Sub-Slab Depressurization System Work Plan
Former Davis-Howland Oil Corporation Site
NYSDEC Site No. 828088

Location:

190, 192-200 & 220 Anderson Avenue
Rochester, New York 14607

Prepared for:

Anderson Acquisitions, LLC
501 S Clinton Avenue
Rochester, New York 14620

LaBella Project No. 2171609
April 2018

300 State Street, Suite 201 | Rochester, NY 14614 | p 585-454-6110 | f 585-454-3066
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CERTIFICATION

I Daniel P. Noll certify that I am currently a NYS registered professional engineer and that this Sub-Slab Depressurization System Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

081996	4/13/18	
NYS Professional Engineer #	Date	Signature

1.0 Introduction

LaBella Associates, D.P.C. (LaBella) is pleased to submit this Sub-Slab Depressurization System (SSDS) Work Plan to install a vapor mitigation system at 190, 192-200 and 220 Anderson Avenue, City of Rochester, Monroe County, New York, herein after referred to as the "Site". The Site is part of the Former Davis-Howland Oil Corporation Site which is a New York State Department of Environmental Conservation (NYSDEC) Superfund Site. The Site was listed on the New York State Registry of Inactive Hazardous Waste Disposal Sites (IHWDS) (#828088) in 1995. A Site Location Map is included as Figure 1. LaBella is submitting this SSDS Work Plan on behalf of the current owner, Anderson Acquisitions, LLC.

An air sparge (AS) soil vapor extraction (SVE) system has been in operation at the Site since 2001 to remediate volatile organic compounds (VOCs) in soil and groundwater at the Site associated with former Site operations. The NYSDEC is preparing to discontinue and decommission the system at which time a SSDS is required to be installed and operating within the Site Buildings to mitigate potential sub-slab soil vapors that may enter the building via soil vapor intrusion (SVI). This Work Plan includes installation, startup and post-startup testing of a SSDS for the buildings at 190, 192-200 and 220 Anderson Avenue.

1.1 Site Description and Background

The Site is comprised of three (3) contiguous tax parcels (190, 192-200 and 220 Anderson Avenue) totaling approximately 0.43-acres of land in the City of Rochester (refer to Figure 2) and is a part of a larger 1-acre Superfund Site comprising 190-220 Anderson Avenue and a portion of 176 Anderson Avenue. The Site was used from 1942 to 1972 to produce industrial chemicals, oils, greases, and other lubricants and from 1972 to 1994 the Site was used by Davis Howland Oil Company. All manufacturing and processing operations were ceased in 1994.

Subsurface material at the Site reportedly generally consists of a layer of fill material to depths up to 5-feet (ft) below ground surface (bgs) overlaying sand and gravel and glacial till. Bedrock consists of Penfield Dolostone and was encountered at depths ranging from approximately 17-27-ft bgs.

1.2 Previous Investigations

The following environmental investigations took place at the Site:

- **Soil Investigation, NYSDEC, 1991**- This investigation was a result of a NYSDEC inspection which identified drums of oils and solvents, some of which were leaking. This investigation consisted of soil sampling and containerizing leaking drums. Results identified soil contaminated with petroleum and solvents.
- **Remedial Soil Investigation, Dunn Geosciences Corporation (DGC), 1991**- This investigation consisted of test pits and soil gas sampling north of the Site Buildings. This investigation recommended removal of the uppermost 1-2-feet of visually contaminated soils before any remediation of deeper soils.
- **Interim Remedial Measure, Clean Harbors, 1992-** Interim Remedial Measures (IRMs) including removal of drummed waste and shallow soils was conducted. Soil and groundwater sampling was also completed and identified groundwater was contaminated with chlorinated and non-chlorinated solvents and metals.

- **Groundwater Sampling, NYSDEC, 1994-** The NYSDEC sampled groundwater monitoring wells installed during the previous investigation by Clean Harbors to assist in development of a Remedial Investigation and Feasibility Study.
- **Two-Phase Remedial Investigation, Lawler, Matusky, Skelly Engineers, LLP, and Galson/ Lozier Engineers, 1995-1997-** The first phase of this investigation included well inventory and literature search, soil gas survey, groundwater sampling and groundwater flow direction mapping, soil boring advancement, sewer inspection, exposure pathway and habitat based assessment. The second phase of this investigation included installation of bedrock monitoring wells and additional overburden wells, groundwater sampling from newly installed and previously installed wells, groundwater elevation contouring, surface soil sampling and an air sparging (AS) and soil vapor extraction (SVE) pilot study to assess the effectiveness of these technologies for addressing groundwater contamination.
- **Pre-Remedial Design Phase Investigation, 1998-** This investigation consisted of confirmation of metals contaminated soil volume to be excavated, installation of additional bedrock monitoring wells, a pumping test, and evaluation of pilot tests for AS and SVE.
- **Phase II Environmental Site Investigation, Leader Professional Services, Inc. 2017-** A sub-slab soil vapor and indoor air sample were collected which identified chlorinated solvents trichloroethene (TCE) and tetrachloroethene (PCE) in sub-slab soil vapor at elevated concentrations.

Contaminants of concern identified at the Site included volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals (cadmium, chromium and lead) in soil and groundwater.

1.3 Summary of Remedial Actions

Operable Unit 1 (OU-1) consists of shallow groundwater, surface soil, and subsurface soil. OU-2 consists of bedrock groundwater. The NYSDEC provided Records of Decision (RODs) for the two (2) OUs dated March 1997 (OU-1) and March 1998 (OU-2).

