern property boundary; PAM-2 at the southeastern Area 1 boundary; PAM-3 at the western Area 1 boundary: and PAM-4 at the northern Area 1 boundary (Figure 2). PAM-1 will serve as a co-located monitoring site with two DustTrak monitors and two PQ-100 samplers.

The remaining two fixed monitoring locations will be sited off site, including one monitoring station sited at the Baltimore National Aquarium (OAM-1) and a second off-site monitoring location sited at MDE's Old Town air monitoring site (OAM-2) as shown in Figure 2.

Multiple mobile work zone sampling locations will also be deployed to measure Total PM concentrations daily during construction hours. The number of mobile monitoring locations is dependent on the number of intrusive construction work zones. Each work zone will be monitored by siting a minimum of two real-time monitors immediately adjacent to and downwind of the construction Work Zone intrusive activities. These Work Zone monitors will be repositioned each day as necessary to ensure they are measuring downwind Total PM concentrations.

If the Work Zone excavation footprint is a large area, such as the excavation planned for the moment slab construction, an additional monitor will be deployed to ensure the downwind adjacent vicinity is adequately monitored.

The spatial dimensions of both types of work zones, i.e., the pile driver zone and the moment slab excavation zone and the locations of each DustTrak monitor in relation to the dimensions of each type of work zone, using two locations for the pile driver zone and three for the slab zone are provided in Figure 5 (example used to site the locations; wind from west). The monitor locations will be spaced approximately 50 feet downwind of the Work Zone intrusive construction activities, and approximately 35 feet apart. The daily procedure for establishing the downwind position of the monitors will require that the prevailing wind direction be determined from the on-site meteorological data, prior to intrusive work activities each morning. The on-site meteorological station wind direction will be observed by the Field Manager (as used herein inclusive of a "designee" working under the direction of the Field Manager), approximately every two hours. Should the wind direction shift and become consistent from another direction for two (2) hours, the locations of the monitors will be adjusted accordingly to the new downwind locations.

Additionally, when clean, cover soil removed during construction or imported as clean fill is temporarily stockpiled in the Cover Soil Storage Area (CSSA) as shown on Detailed Development Plan drawing EN1.01, a DustTrak 8533 monitoring station will be established, daily, downwind of the CSSA to monitor Total PM concentrations. The monitoring station will be repositioned each day as necessary to ensure the downwind adjacent vicinity is adequately monitored.

The perimeter and mobile Total PM monitors will be set to sound an audible alarm in the event the Total PM action level is exceeded, providing timely feedback to workers as to when dust levels might require additional controls.

2.2 CONSTRUCTION MONITORING DURATION AND FREQUENCY

Intrusive construction activities are scheduled to be completed over a 25-week duration. The field data objective is to collect daily, continuous real-time Total PM concentration data, and seven (7) CrVI samples (6 primary samplers plus one co-located duplicate) collected over a 24 hour period, plus a field and a trip blank for CrVI, throughout intrusive construction activities. The CrVI sample frequency and duration may be reduced depending on construction progress, field conditions and monitoring results. No modifications to frequency or duration will be made without EPA and MDE approval.

Real-time Total PM monitoring will be performed continuously, 24 hours per day at each fixed monitoring location during intrusive construction workdays. Monitoring will start and end prior to work hours beginning each work day. As such the 24-hour monitor period started prior to work hours on a Friday business day will be recovered on Saturday.

The real-time Total PM monitoring data transmitted by telemetry from the seven (7) fixed stations (inclusive of the primary and duplicate monitors at PAM-1) and the mobile work zone stations will be continuously accessed during construction work hours from the telemetry dashboard operating on the personal computer located in the construction office trailer. The dashboard will be set to send an alert, by e-mail and text notifications, to the on-site ERM Field Manager and Field Technician if any of the fixed or mobile stations measure a 15-minute average Total PM concentration exceeding the established Total PM action level concentration or indicate a malfunctioning unit. Summary Total PM tables will be posted to the project website within two (2) business days of collection.

During the first two weeks of CrVI sampling at each of the fixed monitoring stations, the most rapid laboratory turn-around-time (3 business days) will be requested for the CrVI sample analyses. The CrVI analytical results will be submitted to the agencies as soon as possible, to be followed by the data validation reports as soon as available. The validated CrVI data will be posted to the project website as soon as practicable.

If during this initial two-week period, the CrVI reported concentrations are consistently equal to or less than the background threshold level (BTV) developed using the pre-construction data, the sampling frequency and analytical turn-around-time may be adjusted, subject to EPA and MDE approval.

2.3 MONITORING EQUIPMENT AND METHODS

Each fixed monitoring station will have one DustTrak Model 8533 real-time dust monitor and one BGI Model PQ-100 sample pump. As noted previously, PAM-1 will have duplicate, co-located equipment.

The DustTrak Model 8533 is reported to monitor Total PM concentrations for particles from 0.1 microns up to approximately 15 microns in diameter and uses the terminology of Total PM to describe the measurement. Although not an established Reference Method, the DustTrak Model 8533 has the advantage of providing real-time concentration readings during construction.

The DustTrak Model 8533 will monitor Total PM concentrations and store 1-minute averages on the internal data logger. The Short-Term Exposure Limit (STEL) mode will be set to the project-specific Total PM action level concentration for the mobile work zone monitors, and to the National Ambient Air Quality Standard for PM_{10} of 150 ug/M^3 for the perimeter monitors. The DustTrak flow rate will be calibrated daily and maintained/operated according to its SOP (Appendix B1 of the QAPP).

Concurrently with real-time monitoring for Total PM using the DustTrak 8533 at each location, CrVI concentrations will be determined from 24-hour air samples collected using BGI Model PQ-100 samplers. The perimeter sampler results will be compared to both the pre-construction Background Threshold Value (BTV) for CrVI and the off-site sampler results. The sampler flow rate will also be calibrated daily and maintained/operated in the field according to its SOP (Appendix B2 of the QAPP).

A meteorological monitoring station will be established following EPA siting guidance in EPA-454/B-08-002 *Quality Assurance Handbook for Air Pollution Measurement Systems Volume IV: Meteorological Measurements Version 2.0 (Final),* March 2008. The wind speed and direction sensors for the meteorological monitoring system will be situated approximately 10 meters above ground, mounted to one of the temporary construction office trailers housing the either Field Manager or the General Contractor's representatives.