OU-1: Shallow Groundwater, Surface Soil and Subsurface Soil
The selected remedy for OU-1 included AS/SVE and soil excavation. The remedial system was constructed beginning in June 2001 and consisted of the following:

- 47 AS points
- 8 SVE points
- 3 groundwater extraction wells
- 2 blasted bedrock trench recovery wells

A trailer-mounted treatment system consisting of an air stripper and an AS/SVE system with a catalytic oxidation unit for soil vapor was installed north of the Site buildings. Based on air quality data, the catalytic oxidation unit was removed in 2003. In addition as part of the OU-1 remedy, an underground storage tank (UST) was removed and excavation of contaminated soils was conducted, and asphalt pavement was installed over portions of the Site.

OU-2: Bedrock Groundwater
The selected remedy for OU-2 was no further action with monitoring, with a contingent remedy for limited groundwater pumping followed by treatment and discharge of the groundwater to the county sewer system. The contingent remedy was implemented in 2002.

1.4 Institutional and Engineering Controls

LaBella has reviewed a Draft Site Management Plan (SMP) dated April 2013 for the Site. The SMP describes institutional controls (ICs) and engineering controls (ECs) required for the Site in accordance with the RODs.

ICs required for the Site include the following:

- SMP
- Soil Management Plan and Excavation Work Plan (Appendix H of the SMP);
- Monitoring Plan (Appendix I, J and K of the SMP);
- Operations and Maintenance Plan (Appendix I, J and K of the SMP); and
- Deed Restriction/ Environmental Easement (Appendix D of the SMP).

ECs required for the Site include the following:

- Groundwater Treatment System;
- AS/SVE System;
- Vapor Mitigation System; and
- Fencing/ Access Control.

It is understood the AS/SVE system will be discontinued and decommissioned.

2.0 Objective

The ICs and ECs have been implemented with the exception of the Vapor Mitigation System. Following discontinuation of the AS/SVE system operation a Vapor Mitigation System is required to be installed within the Site Buildings as an EC in accordance with the SMP.

Typical vapor mitigation systems include a sub-slab depressurization system (SSDS). A SSDS is very similar to a radon system in that it creates negative pressure under the floor slab, which removes vapors from beneath the slab and mitigates the potential for vapors from entering the indoor air space. The objective of this work plan is as follows:

- To install a SSDS capable of creating negative pressure beneath the building floor slabs.

3.0 Standards, Criteria and Guidelines

This section identifies the Standards, Criteria and Guidelines (SCGs) for vapor intrusion at the Site. The SCGs utilized as part of the implementation of this SSDS Work Plan are identified below:

- **Sub-Slab Soil Vapor and Indoor Air SCGs:** The NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* dated October 2006 with subsequent updates is utilized for the SCG for soil vapor and indoor air.

4.0 Sub-Slab Depressurization System Design

4.1 SSDS Pilot Test

LaBella retained Mitigation Tech to conduct a pilot test in order to design a SSDS for the Site Buildings. The purpose of the Pilot Test was to evaluate the air communication beneath the building to determine the approximate number of depressurization points and fans required to create a pressure differential

of 0.004 inches of water column ("wc) beneath the Site Buildings. Mitigation Tech applied a vacuum to existing SVE piping and newly created depressurization points and measured sub-slab pressure at varying distances from the vacuum via small diameter (0.5-inch) test holes. The following subsections provide design details based on the Pilot Test. It should be noted the design is subject to change if during installation modifications are required to achieve the required pressure differential and/or based on building layout.

4.2 System Overview

The SSDS will be installed in substantial accordance with the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* dated October 2006 and subsequent updates. The majority of the system will be constructed of Schedule 40 polyvinyl chloride (PVC) piping and fittings which shall conform to ASTM D3034. Due to building partitions and separate footer systems, it is currently anticipated four (4) separate systems will be installed (refer to Figure 3). Each individual SSDS will consist of one (1) or more depressurization points. Systems with multiple points will be manifolded together horizontally in the building's ceiling (refer to Figure 3). Pressure field extension (PFE) monitoring points will also be installed in the building floor slab during the installation of the SSDS to measure sub-slab pressure; however, these points will be sealed subsequent to system installation and confirmation of the radius of influence. During system installation, reasonable efforts will be made to ensure cracks in the floor and floor penetrations are sealed.

4.3 Piping Network

Each depressurization point will consist of a vertical 2 or 3-inch diameter Schedule 40 PVC pipe which will be manifolded into a horizontal 3 or 4-inch Schedule 40 PVC pipe (a lateral) located in the ceiling. The depressurization points will be installed by coring a 5-in. diameter hole in the concrete floor slab. Approximately one (1) cubic ft. of void space will be created directly under the cored area by removing material beneath the slab through the corehole. This material will be containerized for future characterization and disposal at an appropriate facility. The PVC pipe will then be lowered into the corehole so the bottom of the pipe is flush with the bottom of the floor slab. At that point, the PVC will be sealed into the concrete floor slab using urethane caulk and backer rod to ensure that a vacuum is created during system operation. Piping will be attached to walls and ceilings via brackets and pipe hangers. Depressurization points will be installed against interior walls and/or columns. All locations are approximate and subject to property owner approval. Trenching may be required along footers; concrete will be restored. Approximately eight (8) depressurization points are anticipated (refer to Figure 3).

4.4 Fan Installation

The Pilot Test determined the need for four (4) separate systems due to building partitions and footer systems. The following fans are anticipated (refer to Figure 3 for system locations).

- System 1- 190 Anderson Ave- RADONAWAY RP-265 fan with 2 suction cavities
- System 2- 192-200 Anderson Ave (West)- RADONAWAY GP-501 fan with 2 suction cavities
- System 3- 192-200 Anderson Ave (East)- FESTA Force fan with 3 suction cavities
- System 4- 220 Anderson Ave (East)- FESTA Force fan with 1 suction cavity

Each fan will be installed outside the building on the northern exterior wall via 3 or 4-inch schedule 40 PVC pipe terminating above the roof line. The exhaust points will be at least 10-feet from any air intake, 1-ft above the roofline and 10-feet from any opening that is less than 2-feet below the exhaust point (refer to Figure 4).