3.0 DUST CONTROL

Best Management Practices (BMPs) will be used to control dust to the extent practicable. In order of sequencing, the standard operating BMPs will include the following:

- BMP No. 1 - Limiting the size of the open area at any one time during construction. This will serve two purposes:
    - Reduce the area of exposed soil that could be a source of windblown dust; and
    - Assist with storm water management.
- BMP No. 2 – Apply aerosolized water mist downwind of the excavation zone or cover soil stockpile area using potable water as needed to precipitate-out potential fugitive airborne dust and to keep exposed soil surfaces moist during excavation and loading;
- BMP No. 3 - Direct load soil from below the synthetic layers of the MMC into lined, roll-off containers with sealable covers stationed as close to the excavation zone as practicable;
- BMP No. 4 - Cover excavation surfaces with geotextile as soon as practicable during the excavation sequence to reduce the area of exposed soil that could be a source of windblown dust. Other soil sealing materials such as polyethylene plastic sheeting and foam spray will be applied to excavation slopes. The bottom of the excavation zone will be further sealed by installing a clean, aggregate layer, thereby allowing workers to perform work in a clean zone; and
- BMP No. 5 - Cover the clean soil stockpile with polyethylene plastic sheeting, secured by sand bags, to reduce the potential for these areas to be a source of windblown dust.

Additional corrective actions to control a dust release from a work zone will include establishing a wind curtain by attaching fabric to a temporary fence upwind of the work zone, and by increasing the aerosolized water misting downwind of the work zone.

4.0 RESPONSE ACTIONS AND NOTIFICATIONS

Response actions and notifications pertain to the project-specific Total PM action level exceedances that could occur at the fixed, perimeter air monitoring and/or mobile Work Zone and clean soil stockpile area monitoring locations. The air monitoring data collected from the off-site monitoring stations will be used for comparison to air monitoring data collected from the on-site monitoring stations, and may be used to refine the Total PM action level and CrVI Background Threshold Value (BTV) during the construction intrusive activities period, subject to approval by EPA and MDE. Real-time Total PM data and the STEL alarms will be continuously monitored via telemetry from the fixed, perimeter and off-site stations (STEL alarms will not be set for the off-site locations) during intrusive construction workdays.

In addition, since the DustTrak monitors only read particulates up to 15 microns in size, the field technician and/or field manager are responsible for a minimum of three (3) visual inspections per day of the work zones for large particulate releases during pile driving or large scale MMC removal during moment slab construction. These inspections will be documented daily in the field logbooks and will coincide with the construction activities most likely to produce large particulate releases. If such a release is observed, it should be documented photographically, if possible, and work will be stopped temporarily in order to apply aerosolized water misting to control the release. If this corrective action is taken, a Visual Particulate Release Event Log will be completed (the event logs are found Appendix A, B and C).

4.1 SCENARIO NO. 1 – ACTION LEVEL EXCEEDANCE AT WORK ZONE MONITOR LOCATION(S)

Scenario No. 1 addresses the situation when the STEL alarm is triggered by a mobile monitor station downwind of the work zone, indicated by a discrete 15-minute PM average exceeding the BTV action level.

4.1.1 Response Action for Scenario No. 1

The step by step response for Scenario No. 1 is as follows:

- Step No. 1 – Best efforts will be made to conduct Step 1 within approximately ten (10) minutes of alarm notification to the Field Manager and Field Technician. Inspect the immediate Work Zone area where the DustTrak monitor(s) sounded the alarm to assess

whether there is an identifiable source of dust or activity related to construction intrusive work that may be triggering the alarm by answering the following questions:

1. Is visible dust releasing from the specific work zone intrusive activity?

2. Is the construction equipment (e.g., pile drivers) releasing visible smoke within range of the monitor(s)?

3. Are there other nearby visible sources of particulate release, e.g., the cover soil stockpile, idling vehicles, etc.?

    a. If the work zone appears to be or is suspected to be the dust source, corrective action will be taken immediately to eliminate, control or manage that cause to reduce the potential for its recurrence. Additional corrective actions to control a dust release from a work zone will include establishing a wind curtain by attaching fabric to a temporary fence upwind of the work zone, and by increasing the aerosolized water misting downwind of the work zone. The alarming DustTrak monitor will then be observed for another 15-minute average to document that the instrument is no longer indicating a BTV action level exceedance. Under this scenario, no further action is required after a 15 minute Total PM average that does not exceed the BTV action level. An event log will be prepared.

    b. If an alternate nearby dust source is suspected based on the answers to the questions above, that source should be temporarily eliminated (e.g., stop pile driving, turn off idling vehicle, etc.), and the 15-minute averages continued until the STEL alarm ceases. Under this scenario, no further action is required after a 15-minute Total PM average that does not exceed the BTV action level. An event log will be prepared.

- Step No. 2 – If Step 1 does not resolve the DustTrak alarm, inspect the DustTrak Work Zone instrument that sounded the alarm for possibility that the DustTrak may be malfunctioning.

    a. If the DustTrak instrument that sounded appears to be malfunctioning as evidenced by alerts sent by telemetry when negative readings are recorded or loss of power occurs, after checking the other Work Zone mobile station instrument operation and concentration readings, run the

Zero Cal and Flow Cal verifications and re-start the previously alarming DustTrak; and

b. Observe another 15-minute average to document that the instrument is no longer malfunctioning. Under this scenario, no further action is required after approximately 30 minutes from the initial alarm. An event log will be prepared.

- Step No. 3 - If Step 2 does not resolve the monitor alarm, the Field Manager, in consultation with the ERM Project Manager**,** MDE inspector or on-site EPA representative, or alternate Agency contacts, will check the Total PM readings of all on-site and off-site monitors for consistency of reported Total PM concentrations:

    a. Check the Total PM level(s) at each downwind Work Zone monitor(s) and the fixed, perimeter DustTrak stations, to assess the possibility that the source of the Total PM concentrations that triggered the alarm are caused by or being contributed to by upwind, off-site conditions unrelated to construction. If the downwind Work Zone monitor(s) Total PM readings and fixed, perimeter monitor Total PM readings upwind and downwind are similar, then all Work Zone and fixed, perimeter stations will be observed for another 15-minute average to document that there is no action level exceedance or that upwind and downwind conditions are similar. The off-site Total PM results will also be continuously compared to the on-site Total PM results in relation to wind direction, to strengthen the upwind/downwind comparisons. Under this scenario, no further action is required after a 15 minute Total PM average that does not exceed the BTV action level. An event log will be prepared.

- Step No. 4 - If after having followed Steps No. 1 through 3, the Total PM concentration is not improving and remains at or above the alarm level:

    a. The Field Manager, in consultation with the ERM Project Manager, MDE inspector or on-site EPA representative, or alternate Agency contacts, will **STOP** all potential dust generating work activities (which may include activities outside of the Work Zone) that may be potentially contributing Total PM concentrations above the action level;

b. The Field Manager, in consultation with the ERM Project Manager, MDE inspector or on-site EPA representative, or alternate Agency contacts, will visually observe the efficacy of the SOP BMPs and the additional corrective measures implemented;

c. The Field Manager, in consultation with the ERM Project Manager, MDE inspector or on-site EPA representative, or alternate Agency contacts, will establish a CrVI sampler at the Work Zone mobile location with the highest Total PM level that exceeds the action level. Collect a CrVI sample for 24 hours and submit the sample for the three (3) business day turnaround analysis by the laboratory. Also initiate CrVI sampling at the fixed, perimeter stations, if not already in progress. Sampling and analyses will be in accordance with the QAPP;

d. Resume construction activities once the downwind Work Zone mobile DustTrak monitors indicate that Total PM concentrations are below the action level for 30 continuous minutes and there are no exceedances of the action level at any of the perimeter air monitoring locations;

e. Document the additional corrective actions taken in the Work Zone STEL Alarm Event Log;

f. Record the CrVI sample analytical results from the mobile Work Zone and fixed, perimeter monitoring locations in the project's daily files.