The fans will be connected to the nearest electrical panel on their own circuit. A vacuum gauge will be installed on the suction side of each fan to indicate the pressure within the vertical riser piping. In addition, a visible and audible alarm will be installed on the suction side of each fan that will alert

building occupants if the system loses pressure. A label will be fixed to the vertical riser in the vicinity of the alarm with contact information of who to contact should the alarm be activated. A Construction Completion Report (CCR) will be provided to the owner along with operational instructions.

4.5 System Startup and Testing

A backdraft test will be completed upon system startup. Pressure field extension testing will be completed following startup via ½-inch diameter pressure monitoring points to ensure a pressure differential between the indoor air and sub-slab of -0.004 "wc is achieved across the all areas of the Site Buildings. PFE readings will be documented in the CCR.

Following continuous operation of the SSDS for a minimum of 30 days, indoor air testing will be conducted to confirm the system is adequate in preventing VOCs from entering the indoor air at concentrations above NYSDOH criteria. An indoor air sample will be collected from within each of the four (4) systems. Samples will be collected using 1-liter Summa canisters over an approximate 8-hour timeframe. An outdoor air and associated matrix spike/ matrix spike duplicate and blind duplicate will be collected for quality control purposes. Sampling will be conducted in accordance with the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* dated October 2006 and subsequent updates. A building inventory will be completed during sample collection. Based on the SVE system being discontinued, it is assumed that VOC concentrations of the effluent are minimal and sampling the effluent from the fans is not required.

Samples will be analyzed for VOCs via USEPA Method TO-15. The laboratory reports will be provided as an ASP Category B-like deliverable data package. A data usability summary report (DUSR) will be prepared in accordance with DER-10 Appendix 2B for all sampling results.

4.6 Health and Safety and Community Air Monitoring

LaBella's Health and Safety Plan (HASP) for this project is included as Appendix 1. The NYSDOH Generic Community Air Monitoring Plan (CAMP) and Fugitive Dust and Particulate Monitoring is included as Appendix 2. All ground intrusive work will be conducted within the building and thus upwind and downwind air monitoring will not take place. Rather, a background reading for VOCs and fugitive dust will be established at each work area prior to conducting any subsurface penetrations and then monitoring will be conducted within the work zone (approximate 5-ft. radius area around floor penetration). The action levels will be applied to the edge of the work zone. Subsequent to subsurface work at the end of each work day, a reading for VOCs will be recorded to confirm background levels have been established.

5.0 Schedule and Deliverables

Implementation of the SSDS Work Plan is anticipated to begin within 45 days after NYSDEC approval of this Work Plan, pending contractor availability. Installation of the SSDS is anticipated to require 30 days to complete. A CCR will be completed documenting the system installation, including as-built drawings and pressure field extension testing results and submitted to NYSDEC and NYSDOH.

FIGURES

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ANDERSON ACQUISITIONS, LLC

FORMER DAVIS HOWLAND OIL CORPORATION SITE
190-220 ANDERSON AVENUE
ROCHESTER, NEW YORK

NYSDEC SITE NO. 8-28-088

SUB-SLAB DEPRESSURIZATION SYSTEM WORK PLAN

SITE LOCATION WITH USGS 7.5-MINUTE TOPOGRAPHIC QUADRANGLE

2171609

FIGURE 1

Path: I:\Anderson Acquisitions LLC\2171609 - 190 Anderson Ave SSDS\Drawings\SSDS Work Plan\Figure 1 - USGS Site Loc (IPJ 2018-02-22).mxd

Notes:
1) The aerial photo basemap is dated 2015, and was downloaded from NYS Orthos Online (https://orthos.dhses.ny.gov/).
2) Property boundaries obtained from Monroe County and are approximate.

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FORMER DAVIS HOWLAND OIL CORPORATION SITE
190-220 ANDERSON AVENUE
ROCHESTER, NEW YORK

NYSDEC SITE NO. 8-28-088

SUB-SLAB DEPRESSURIZATION SYSTEM WORK PLAN

SITE LAYOUT

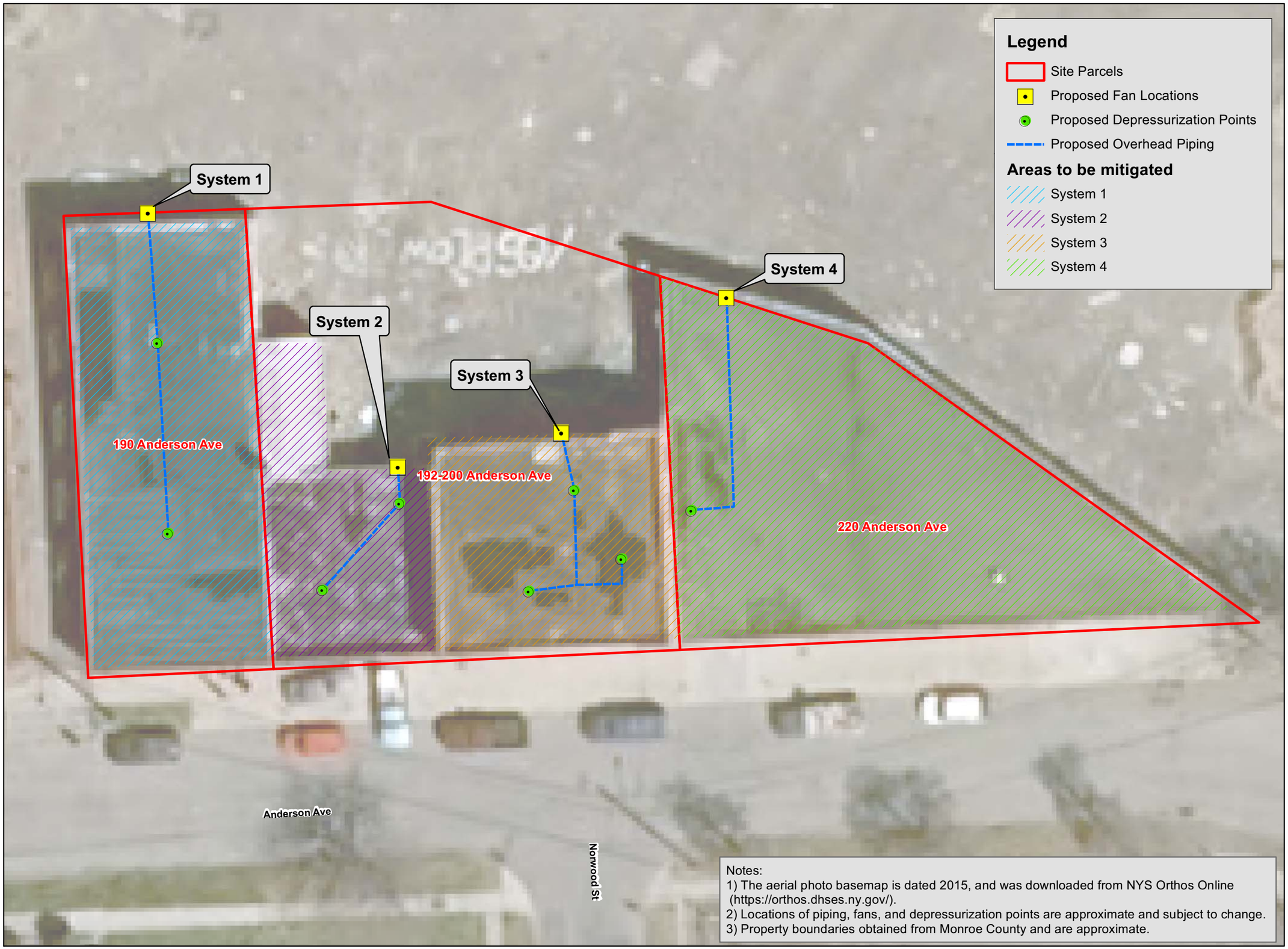
N
W E
S

0 40 Feet
1 inch = 40 feet

2171609

FIGURE 2

Path: I:\Anderson Acquisitions LLC\2171609 - 190 Anderson Ave SSDS\Drawings\SSDS Work Plan\Figure 2 - Aerial Site Plan (IPJ 2018-03-26).mxd



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ANDERSON ACQUISITIONS, LLC

FORMER DAVIS HOWLAND OIL CORPORATION SITE 190-220 ANDERSON AVENUE ROCHESTER, NEW YORK

NYSDEC SITE NO. 8-28-088

SUB-SLAB DEPRESSURIZATION SYSTEM WORK PLAN

PROPOSED SUB-SLAB DEPRESSURIZATION SYSTEM LAYOUT

STATE OF NEW YORK
DANIEL P. NOLL
No. 081996
LICENSED PROFESSIONAL ENGINEER

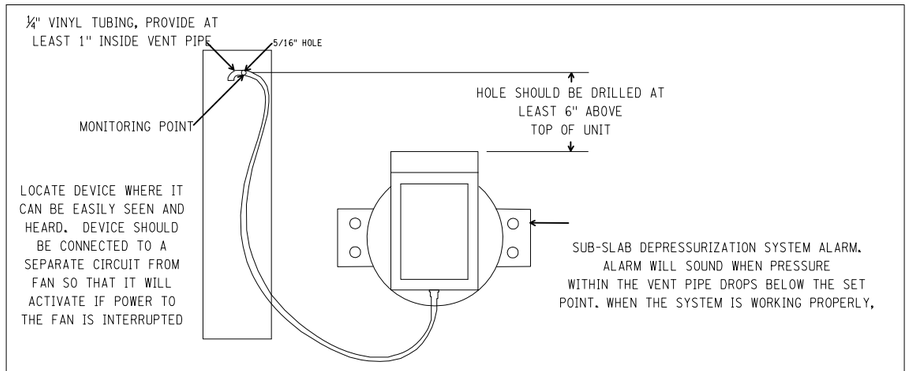
N
W E
S

0 20 Feet
1 inch = 20 feet

2171609

FIGURE 3

Path: I:\Anderson Acquisitions LLC\2171609 - 190 Anderson Ave SSDS\Drawings\SSDS Work Plan\Figure 3 - SSDS Layout Plan (IPJ 2018-03-26).mxd