4.1.2 Notifications Under Scenario No. 1

The Work Zone STEL Alarm Event Log will be completed by the Field Manager. If the work zone STEL event is resolved at Step 3, the EPA and MDE Project Coordinators (or Alternates if the Coordinators are unavailable) will be contacted on the event day and the STEL Alarm Event Log will be transmitted to the EPA and MDE Project Coordinators on the event day. If the work zone STEL event is resolved at Step 4 (Stop Work), the EPA and MDE Project Coordinators (or Alternates if the Coordinators are unavailable) will be contacted immediately.

As part of Step 4, a Stop Work event log will be prepared and the Field Manager, in consultation with the ERM Project Manager, MDE inspector or on-site EPA representative, or alternate Agency contacts, will notify the primary points of contact provided in Table 1 immediately following the

issuance of the Stop Work order. It is expected that the Field Manager, in consultation with the ERM Project Manager, MDE inspector or on-site EPA representative, or alternate Agency contacts, will work together with AHCC's Sr. Project Manager to resolve the on-site conditions. The Field Manager, in consultation with the ERM Project Manager, MDE inspector or on-site EPA representative, or alternate Agency contacts, will also assess and document the potential for upwind and/or off-site, dust source contribution based on the off-site monitoring station Total PM readings.

4.2 SCENARIO NO. 2 – ACTION LEVEL EXCEEDANCE AT ON-SITE PERIMETER MONITOR LOCATION

Scenario No. 2 addresses the situation when the STEL alarm is triggered at a fixed perimeter monitor station, indicated by a discrete 15-minute PM average exceeding the NAAQS action level**.** The steps below address conditions during the intrusive construction work day. If an alarm condition occurs during non-working hours when the construction site is inactive for the day or weekend, the alarm condition will be addressed following the steps below prior to commencing work the next work day.

4.2.1 Response Action for Scenario No. 2

The step by step response for Scenario No. 2 is as follows:

- Step No. 1 - The Work Zone construction activities will be temporarily shut down. The Field Manager, in consultation with the ERM Project Manager, MDE inspector or on-site EPA representative, or alternate Agency contacts, and the construction contractor's Sr. Project Manager will work together to ensure that the SOP BMP measures are in place. The Field Manager, in consultation with the ERM Project Manager, MDE inspector or on-site EPA representative, or alternate Agency contacts, will observe all perimeter monitor and off-site monitor readings for Total PM concentrations for 30 continuous minutes (two, 15-minute averages);

- Step No. 2 - Inspect the fixed, perimeter monitor that sounded the alarm for the possibility that the DustTrak monitor may be malfunctioning, as evidenced by alerts sent by telemetry when negative readings are recorded or loss of power occurs.

    a. If the DustTrak instrument that sounded appears to be malfunctioning, after checking the other fixed, perimeter station(s) instrument operation and concentration readings

for consistency of reported Total PM concentrations, run the Zero Cal and Flow Cal verifications and re-start the previously alarming DustTrak; and

b. Observe another 15- minute PM average to document that the instrument is no longer malfunctioning. Under this scenario, no further action is required after 45 minutes (three, 15 minute averages) from the initial alarm and work interruption. Resume construction activities and prepare an event log.

- Step No. 3 - If after following Steps No. 1 and 2, the Total PM concentration is not improving and remains at or above the alarm level:

  a. The Field Manager, in consultation with the ERM Project Manager, MDE inspector or on-site EPA representative, or alternate Agency contacts, will maintain the **STOP** work action involving all potential dust generating work activities (which may include activities outside of the Work Zone) that may be potentially contributing Total PM concentrations above the action level; and

  b. The Field Manager, in consultation with the ERM Project Manager, MDE inspector or on-site EPA representative, or alternate Agency contacts, will compare all perimeter monitor results with the off-site monitor results; and

  c. The Field Manager, in consultation with the ERM Project Manager, MDE inspector or on-site EPA representative, or alternate Agency contacts, will initiate CrVI sampling at the fixed, perimeter stations, if not already in progress, and establish CrVI samplers at the Work Zone mobile locations; collect CrVI samples for 24 hours, and submit the samples for the three (3) business day turnaround analysis by the laboratory. Sampling and analyses will be in accordance with the QAPP;

  d. After the fixed, perimeter station DustTrak monitors indicate that the 15-minute PM averages are below the action level for 30 continuous minutes and there are no 15-minute exceedances of the action level at any of the perimeter air monitoring locations, resume construction activities;

e. Document SOP BMPs and additional corrective measures taken in an event log;

g. Record the CrVI sample analytical results from the mobile Work Zone and fixed, perimeter monitoring locations in the project's daily files.

4.2.2 Notifications Under Scenario No. 2

Under Scenario No. 2, the Field Manager, or designee, in consultation with the ERM Project Manager, MDE inspector or on-site EPA representative, or alternate Agency contacts, will notify the primary points of contact provided in Table 1 immediately following the initial alarm and work stoppage. Following resolution of the DustTrak alarm, the Field Manager, or designee, in consultation with the ERM Project Manager, MDE inspector or on-site EPA representative, or alternate Agency contacts, will notify the primary points of contact provided in Table 1 immediately of the resumption of work activities. The Perimeter STEL Alarm Event Log will be completed by the Field Manager and immediately transmitted to the EPA and MDE Project Coordinators.

4.3 ACTION LEVEL EXCEEDANCE AT COVER SOIL STOCKPILE MONITOR LOCATION

In order to reduce the likelihood of dust release from the clean cover soil stockpile, SOP BMPs will include:

a) The stockpile will be completely covered with plastic sheeting secured by sand bags at all times, except for when it is being loaded or unloaded;

b) During the loading/unloading operation, aerosolized water mist will be continuously applied at the downwind face.

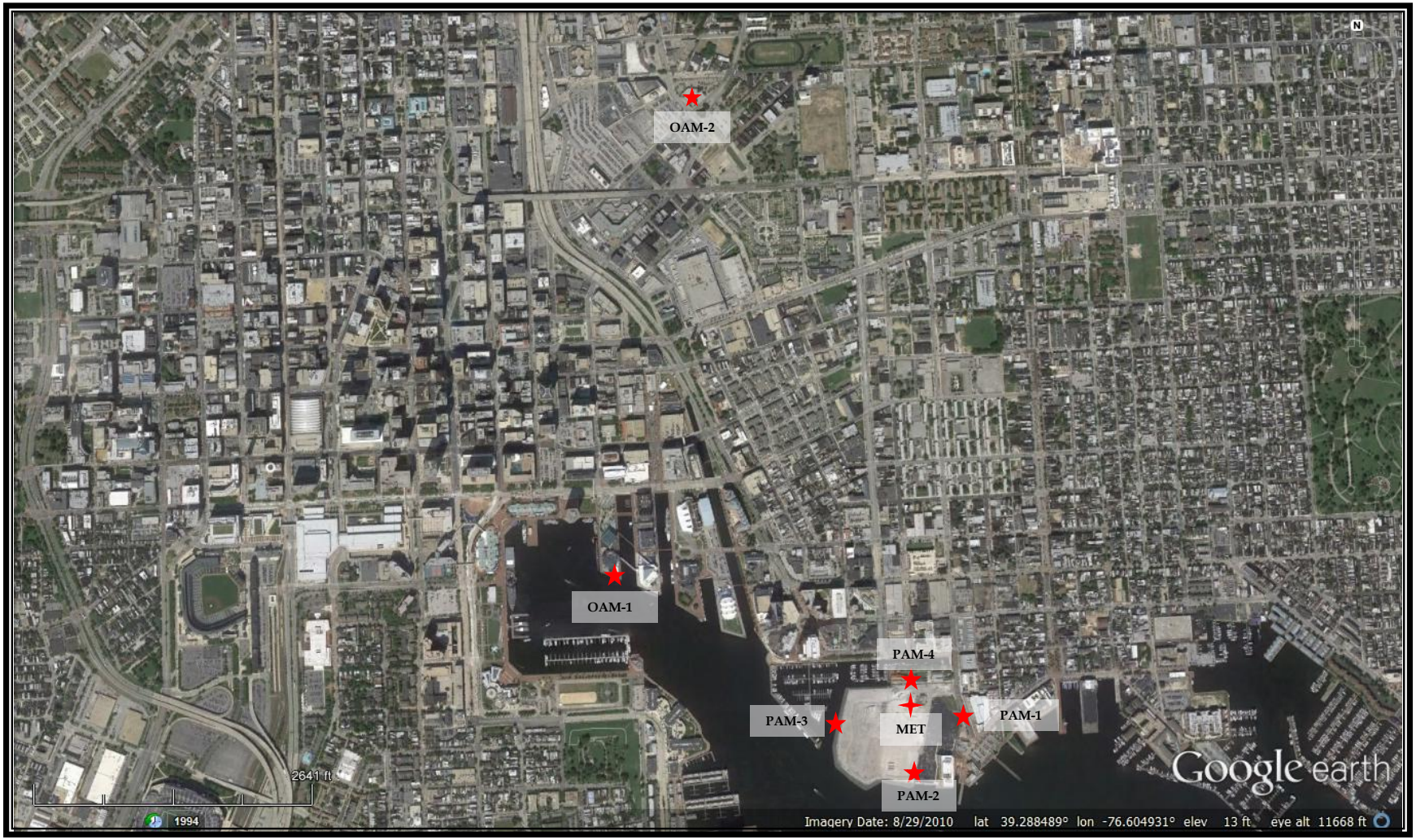
If the stockpile monitor STEL event is triggered by a discrete 15-minute PM average exceeding the BTV action level, then loading/unloading operations will stop and aerosolized water misting will continue until the STEL alarm ceases. This will be documented in the field log book.

The spatial dimensions and location of stockpile and the locations of each DustTrak monitor in relation to the dimensions of stockpile are provided in Figure 5 (example used to site the locations; wind from west). The monitor locations will be spaced approximately 50 feet downwind of the Work Zone and intrusive construction activities. The daily procedure for

establishing the downwind position of the monitors will require that the prevailing wind direction be determined from the on-site meteorological data, prior to intrusive work activities each morning. The on-site meteorological station wind direction will be observed by the Field Manager, approximately every two (2) hours. Should the wind direction shift and become consistent from another direction for two (2) hours, the locations of the monitors will be adjusted accordingly to the new downwind locations.

Figure 1
Site Location Map

Figure 2
Construction Air Monitoring Locations
Harbor Point
Baltimore, Maryland



MET – Meteorological Station
PAM – Perimeter Air Monitor
OAM – Off-site Air Monitor
1 – Baltimore National Aquarium
2 – MDE's Old Town Station