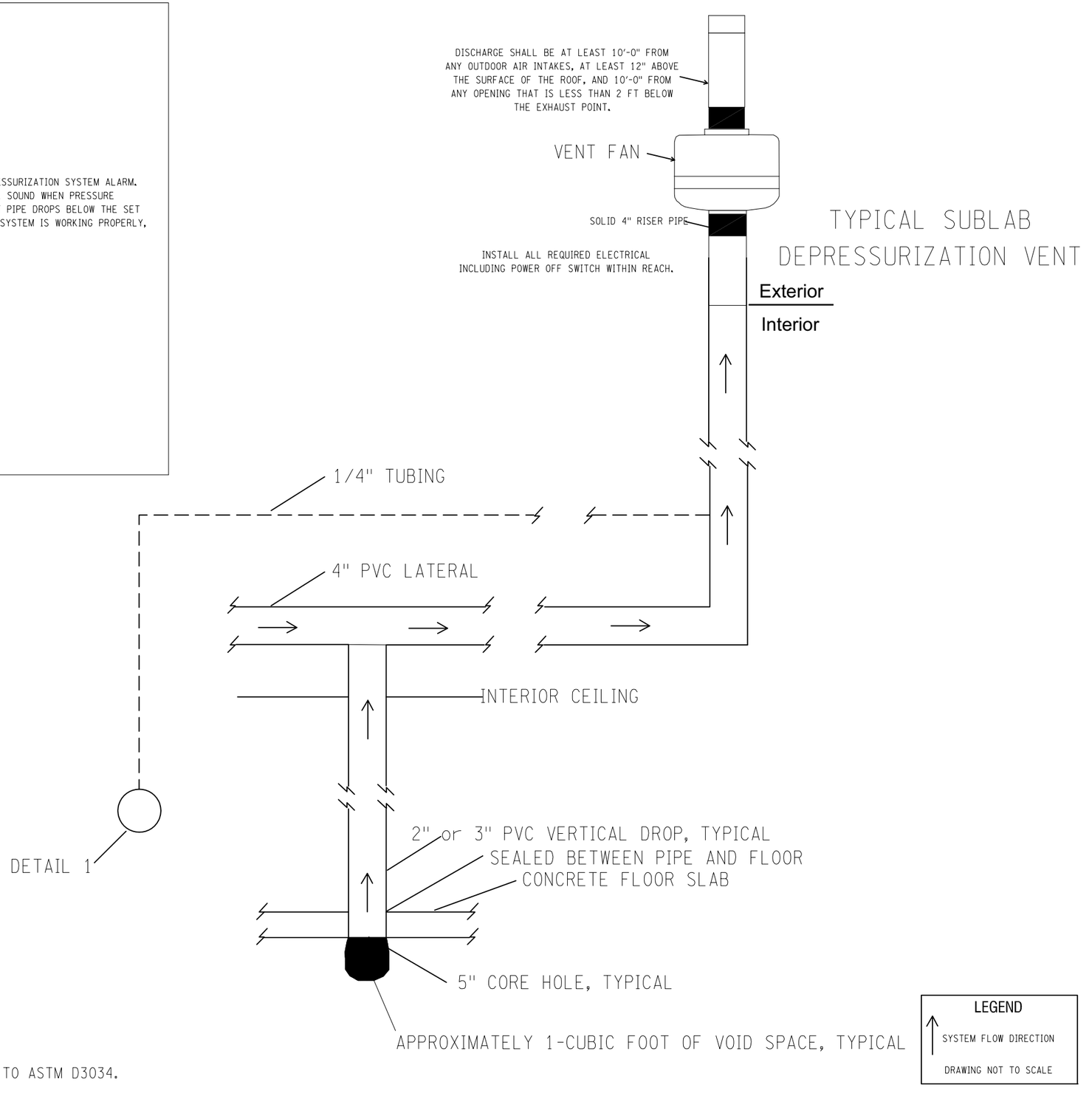


NOTES:

1. PRESSURE SET POINT: -0.25 INCHES WC.
2. PROVIDE ALARM COMPANY LABEL AND CONTACT INFORMATION.

DETAIL 1

SUBSLAB DEPRESSURIZATION SYSTEM ALARM DETAIL



TYPICAL SUBLAB DEPRESSURIZATION VENT

SUBSOIL DEPRESSURIZATION SYSTEM PIPING NOTES:

A. POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS SHALL CONFORM TO ASTM D3034.

LEGEND

SYSTEM FLOW DIRECTION

DRAWING NOT TO SCALE

I:\Anderson Acquisitions LLC\2171609 - 190 Anderson Ave SSDS\Drawings\SSDS Work Plan\Figure 4 - SSDS details

STATE OF NEW YORK DANIEL P. NOLL No. 081998 LICENSED PROFESSIONAL ENGINEER

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PROJECT/CLIENT
FORMER DAVIS-HOWLANDOIL CORPORATION SITE (#828088)

190-220 ANDERSON AVE. ROCHESTER NY

DRAWING TITLE
SUB-SLAB DEPRESSURIZATION SYSTEM DETAILS

ISSUED FOR: FINAL

DESIGNED BY: AA
DRAWN BY: DRP
REVIEWED BY: AA

DATE: March 2018

PROJECT/DRAWING NUMBER
2171609

FIGURE 4

APPENDIX 1

Health and Safety Plan

Site Health and Safety Plan

Location:

190, 192-200 & 220 Anderson Avenue
Rochester, New York 14607

Prepared For:

Anderson Acquisitions, LLC
501 S Clinton Avenue
Rochester, New York 14620

LaBella Project No. 2171609

March 2018

Table of Contents

SITE HEALTH AND SAFETY PLAN

Project Title:	Former Davis-Howland Oil Corporation Site
Project Number:	2171609
Project Location (Site):	190, 192-200 & 220 Anderson Avenue, Rochester NY
Environmental Director:	Gregory Senecal
Project Manager:	Ann Aquilina
Plan Review Date:	March 2018
Plan Approval Date:	March 2018
Plan Approved By:	Mr. Richard Rote, CIH
Site Safety Supervisor:	Daniel Noll
Site Contact:	Thomas Gangemi, Anderson Acquisitions, LLC
Safety Director:	Dave Engert
Proposed Date(s) of Field Activities:	To Be Determined
Site Conditions:	0.43-acres improved with 3 structures
Site Environmental Information Provided By:	❑ Site Management Plan, Ecology and Environment Engineering, PC, April 2013 ❑ Phase II Environmental Site Investigation, Leader Professional Services, Inc., February 16, 2017
Air Monitoring Provided By:	LaBella