Figure 3

Response Actions and Notifications to Action Level Exceedances

SCENARIO 1

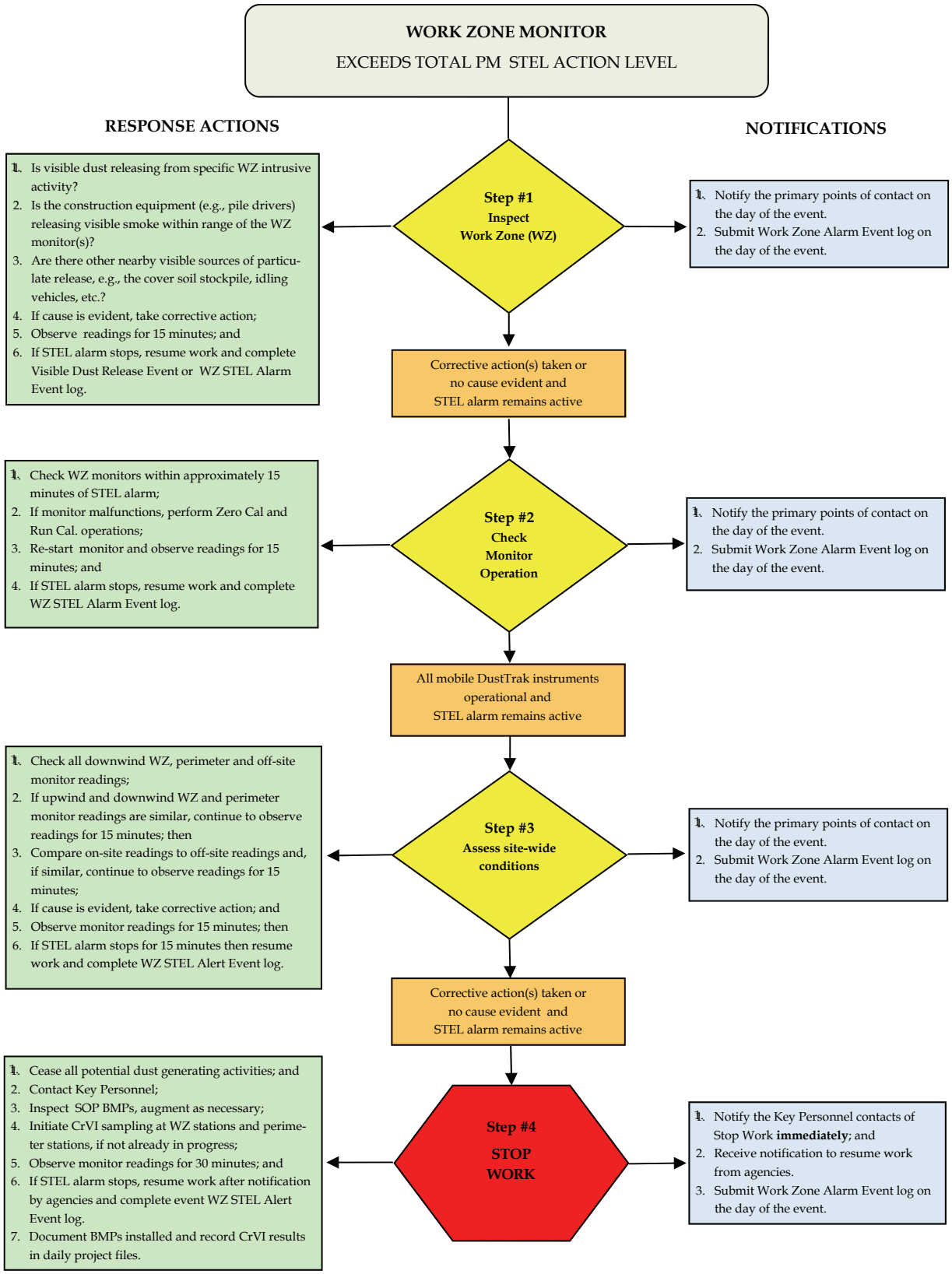


Figure 4

Response Actions and Notifications to Action Level Exceedances

SCENARIO 2

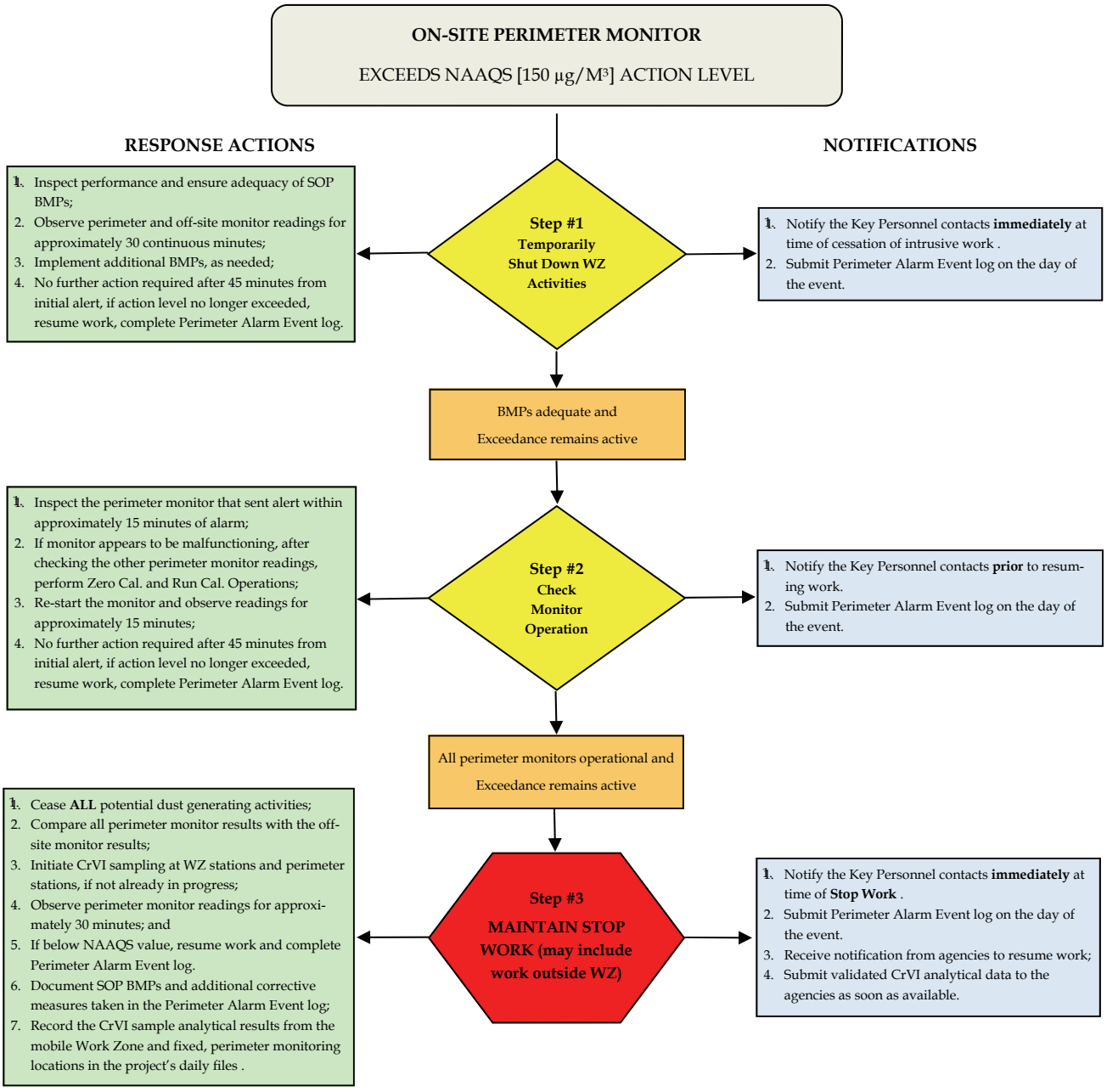


Figure 5
Response Actions and Notifications to Action Level Exceedances
MOBILE STATIONS (✸)
(Westerly Wind Direction Example)