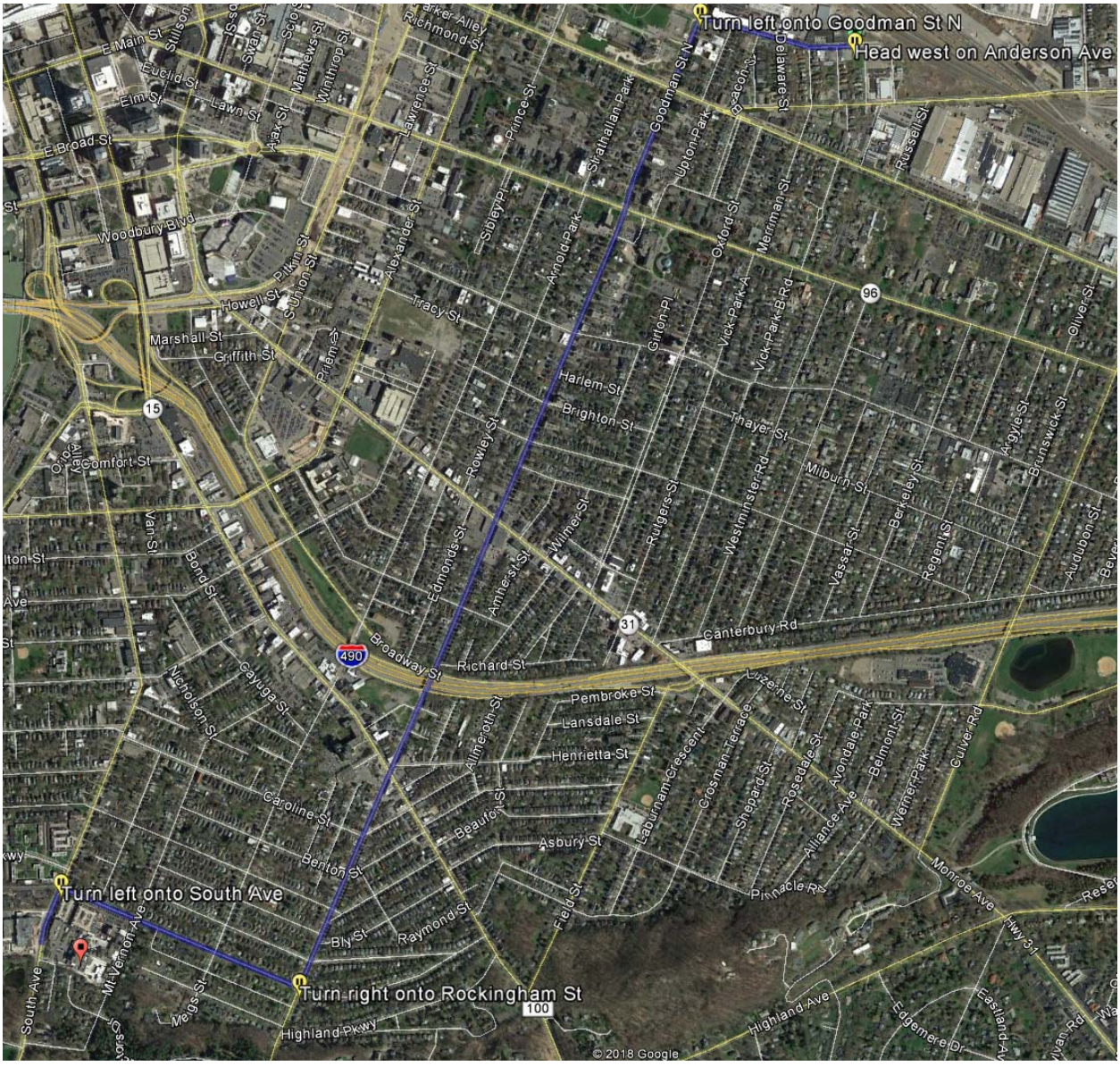
EMERGENCY CONTACTS

	Name	Phone Number
Ambulance:	As Per Emergency Service	911
Hospital Emergency:	Highland Hospital	585-473-2200
Poison Control Center:	Finger Lakes Poison Control	716-275-5151
Police (local, state):	Monroe County Sheriff	911
Fire Department:	Rochester Fire Department	911
Site Contact:	Thomas Gangemi	585-899-9387
Agency Contact:	NYSDEC – Will Welling	518-402-9813
Environmental Director:	Gregory Senecal	585-295-6243
Project Manager:	Ann Aquilina	585-295-6289
Site Safety Supervisor:	Daniel Noll	585-295-6611
Safety Director	Dave Engert	585-295-6630

MAP AND DIRECTIONS TO THE MEDICAL FACILITY
HIGHLAND HOSPITAL - 1000 SOUTH AVENUE

Total Est. Time: 11 minutes **Total Est. Distance:** 2.6 miles

1:	Head west on Anderson Ave	0.3 mi
2:	Turn left on Goodman St N	1.8 mi
3:	Turn left on Rockingham St	0.4 mi
4:	Turn left on South Ave	0.1 mi
5:	End at 1000 South Ave	



1.0 Introduction

The purpose of this Health and Safety Plan (HASP) is to provide guidelines for responding to potential health and safety issues that may be encountered during work at the Former Davis-Howland Oil Corporation Site located at 190-220 Anderson Avenue, City of Rochester, New York ("the Site"). This HASP only reflects the policies of LaBella Associates D.P.C. The requirements of this HASP are applicable to all approved LaBella personnel at the work site. This document's project specifications, and the Community Air Monitoring Plan (CAMP), are to be consulted for guidance in preventing and quickly abating any threat to human safety or the environment. The provisions of the HASP do not replace or supersede any regulatory requirements of the USEPA, NYSDEC, OSHA or other regulatory bodies.

2.0 Responsibilities

This HASP presents guidelines to minimize the risk of injury to project personnel, and to provide rapid response in the event of injury. The HASP is applicable only to activities of approved LaBella personnel and their authorized visitors. The Project Manager shall implement the provisions of this HASP for the duration of the project. It is the responsibility of LaBella employees to follow the requirements of this HASP, and all applicable company safety procedures.

3.0 Activities Covered

The activities covered under this HASP are limited to the following:

- Sub-slab depressurization system installation
- Management of waste generated during subsurface work

4.0 Work Area Access and Site Control

The contractor(s) will have primary responsibility for work area access and site control.

5.0 Potential Health and Safety Hazards

This section lists some potential health and safety hazards that project personnel may encounter at the project site and some actions to be implemented by approved personnel to control and reduce the associated risk to health and safety. This is not intended to be a complete listing of any and all potential health and safety hazards. New or different hazards may be encountered as site environmental and site work conditions change. The suggested actions to be taken under this plan are not to be substituted for good judgment on the part of project personnel. At all times, the Site Safety Officer has responsibility for site safety and his instructions must be followed.

5.1 Hazards Due to Heavy Machinery

Potential Hazard:
Heavy machinery including trucks, drilling rigs, trailers, etc. will be in operation at the site. The presence of such equipment presents the danger of being struck or crushed. Use caution when working near heavy machinery.

Protective Action:

Make sure that operators are aware of your activities, and heed operator's instructions and warnings. Wear bright colored clothing and walk safe distances from heavy equipment. A hard hat, safety glasses and steel toe shoes are required.

5.2 Excavation Hazards

Potential Hazard:
Excavations and trenches can collapse, causing injury or death. Edges of excavations can be unstable and collapse. Toxic and asphyxiant gases can accumulate in confined spaces and trenches. Excavations that require working within the excavation will require air monitoring in the breathing zone (refer to Section 9.0).

Excavations left open create a fall hazard which can cause injury or death.

Protective Action:
Personnel must receive approval from the Project Manager to enter an excavation for any reason. Subsequently, approved personnel are to receive authorization for entry from the Site Safety Officer. Approved personnel are not to enter excavations over 4 feet in depth unless excavations are adequately sloped. Additional personal protective equipment may be required based on the air monitoring.

Personnel should exercise caution near all excavations at the site as it is expected that excavation sidewalls will be unstable. Do not proceed closer than 3 feet to an unsupported or non-sloped excavation side wall.

Fencing and/or barriers accompanied by "no trespassing" signs should be placed around all excavations when left open for any period of time when work is not being conducted.

5.3 Cuts, Punctures and Other Injuries

Potential Hazard:
In any excavation and construction work site there is the potential for the presence of sharp or jagged edges on rock, metal materials, and other sharp objects. Serious cuts and punctures can result in loss of blood and infection.

Protective Action:
The Project Manager is responsible for making First Aid supplies available at the work site to treat minor injuries. The Site Safety Officer is responsible for arranging the transportation of authorized on-site personnel to medical facilities when First Aid treatment in not sufficient. Do not move seriously injured workers. All injuries requiring treatment are to be reported to the Project Manager. Serious injuries are to be reported immediately to the Site Safety Officer

5.4 Injury Due to Exposure of Chemical Hazards

Potential Hazards:
Contaminants identified in testing locations at the Site include various petroleum-related volatile organic compounds (VOCs). Volatile organic vapors, chlorinated solvents or other chemicals may be encountered during subsurface activities at the project work site. Inhalation of high concentrations of volatile organic vapors can cause headache, stupor, drowsiness, confusion and other health effects. Skin contact can cause irritation, chemical burn, or dermatitis.

Protective Action:
The presence of organic vapors may be detected by their odor and by monitoring instrumentation. Approved employees will not work in environments where hazardous concentrations of organic vapors are present. Air monitoring (refer to Section 9.0) of the work area will be performed at least every 60 minutes or more often using a Photoionization Detector (PID). Personnel are to leave the work area whenever PID measurements of ambient air exceed 25 ppm consistently for a 5 minute period. In the event that sustained total volatile organic compound (VOC) readings of 25 ppm are encountered personnel should upgrade personal protective equipment to Level C (refer to Section 8.0) and an Exclusion Zone should be established around the work area to limit and monitor access to this area (refer to Section 6.0).

5.5 Injuries due to extreme hot or cold weather conditions

Potential Hazards:
Extreme hot weather conditions can cause heat exhaustion, heat stress and heat stroke or extreme cold weather conditions can cause hypothermia.

Protective Action:
Precaution measures should be taken such as dress appropriately for the weather conditions and drink plenty of fluid. If personnel should suffer from any of the above conditions, proper techniques should be taken to cool down or heat up the body and taken to the nearest hospital if needed.

6.0 Work Zones

In the event that conditions warrant establishing various work zones (i.e., based on hazards - Section 5.0), the following work zones should be established:

Exclusion Zone (EZ):
The EZ will be established in the immediate vicinity and adjacent downwind direction of site activities that elevate breathing zone VOC concentrations to unacceptable levels based on field screening. These site activities include contaminated soil excavation and soil sampling activities. If access to the site is required to accommodate non-project related personnel then an EZ will be established by constructing a barrier around the work area (yellow caution tape and/or construction fencing). The EZ barrier shall encompass the work area and any equipment staging/soil staging areas necessary to perform the associated work. The contractor(s) will be responsible for establishing the EZ and limiting access to approved

personnel. Depending on the condition for establishing the EZ, access to the EZ may require adequate PPE (e.g., Level C).

Contaminant Reduction Zone (CRZ):
The CRZ will be the area where personnel entering the EZ will don proper PPE prior to entering the EZ and the area where PPE may be removed. The CRZ will also be the area where decontamination of equipment and personnel will be conducted as necessary.

7.0 Decontamination Procedures

Upon leaving the work area, approved personnel shall decontaminate footwear as needed. Under normal work conditions, detailed personal decontamination procedures will not be necessary. Work clothing may become contaminated in the event of an unexpected splash or spill or contact with a contaminated substance. Minor splashes on clothing and footwear can be rinsed with clean water. Heavily contaminated clothing should be removed if it cannot be rinsed with water. Personnel assigned to this project should be prepared with a change of clothing whenever on site.

Personnel will use the contractor's disposal container for disposal of PPE.

8.0 Personal Protective Equipment

Generally, site conditions at this work site require level of protection of Level D or modified Level D; however, air monitoring will be conducted to determine if up-grading to Level C PPE is required (refer to Section 9.0). Descriptions of the typical safety equipment associated with Level D and Level C are provided below:

Level D:
Hard hat, safety glasses, rubber nitrile sampling gloves, steel toe construction grade boots, etc.

Level C:
Level D PPE and full or ½-face respirator and tyvek suit (if necessary). [*Note: Organic vapor cartridges are to be changed after each 8-hours of use or more frequently.*]

9.0 Air Monitoring

According to 29 CFR 1910.120(h), air monitoring shall be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the appropriate level of employee protection required for personnel working onsite. The NYSDOH Generic Community Air Monitoring Plan (CAMP) and Fugitive Dust and Particulate Monitoring is included as Appendix 2. All ground intrusive work will be conducted within the building and thus upwind and downwind air monitoring will not take place. Rather, a background reading for VOCs and fugitive dust will be established at each work area prior to conducting any subsurface penetrations and then monitoring will be conducted within the work zone (approximate 5-ft. radius area around floor penetration). The action levels will be applied to the edge of the work zone. Subsequent to subsurface work at the end of each work day, a reading for VOCs will be recorded to confirm background levels have been established.

10.0 Emergency Action Plan

In the event of an emergency, employees are to turn off and shut down all powered equipment and leave the work areas immediately. Employees are to walk or drive out of the Site as quickly as possible, wait at the assigned 'safe area' and follow the instructions of the Site Safety Officer.

Employees are not authorized or trained to provide rescue and medical efforts. Rescue and medical efforts will be provided by local authorities.

11.0 Medical Surveillance

Medical surveillance will be provided to all employees who are injured due to overexposure from an emergency incident involving hazardous substances at this site.

12.0 Employee Training

Personnel who are not familiar with this site plan will receive training on its entire content and organization before working at the Site.

Individuals involved with the remedial investigation must be 40-hour OSHA HAZWOPER trained with current 8-hour refresher certification.

Table 1
Exposure Limits and Recognition Qualities

Compound	PEL-TWA (ppm)(b)(d)	TLV-TWA (ppm)(c)(d)	STEL (ppm)(b)	LEL (%)(e)	UEL (%)(f)	IDLH (ppm)(g)(d)	Odor	Odor Threshold (ppm)	Ionization Potential
Acetone	750	500	NA	2.15	13.2	20,000	Sweet	4.58	9.69
Anthracene	.2	.2	NA	NA	NA	NA	Faint aromatic	NA	NA
Benzene	1	0.5	5	1.3	7.9	3000	Pleasant	8.65	9.24
Benzo (a) pyrene (coal tar pitch volatiles)	0.2	0.1	NA	NA	NA	700	NA	NA	NA
Benzo (a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (b) Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (k) Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	10.88
Carbon Disulfide	20	1	NA	1.3	50	500	Odorless or strong garlic type	.096	10.07
Chlorobenzene	75	10	NA	1.3	9.6	2,400	Faint almond	0.741	9.07
Chloroform	50	2	NA	NA	NA	1,000	ethereal odor	11.7	11.42
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethylene	200	200	NA	9.7	12.8	400	Acrid	NA	9.65
1,2-Dichlorobenzene	50	25	NA	2.2	9.2		Pleasant		9.07
Ethyl Alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	100	100	NA	1.0	6.7	2,000	Ether	2.3	8.76
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl Alcohol	400	200	500	2.0	12.7	2,000	Rubbing alcohol	3	10.10
Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	500	50	NA	12	23	5,000	Chloroform-like	10.2	11.35
Naphthalene	10, Skin	10	NA	0.9	5.9	250	Moth Balls	0.3	8.12
n-propylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphoric Acid	1	1	3	NA	NA	10,000	NA	NA	NA
Polychlorinated Biphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium Hydroxide	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
p-Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethane	NA	NA	NA	NA	NA	NA	Sweet	NA	NA
Toluene	100	100	NA	0.9	9.5	2,000	Sweet	2.1	8.82
Trichloroethylene	100	50	NA	8	12.5	1,000	Chloroform	1.36	9.45
1,2,4-Trimethylbenzene	NA	25	NA	0.9	6.4	NA	Distinct	2.4	NA
1,3,5-Trimethylbenzene	NA	25	NA	NA	NA	NA	Distinct	2.4	NA
Vinyl Chloride	1	1	NA	NA	NA	NA	NA	NA	NA
Xylenes (o,m,p)	100	100	NA	1	7	1,000	Sweet	1.1	8.56
Metals									
Arsenic	0.01	0.2	NA	NA	NA	100, Ca	NA	NA	NA
Cadmium	0.2	0.5	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	1	0.5	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.05	0.15	NA	NA	NA	700	NA	NA	NA
Mercury	0.05	0.05	NA	NA	NA	28	NA	NA	NA
Selenium	0.2	0.02	NA	NA	NA	Unknown	NA	NA	NA

(a) Skin = Skin Absorption
(b) OSHA-PEL Permissible Exposure Limit (flame weighted average, 8-hour): NIOSH Guide, June 1990
(c) ACGIH – 8 hour time weighted average from Threshold Limit Values and Biological Exposure Indices for 2003.
(d) Metal compounds in mg/m3
(e) Lower Exposure Limit (%)
(f) Upper Exposure Limit (%)
(g) Immediately Dangerous to Life or Health Level: NIOSH Guide, June 1990.

Notes:
1. All values are given in parts per million (PPM) unless otherwise indicated.
2. Ca = Possible Human Carcinogen, no IDLH information.

APPENDIX 2

Community Air Monitoring Plan

APPENDIX 1A

New York State Department of Health
Generic Community Air Monitoring Plan

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 volatile organic compounds (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 NYSDEC/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. "Periodic" 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. 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.

- 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.

- 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.

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

All 15-minute readings must be recorded and be available for State (DEC and DOH) 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.

- 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.

- 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.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.