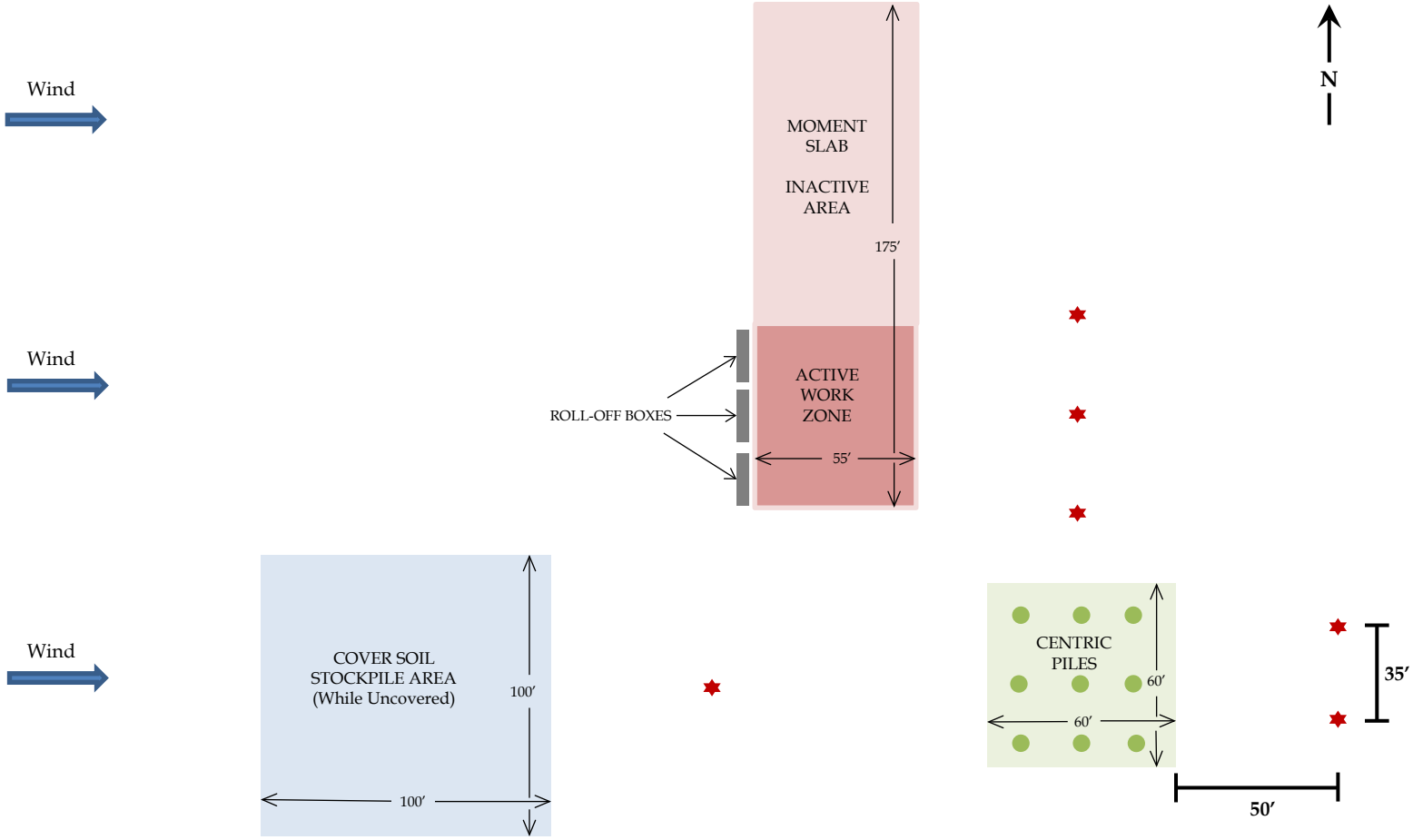
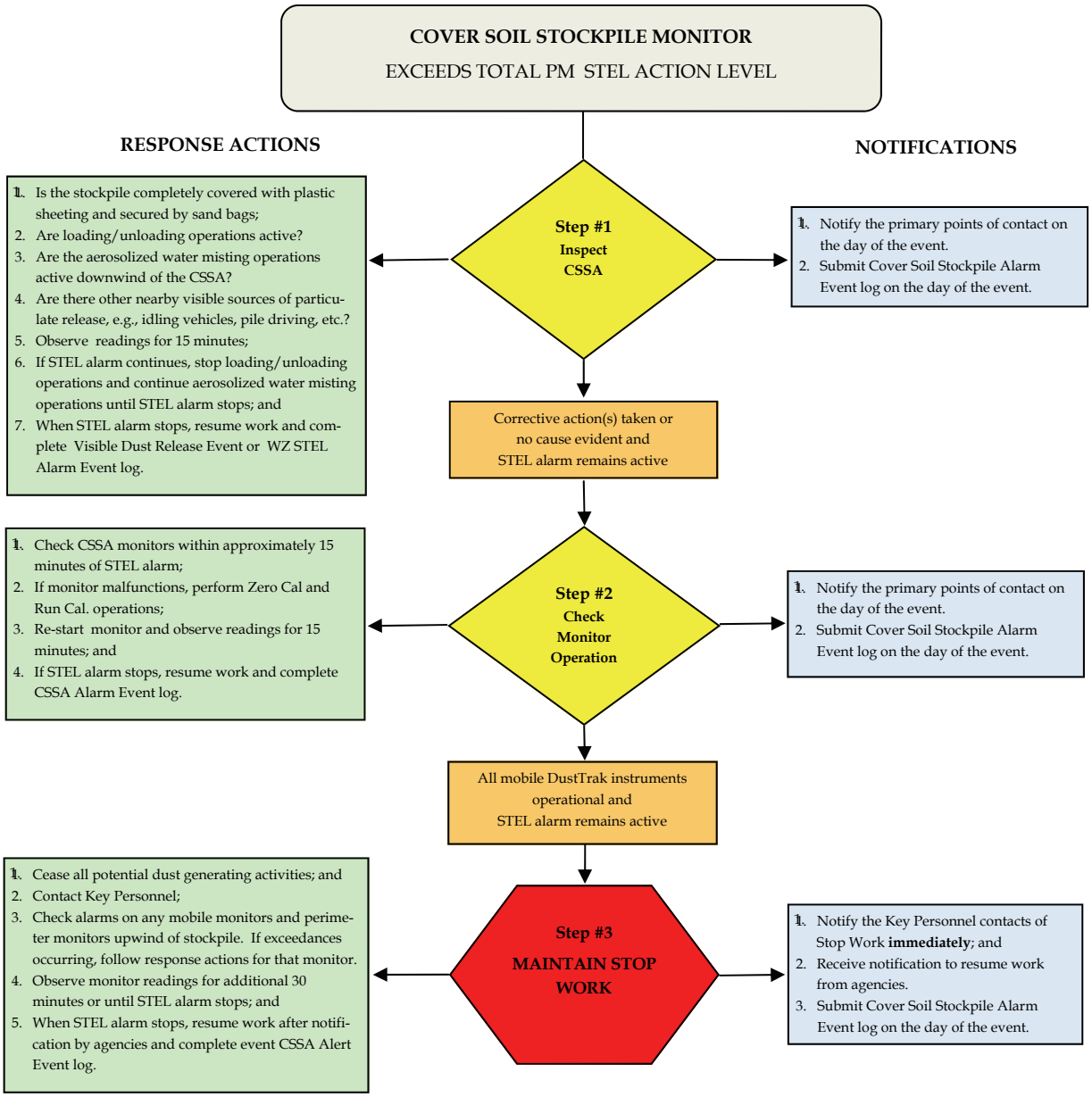


Figure 6

Response Actions and Notifications to Action Level Exceedance at Cover Soil Stockpile Area (CSSA)



ERM WO 199768

CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
WORK ZONE STEL ALARM EVENT LOG

Date:

Field Technician (Print and Sign Name)

Others Present During STEL Event? Provide Name(s)

Weather Observations (rain, dry, windy, etc.)

EVENT TIME LOG

Station ID							
First Alarm							
Initiation of alarm monitoring period and duration							
First Response Action							
Additional Response Actions							
Stop Work							
Event Resolution							
Notifications to Key Personnel							
Duration of Event							

1. Is visible dust releasing from specific WZ intrusive activity?

2. Is the construction equipment (e.g., pile drivers) releasing visible smoke within range of the WZ monitor(s)?

3. Are there other nearby visible sources of particulate release, e.g., the cover soil stockpile, idling vehicles, etc.?

4. Has Work Zone monitor that sounded the alert been inspected?

5. Does the Work Zone monitor that sounded the alert appear to be malfunctioning?

6. Are the readings for the other Work Zone monitors reporting consistent readings?

Observations and photographs of any observed conditions that may have potential to affect STEL:

Comments regarding established BMPs:

Recommendations for and Implemented Corrective Actions:

Were intrusive activities stopped? When? Duration (stop and start time)?

Were Key Personnel contacted? Who? When?

Key Personnel

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Email: charles.mcclellan@erm.com

Indicate if DustTrak Maintenance Performed to Confirm Operation	Yes	No
Perform Zero Check before each use		
Perfom Flow Verification before each use		
Clean inlet after two weeks continuous monitoring		
Replace internal filters after two weeks continuous monitoring		

Flow Verication Using BIOS Defender 510-H Performed to Confirm Operation						
Location ID	**Serial ID**	**Start Time (24 hour clock)**	**Start Flow (Lpm)**	**End Time (24 hour clock)**	**End Flow (Lpm)**	**CrVI Samples Collected and Other Comments/Photos**
PAM-1						
PAM-1 Duplicate						
PAM-2						
PAM-3						
PAM-4						
MOBILE						
MOBILE						
MOBILE						
MOBILE						
MOBILE						

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CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
PERIMETER NAAQS ALARM EVENT LOG

Date:

Field Technician (Print and Sign Name)

Were intrusive Work Zone activities temporarily ceased? When?
Duration (stop and start time)

Were Key Personnel contacted? Who? When?

Others Present During Perimeter Event? Provide Name(s)

Weather Observations (rain, dry, windy, etc.)

1. Has perimeter monitor that sounded the alert been inspected?

2. Is the perimeter monitor that sounded the alert appear to be malfunctioning?

3. Are the readings for the other perimeter monitors reporting consistent readings?

4. Are there other nearby visible sources of particulate release, e.g., the cover soil stockpile, idling vehicles, etc.?

Observations and photographs of any observed conditions that may have potential to affect STEL:

Comments regarding established BMPs:

Recommendations for and Implemented Corrective Actions:

EVENT TIME LOG

Station ID							
First Alarm							
Initiation of alarm monitoring period and duration							
First Response Action							
Additional Response Actions							
Stop Work							
Event Resolution							
Notifications to Key Personnel							
Duration of Event							

Indicate if DustTrak Maintenance Performed to Confirm Operation	Yes	No
Perform Zero Check before each use		
Perfom Flow Verification before each use		
Clean inlet after two weeks continuous monitoring		
Replace internal filters after two weeks continuous monitoring		

Key Personnel

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Flow Verication Using BIOS Defender 510-H Performed to Confirm Operation						
Location ID	**Serial ID**	**Start Time (24 hour clock)**	**Start Flow (Lpm)**	**End Time (24 hour clock)**	**End Flow (Lpm)**	**CrVI Samples Collected and Other Comments/Photos**
PAM-1						
PAM-1 Duplicate						
PAM-2						
PAM-3						
PAM-4						
MOBILE						
MOBILE						
MOBILE						
MOBILE						
MOBILE						

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CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
VISUAL PARTICULATE RELEASE EVENT LOG

Date:

Field Technician (Print and Sign Name)

Others Present During Event? Provide Name(s)

EVENT TIME LOG

Nearest Station ID							
First Visible Dust Observation							
Initiation of Stop Work							
Conclusion of Stop Work							
Additional Response Actions							
Event Resolution							
Notifications to Key Personnel							
Duration of Event							

Weather Observations (rain, dry, windy, etc.)

1. Is visible dust releasing from specific WZ intrusive activity? If YES, stop work temporarily, continue aerosolized misting operations until visible dust release terminates.

Were intrusive activities stopped? When? Duration (stop and start time)?

Were Key Personnel contacted? Who? When?

2. Is the construction equipment (e.g., pile drivers) releasing visible smoke within range of the WZ monitor(s)?

3. Are there other nearby visible sources of particulate release, e.g., the cover soil stockpile, idling vehicles, etc.?

Observations and photographs of observed conditions that may have potential to affect visible dust:

Recommendations for and Implemented Corrective Actions:

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CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
CSSA STEL ALARM EVENT LOG

Date:

Field Technician (Print and Sign Name)

Others Present During STEL Event? Provide Name(s)

Weather Observations (rain, dry, windy, etc.)

EVENT TIME LOG

Station ID							
First Alarm							
Initiation of alarm monitoring period and duration							
First Response Action							
Additional Response Actions							
Stop Work							
Event Resolution							
Notifications to Key Personnel							
Duration of Event							

1. Is the stockpile completely covered with plastic sheeting and secured by sand bags?

2. Are loading/unloading operations active?

3. Are the aerosolized water misting operations active downwind of the CSSA?

4. Are there other nearby visible sources of particulate release, e.g., idling vehicles, pile driving, etc.

5. Has CSSA monitor that sounded the alert been inspected?

6. Does the CSSA monitor that sounded the alert appear to be malfunctioning?

7. What is status of any mobile or perimeter monitors upwind of stockpile?

Observations and photographs of any observed conditions that may have potential to affect STEL:

Comments regarding established BMPs:

Recommendations for and Implemented Corrective Actions:

Were loading/unloading activities stopped? When? Duration (stop and start time)?

Were Key Personnel contacted? Who? When?

Key Personnel

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Indicate if DustTrak Maintenance Performed to Confirm Operation	Yes	No
Perform Zero Check before each use		
Perfom Flow Verification before each use		
Clean inlet after two weeks continuous monitoring		
Replace internal filters after two weeks continuous monitoring		

Flow Verication Using BIOS Defender 510-H Performed to Confirm Operation						
Location ID	**Serial ID**	**Start Time (24 hour clock)**	**Start Flow (Lpm)**	**End Time (24 hour clock)**	**End Flow (Lpm)**	**CrVI Samples Collected and Other Comments/Photos**
PAM-1						
PAM-1 Duplicate						
PAM-2						
PAM-3						
PAM-4						
MOBILE						
MOBILE						
MOBILE						
MOBILE						
MOBILE						

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CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
WORK ZONE STEL ALARM EVENT LOG

Date:

Field Technician (Print and Sign Name)

Others Present During STEL Event? Provide Name(s)

EVENT TIME LOG

Station ID							
First Alarm							
Initiation of alarm monitoring period and duration							
First Response Action							
Additional Response Actions							
Stop Work							
Event Resolution							
Notifications to Key Personnel							
Duration of Event							

Weather Observations (rain, dry, windy, etc.)

1. Is visible dust releasing from specific WZ intrusive activity?

3. Are there other nearby visible sources of particulate release, e.g., the cover soil stockpile, idling vehicles, etc.?

4. Has Work Zone monitor that sounded the alert been inspected?

5. Does the Work Zone monitor that sounded the alert appear to be malfunctioning?

6. Are the readings for the other Work Zone monitors reporting consistent readings?

Observations and photographs of any observed conditions that may have potential to affect STEL:

Comments regarding established BMPs:

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CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
WORK ZONE STEL ALARM EVENT LOG

Recommendations for and Implemented Corrective Actions:

Were intrusive activities stopped? When? Duration (stop and start time)?

Were Key Personnel contacted? Who? When?

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CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
WORK ZONE STEL ALARM EVENT LOG

Indicate if DustTrak Maintenance Performed to Confirm Operation	Yes	No
Perform Zero Check before each use		
Perfom Flow Verification before each use		
Clean inlet after two weeks continuous monitoring		
Replace internal filters after two weeks continuous monitoring		

Flow Verication Using BIOS Defender 510-H Performed to Confirm Operation						
Location ID	**Serial ID**	**Start Time (24 hour clock)**	**Start Flow (Lpm)**	**End Time (24 hour clock)**	**End Flow (Lpm)**	**CrVI Samples Collected and Other Comments/Photos**
PAM-1						
PAM-1 Duplicate						
PAM-2						
PAM-3						
PAM-4						
MOBILE						
MOBILE						
MOBILE						
MOBILE						
MOBILE						

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CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
PERIMETER NAAQS ALARM EVENT LOG

Date:

Field Technician (Print and Sign Name)

Were intrusive Work Zone activities temporarily ceased? When?
Duration (stop and start time)

Were Key Personnel contacted? Who? When?

Others Present During Perimeter Event? Provide Name(s)

Weather Observations (rain, dry, windy, etc.)

1. Has perimeter monitor that sounded the alert been inspected?

2. Is the perimeter monitor that sounded the alert appear to be malfunctioning?

3. Are the readings for the other perimeter monitors reporting consistent readings?

EVENT TIME LOG

Station ID							
First Alarm							
Initiation of alarm monitoring period and duration							
First Response Action							
Additional Response Actions							
Stop Work							
Event Resolution							
Notifications to Key Personnel							
Duration of Event							

Key Personnel

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CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
PERIMETER NAAQS ALARM EVENT LOG

Observations and photographs of any observed conditions that may have potential to affect STEL:

Comments regarding established BMPs:

Recommendations for and Implemented Corrective Actions:

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CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
PERIMETER NAAQS ALARM EVENT LOG

Indicate if DustTrak Maintenance Performed to Confirm Operation	Yes	No
Perform Zero Check before each use		
Perfom Flow Verification before each use		
Clean inlet after two weeks continuous monitoring		
Replace internal filters after two weeks continuous monitoring		

Flow Verication Using BIOS Defender 510-H Performed to Confirm Operation						
Location ID	**Serial ID**	**Start Time (24 hour clock)**	**Start Flow (Lpm)**	**End Time (24 hour clock)**	**End Flow (Lpm)**	**CrVI Samples Collected and Other Comments/Photos**
PAM-1						
PAM-1 Duplicate						
PAM-2						
PAM-3						
PAM-4						
MOBILE						
MOBILE						
MOBILE						
MOBILE						
MOBILE						

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CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
CSSA STEL ALARM EVENT LOG

Date:

Field Technician (Print and Sign Name)

Others Present During STEL Event? Provide Name(s)

Weather Observations (rain, dry, windy, etc.)

EVENT TIME LOG

Station ID							
First Alarm							
Initiation of alarm monitoring period and duration							
First Response Action							
Additional Response Actions							
Stop Work							
Event Resolution							
Notifications to Key Personnel							
Duration of Event							

1. Is the stockpile completely covered with plastic sheeting and secured by sand bags?

2. Are loading/unloading operations active?

3. Are the aerosolized water misting operations active downwind of the CSSA?

4. Are there other nearby visible sources of particulate release, e.g., idling vehicles, pile driving, etc.

5. Has CSSA monitor that sounded the alert been inspected?

6. Does the CSSA monitor that sounded the alert appear to be malfunctioning?

Key Personnel

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CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
CSSA STEL ALARM EVENT LOG

Observations and photographs of any observed conditions that may have potential to affect STEL:

Comments regarding established BMPs:

Recommendations for and Implemented Corrective Actions:

Were loading/unloading activities stopped? When? Duration (stop and start time)?

Were Key Personnel contacted? Who? When?

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CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
CSSA STEL ALARM EVENT LOG

Indicate if DustTrak Maintenance Performed to Confirm Operation	Yes	No
Perform Zero Check before each use		
Perfom Flow Verification before each use		
Clean inlet after two weeks continuous monitoring		
Replace internal filters after two weeks continuous monitoring		

Flow Verication Using BIOS Defender 510-H Performed to Confirm Operation						
Location ID	**Serial ID**	**Start Time (24 hour clock)**	**Start Flow (Lpm)**	**End Time (24 hour clock)**	**End Flow (Lpm)**	**CrVI Samples Collected and Other Comments/Photos**
PAM-1						
PAM-1 Duplicate						
PAM-2						
PAM-3						
PAM-4						
MOBILE						
MOBILE						
MOBILE						
MOBILE						
MOBILE						

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CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
VISUAL PARTICULATE RELEASE EVENT LOG

Date:

Field Technician (Print and Sign Name)

Others Present During Event? Provide Name(s)

EVENT TIME LOG

Nearest Station ID							
First Visible Dust Observation							
Initiation of Stop Work							
Conclusion of Stop Work							
Additional Response Actions							
Event Resolution							
Notifications to Key Personnel							
Duration of Event							

Weather Observations (rain, dry, windy, etc.)

1. Is visible dust releasing from specific WZ intrusive activity? If YES, stop work temporarily, continue aerosolized misting operations until visible dust release terminates.

Were intrusive activities stopped? When? Duration (stop and start time)?

Were Key Personnel contacted? Who? When?

2. Is the construction equipment (e.g., pile drivers) releasing visible smoke within range of the WZ monitor(s)?

3. Are there other nearby visible sources of particulate release, e.g., the cover soil stockpile, idling vehicles, etc.?

Key Personnel

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CONSTRUCTION AIR MONITORING
HARBOR POINT - AREA 1
VISUAL PARTICULATE RELEASE EVENT LOG

Observations and photographs of observed conditions that may have potential to affect visible dust:

Recommendations for and Implemented Corrective Actions: