Lake Ontario Mariner's Marina

JEFFERSON COUNTY, NEW YORK

Site Management Plan

NYSDEC Site Number: V00585

Prepared for:
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One West Main Street
Rochester, New York 14614

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Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date

MAY 2018

MAY 2018

CERTIFICATION STATEMENT

I DANIEL P. NOLL certify that I am currently a NYS registered professional engineer and that this Site Management 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).

_____ P.E.

5/25/18 DATE

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LIST OF ACRONYMS

AS	Air Sparging
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CAMP	Community Air Monitoring Plan
C/D	Construction and Demolition
CFR	Code of Federal Regulation
CLP	Contract Laboratory Program
COC	Certificate of Completion
CO2	Carbon Dioxide
CP	Commissioner Policy
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ERP	Environmental Restoration Program
GHG	Green House Gas
GWE&T	Groundwater Extraction and Treatment
HASP	Health and Safety Plan
IC	Institutional Control
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operations and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PID	Photoionization Detector
PRP	Potentially Responsible Party
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Remedial Party
RSO	Remedial System Optimization
SAC	State Assistance Contract
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SMP	Soil Management Plan

SOP	Standard Operating Procedures
SOW	Statement of Work
SPDES	State Pollutant Discharge Elimination System
SSD	Sub-slab Depressurization
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
SVMS	Soil Vapor Mitigation System
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program

EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan:

Site Identification: V00585 Lake Ontario Mariner's Marina

Institutional Controls:	1. The property may be used for commercial/industrial use;	
	2. ICs include: • Compliance with the Deed Restriction and this SMP by the Grantor (the owner) and the Grantor's successors and assigns, i.e., subsequent owner(s); • All ECs must be operated and maintained as specified in this SMP; • All ECs on the Site must be inspected at a frequency and in a manner defined in the SMP; • Groundwater monitoring must be performed as defined in this SMP; and, • Data and information pertinent to management of the Site must be reported to NYSDEC at the frequency and in a manner defined in this SMP.	
	3. All ECs must be inspected at a frequency and in a manner defined in the SMP.	
Engineering Controls:	1. Cover system	
	2. ECs include: • SSDS • AS/SVE	
Inspections:		Frequency
1. Site-wide Inspection		Annually
2. Inspection of the SSDS, AS, and SVE Systems		Annually
Monitoring:		
2. Groundwater Sampling		Semi-annual for two (2) years

Reporting:	
1. Groundwater Data	Semi-annual for two (2) years
2. Periodic Review Report	Annually

Further descriptions of the above requirements are provided in detail in the latter sections of this Site Management Plan.

1.0 INTRODUCTION

This Site Management Plan (SMP) document is a required element of the remedial program for the former underground petroleum bulk storage tank (UST) area of Lake Ontario Mariner's Marina, including the adjoining land beneath the on-Site building (hereinafter referred to as the "Site"). The Site is currently in the New York State (NYS) Voluntary Cleanup Program (VCP) Site No. V00585 which is administered by New York State Department of Environmental Conservation (NYSDEC). The Site was remediated by Upstate National Bank NA (UNB) in accordance with Voluntary Cleanup Agreement (VCA) #A4-0463-0602, which was executed on August 16, 2002.

1.1 General

UNB entered into the VCA with the NYSDEC to remediate a petroleum discharge detected on the property of Lake Ontario Mariner's Marina (then known as "Henderson Harbor Mariner's Marina"). Initially, all approximately 8.4 acres of marina property were placed into the VCA; however, based on the evidence of impairment identified in the Site investigations, the VCA Site was modified to encompass only the 0.274-acre petroleum-impacted area as shown on the survey maps included in Appendix B. The VCA required UNB to investigate and remediate any petroleum contaminated media at the Site. Depictions of the Site's location and boundaries are provided in Figure 1 and 2. The boundaries of the Site are also more fully described in the metes and bounds description included in Appendix B.

After implementation of the Remedial Alternatives Analysis/Remedial Action Work Plan (RAA/RAWP; submitted under separate cover) and described more fully in Section 1.4 of this SMP, some residual contaminants remained in place in the subsurface at the Site (Residual Contaminants). This SMP was prepared to manage those Residual Contaminants. All reports associated with the Site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by LaBella Associates, D.P.C. ("LaBella"), on behalf of UNB, in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated May, 2010, and other guidelines provided by the

NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) that are required to keep conditions at the Site protective of its commercial/industrial use.

The ICs/ECs are made legally applicable to the Site by the Declaration of Covenants and Restrictions dated March, 27, 2018 (Deed Restriction) attached to this SMP as Appendix L.

The Site contains Residual Contaminants left after completion of the remedial action. ECs have been incorporated into the Site remedy to control exposure to those Residual Contaminants during the continued commercial/industrial use of the Site to ensure protection of public health and the environment. The ICs place restrictions on Site use, and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs.

The Deed Restriction granted to the NYSDEC, and recorded with the Jefferson County Clerk, requires compliance by the owner(s) of the Site with this SMP, and all ECs and ICs placed on the Site. This SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the Deed Restriction for the Residual Contaminants that remain at the Site. This plan has been approved by the NYSDEC, and may only be revised with the approval of the NYSDEC.

This SMP provides a detailed description of all procedures required to manage the Residual Contaminants at the Site, including: (1) implementation and management of all ECs and ICs; (2) media monitoring; (3) operation and maintenance of all treatment, collection, containment or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations.

To address these needs, this SMP includes three plans: (1) an Engineering and Institutional Control Plan for implementation and management of ECs/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual for complex systems).

This plan also includes a description of Periodic Review Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the Site-specific implementation procedures that are required of the owner(s) by the Deed Restriction. Failure to properly implement the SMP is a violation of the VCA and the Deed Restriction, and is grounds for revocation of the Release and Covenant not to Sue;
- Failure to comply with this SMP may also be a violation of Environmental Conservation Law, 6 NYCRR Part 375 and the VCA (Index #A4-0463-0602; Site #V00585) for the Site and; therefore, may also be subject to penalties.

1.2 Revisions

Revisions to this SMP will be proposed in writing to the NYSDEC's project manager. The NYSDEC will provide a written notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the VCA, 6NYCRR Part 375 and/or Environmental Conservation Law.
- 7-day advance notice of any field activity associated with the remedial program.
- 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days

describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the Voluntary Cleanup Agreement (VCA), and all approved work plans and reports, including this SMP.
- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table 1 on the following page includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix F.

Table 1: Notifications*

Name	Contact Information
Peter Ouderkirk	(315) 785-2523 psouderk@gw.dec.state.ny.us
Peter Taylor	(315) 785-2513 Peter.Taylor@dec.ny.gov
Kelly Lewandowski	518-402-9553 Kelly.Lewandowski@dec.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS/REMEDIAL ACTIONS

2.1 Site Location and Description

The tax map parcel upon which the Site is located is in the hamlet of Henderson Harbor, County of Jefferson, New York and is identified as Block 0001 and Lot 014.22 on the Town of Henderson Tax Map #105. The Site is an approximately 0.274-acre area bounded by Henderson Harbor (i.e., Lake Ontario) to the north, east and west, and by the southern wall of the on-Site building to the south (see Figure 2). The boundaries of the Site are more fully described in Appendix B – Metes and Bounds.

2.2 Site History

The Site initially consisted of approximately 8.4 acres of land that currently serves as a marina with a capacity of approximately 120 boats. Based on the locations of investigative points and evidence of impairment identified in previous investigations at the Site, the VCA was modified to limit the Site to a 0.274 acre portion of the initial 8.4 acre Site comprised of the UST area where petroleum was discharged, and the land beneath the on-Site building, where some of that petroleum came to be located.

Site developments include a small slab-on-grade 'Marina Building' located toward the southern end of the Site (i.e., the 0.274 acre area). This structure contains a customer lounge area, a small office area, and a maintenance area where boat repair activities are

conducted. The maintenance area is divided into two bays that contain many minor boat repair related products/equipment including a parts washer, gasoline and other petroleum containers, and a 55-gallon drum to store water that is used to test-run outboard motors. The structure transitions from the maintenance area to a series of off-Site covered boat slips in a southerly direction. The Site, including the Marina Building, is at the northern end of an earthen 'peninsula' with a perimeter reinforced with sheet piling. These Site features are shown on Figure 2.

The Site is zoned as "Harbor" and its designated use is commercial. The surrounding parcels are zoned for a combination of residential and commercial uses. Based on previous environmental assessments of the Site, activities that led to contamination of the Site include discharges from four (4) USTs and ancillary equipment used to fill boats, use of an aboveground storage tank (AST) for waste oil and a gasoline spill that occurred in August of 2000.

Several investigations have been conducted at the Site including:

- A *Phase I Environmental Site Assessment* (ESA) conducted in October 2001 by Passero Associates that identified four (4) USTs and one (1) open NYSDEC Spill (No. 0006488) due to an overfill of gasoline for a personal vehicle.
- A *Limited Phase II ESA* was conducted by Environmental InSite, Inc. in April 2002 that included the installation of eleven (11) soil borings. These borings were converted to temporary monitoring wells. Sampling confirmed the presence of petroleum contaminated soil and groundwater.
- An *Expanded Site Investigation Report* was completed by pHA Environmental Restoration, Inc. in December 2005 that included installing ten (10) new groundwater monitoring wells. Petroleum-related volatile organic compound (VOC) impacts were determined to be contained to the source area soils and surficial aquifer on the peninsula surrounded on three (3) sides by Lake Ontario. Migration to Lake Ontario and/or to the southwest towards the mainland area was not suspected.

- An *Interim Remedial Measure (IRM) Report* was completed by LaBella in March 2010 that detailed the removal and off-Site disposal of 436.22 tons of petroleum-impacted soil and five (5) orphan USTs that contributed contamination to the Site. The impacted soil and USTs were located within the previously described peninsula area of the Project Site. Analytical results associated with excavation closure samples and post-IRM groundwater sampling indicated that the source area had been removed and only residual concentrations of VOCs were detected within soil and groundwater. These residual impacts were left in-place during the IRM due to the presence of the Marina Building and to maintain the integrity of the surrounding sheet piling.
- A Remedial Investigation (RI) Report was completed by LaBella in January 2011. The findings of the RI Report are presented in Section 1.3.

The locations of the former USTs, soil removal area, and post-IRM groundwater monitoring wells are shown on Figure 3.

2.3 Geologic Conditions

The majority of the Site is comprised of up to nine (9) feet of fill consisting of fine to coarse grained sand and gravel underlain by silt with little sand. Groundwater levels are essentially the same as the level of Lake Ontario. The slab of the on-Site Marina Building and surrounding grade ranges from 2.4 to 4.5 feet above the average Lake level. Groundwater levels correspond to and fluctuate with Lake levels, and have generally been measured between 2.72 and 5.31 feet below ground surface. Groundwater predominantly flows radially toward the Lake from the center of the peninsula area; however, based on observations during the IRM, the sheet pile wall system appears to be acting as an effective barrier preventing flow from the lake/basin to the interior of the sheet pile wall system.

3.0 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

The results of the RI are set forth in detail in the *Remedial Investigation Report, NYSDEC VCA Index #4A-0463-0602*, dated January 2011, prepared by LaBella. Generally, the RI characterized the nature and extent of contaminants of concern at the Site as follows:

- The primary contaminants of concern are VOCs and semi-volatile organic compounds (SVOCs) related to the historic discharges of petroleum contamination from five (5) USTs and associated piping to the north of the Marina Building.
- The petroleum contamination related to the former USTs has not migrated significantly to the south or west, however Residual Contaminants remain beneath the Marina Building.
- The removal of the previous USTs and associated impacted soils during the IRM remedial work was effective at eliminating the source area of contamination at the Site.
- There does not appear to be residual impacts to soil above the Soil Cleanup Objectives (SCO) beneath or to the west of the Marina Building. However, residual groundwater impacts have been identified along the perimeter of the sheet piling system, beneath the northern portion of the Marina Building, and immediately to the west of the Marina Building (refer to Figure 4). Residual soil impacts also exist to the north of the Marina Building.
- Groundwater concentrations of VOCs have generally decreased subsequent to the IRM soil/source removal.
- Groundwater results indicate that there is not another source area beneath the Marina Building.

Residual impacts to soil and groundwater in the vicinity of the IRM excavation are being addressed with an air sparge and soil vapor extraction system, sub-slab depressurization system (SSDS) and natural degradation and attenuation over time.

4.0 SUMMARY OF REMEDIAL ACTIONS

The Site was remediated in accordance with the NYSDEC-approved Remedial Alternatives Analysis & Remedial Action Work Plan dated April 2013.

The following is a summary of the Remedial Actions performed at the Site:

1. Removal of five (5) orphan USTs and approximately 436.22-tons of petroleum-impacted soil from the portion of the Site to the north of the Marina Building as an IRM in late 2009.

2. Installation of a SSDS in the Marina Building, located immediately south of the IRM excavation in May 2014.

3. Installation and start-up of an air sparging system and a soil vapor extraction system. Subsurface components of these systems were installed during the 2009 IRM. Remaining components were installed during the summer of 2014.

4. Maintenance of the existing soil cover system consisting of building foundations, pavement, sidewalks, and soil to prevent human exposure to the Residual Contaminants at the Site;

5. Execution and recording of a Deed Restriction to restrict land use and manage future exposure to any Residual Contaminants remaining at the Site.

6. Development and implementation of this SMP for long term management of Residual Contaminants, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

Remedial activities were completed at the Site between 2009 and 2014.

4.1 Removal of Contaminated Materials from the Site

In accordance with the NYDEC-approved IRM Work Plan, 436.22 tons of petroleum impacted soil and five (5) orphan USTs were removed from the peninsula area to the north of the Marina Building. To determine the effectiveness of the contamination removal activities, confirmation soil samples were collected. Of the nine (9) confirmation soil samples collected, three (3) were reported to contain VOCs at concentrations above the SCO for the Protection of Groundwater. These samples were collected from the eastern sidewall, northern sidewall, and bottom of the excavation. The former USTs, IRM excavation area, and confirmation sample locations are shown on Figure 3.

4.2 Site-Related Treatment Systems

- A SSDS was installed to mitigate the potential for soil vapor intrusion in the Marina Building based on the presence of residual soil and groundwater

impacts left in-place during the IRM due to the location of impacts beneath the building footprint. As-built drawings of the SSDS are included in Appendix C.

- Air sparge (AS) and soil vapor extraction (SVE) systems were installed to address residually impacted groundwater within and surrounding the former source area. The air injection wells are installed in the source removal area to a depth of approximately 5-8 ft below grade, which is approximately 3 ft below the average water table depth. The AS system pumps ambient air into the areas with Residual Contaminants to enhance natural degradation of petroleum compounds. The horizontal SVE system captures the volatilized contaminants. As-built drawings of the AS and SVE systems are included in Appendix C.

4.3 Residual Contaminants

This SMP is required due to one (1) area at the Site that was identified with elevated concentrations of VOCs beneath the soil cover system where soil and groundwater have not yet been remediated to unrestricted levels. The applicable data tables from the Interim Remedial Measure Report, dated March 15, 2010 that provide these results and the applicable mapping from the Interim Remedial Measure Report that provide the location of these samples are included in Appendix D. Groundwater results from samples collected following the IRM activities are also included in Appendix D.

5.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

5.1 Introduction

5.1.1 General

Since Residual Contaminants remain in the soil, groundwater, and soil vapor beneath the Site, Engineering Controls and Institutional Controls (ECs/ICs) are required to protect human health and the environment. This Engineering and Institutional Control Plan (EC/IC Plan) describes the procedures for the implementation and management of all ECs/ICs at the Site. The EC/IC Plan is one component of the SMP and is subject to revision by NYSDEC.

5.1.2 Purpose

This plan provides:

- A description of all ECs/ICs on the Site;
- The basic implementation and intended role of each EC/IC;
- A description of the key components of the ICs set forth in the Deed Restriction;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of ECs/ICs, such as the implementation of an Excavation Work Plan for the proper handling of any Residual Contaminants that may be disturbed during maintenance or redevelopment work on the Site; and
- Any other provisions necessary to identify or establish methods for implementing the ECs/ICs required by the Site remedy, as determined by the NYSDEC.

5.2 ENGINEERING CONTROLS

5.2.1 Engineering Control Systems

5.2.1.1 Soil Cover

Exposure to Residual Contaminants in soil/fill at the Site is prevented by a soil cover system over the Site. This cover system is comprised of a minimum of 12 inches of clean soil, or asphalt pavement, concrete-covered sidewalks and concrete building slabs. The Excavation Work Plan that appears in Appendix A outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying Residual Contaminants are disturbed. Procedures for the inspection and maintenance of this cover are provided in the Monitoring Plan included in Section 3 of this SMP.

5.2.1.2 Sub-slab Depressurization System

An active Sub-slab Depressurization System (SSDS) was installed at the Site beneath the Marina Building. The as-built construction figures are included in Appendix C. Specifics for the SSDS are provided below:

- The active SSDS was installed in substantial accordance with New York State Department of Health guidance entitled in the *Guidance for Evaluating Soil Vapor Intrusion in the State of New York,* dated October 2006.
- The active SSDS consists of two (2) solid PVC risers extending from the base of the floor slab to a space between the ceiling and the roof. Here the risers are connected to PVC headers with in-line fans. The headers are manifolded together and routed to an exhaust point on the exterior of the building. Additional SSDS details are shown on the as-built drawings in Appendix C. The system achieves a negative pressure differential beneath the entire floor slab. The SSDS will remain active (fans on) pending further testing. The system will not be deactivated without NYSDEC approval.
- The suction (vacuum) side of each vertical piping run (i.e., below the fan) is tapped with ¼-inch tubing that connects to an alarm (audible and visual). In the event that the vacuum is lost (e.g., fan failure), the alarm will be tripped indicating that the system is down.
- A U-Tube Manometer is located on the suction side of each vertical riser pipe for confirmation of proper system operation, (i.e., negative pressure).

Procedures for monitoring the system are included in the Monitoring Plan (Section 3 of this SMP). Procedures for operating and maintaining the active SSDS are documented in the Operation and Maintenance Plan (Section 4 of this SMP). The Monitoring Plan also addresses severe condition inspections in the event of a severe condition, which may affect controls at the Site.

5.2.1.3 Air Sparging/Soil Vapor Extraction Systems

AS has been implemented as shown on Figure 5 to address the groundwater plume contaminated by VOCs. Air is injected into the saturated zone in the subsurface,

enhancing natural volatilization of VOCs. The VOCs are carried in the vapor phase into the vadose zone where a SVEsystem has been installed to create a preferential pathway for this vapor to travel and to pull vapors from the subsurface.

- The AS system consists of six (6) air injection wells installed in the source removal area, each screened to a depth of approximately 5-8 feet below grade.
- The infrastructure consists of 1-in. diameter vertical pipes connected via 1-in. diameter horizontal piping to the northern extent of the Marina Building. The vertical sparge points are screened below the residually impacted soils and groundwater.
- The AS system is designed to cycle on and off between "banks" of two sparge points, for a total of three banks.
- A pilot study was conducted to evaluate the size of compressor needed for the system and to calculate the most effective cycle durations. Based on the results of the pilot study, an Air Sparge Skid 2951 with a Becker DT4.10-4.40 Series compressor was selected and installed. The compressor was customized to allow pulsing between the three sparge point banks. General specifications of the system are included in Appendix C. The compressor is designed to operate by pushing air alternatively into the three sparge point banks (each bank consisting of two points) at intervals of 55 minutes for points 1 and 2, and 80 minutes each for points 3 and 4 and points 5 and 6. Additional information regarding the pilot study can be found in the FER, submitted to the NYSDEC under separate cover.
- The SVE system consists of two sets of 4-in. diameter perforated piping which were installed horizontally around the perimeter of the IRM excavation prior to backfill. The two sets of 4-in. diameter piping were installed to depths of approximately 2-ft. and 5-ft. bgs, respectively. The horizontal pipes connect to vertical 4-in. PVC risers adjacent to the northern side of the Marina Building and terminate 2-ft. above the Building's roofline. Passive 4" turbine fans are installed on each of the two SVE discharge pipes. Refer to the as-built drawing in Appendix C for additional SVE system details.

5.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the Decision Document. Guidance for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10.

5.2.2.1 Composite Cover System

The composite cover system is a permanent EC, so the quality and integrity of this system must be inspected annually in perpetuity.

5.2.2.2 Sub-slab Depressurization System

The active Sub-slab Depressurization System (SSDS) is an EC which is anticipated to be discontinued when no longer needed to prevent vapor intrusion into the Marina Building. However, the SSDS will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the SSDS is no longer required, a proposal to discontinue the SSDS must be submitted by the property owner to the NYSDEC and NYSDOH for final determination.

5.2.2.3 Air Sparging/Soil Vapor Extraction System

The AS/SVE systems are ECs which are anticipated to be discontinued when no longer needed to address Residual Contaminants in the groundwater. The AS/SVE systems, however, will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the AS/SVE systems are no longer required, a proposal to discontinue the systems will be submitted by the property owner to the NYSDEC. Conditions that warrant discontinuing the AS/SVE systems include contaminant concentrations in groundwater that: (1) reach levels that are consistently below ambient water quality standards, (2) have become asymptotic to a low level over an extended period of time as accepted by the NYSDEC, and/or (3) the NYSDEC has determined that the AS/SVE systems have reached the limit of their effectiveness. This assessment will be based in part on post-remediation contaminant levels in groundwater collected from monitoring wells located throughout the Site. The AS/SVE systems will remain in place and operational until permission to discontinue their use is granted in writing by the NYSDEC.

5.3 INSTITUTIONAL CONTROLS

A series of ICs are required by the Decision Document to: (1) implement, maintain and monitor ECs; (2) prevent future exposure to Residual Contaminants by controlling disturbances of the subsurface contamination; and (3) limit the use and development of the Site to commercial/industrial uses. Adherence to these ICs at the Site is required by the Deed Restriction attached hereto in Appendix L and will be implemented under this SMP. These ICs are:

- Compliance with the Deed Restriction and this SMP by the Grantor (the owner) and the Grantor's successors and assigns, i.e., subsequent owner(s);
- All ECs must be operated and maintained as specified in this SMP;
- All ECs on the Site must be inspected at a frequency and in a manner defined in the SMP;
- Groundwater monitoring must be performed as defined in this SMP; and,
- Data and information pertinent to management of the Site must be reported to NYSDEC at the frequency and in a manner defined in this SMP.

ICs identified in the Deed Restriction may not be discontinued without an amendment to or extinguishment of the Deed Restriction.

The Site has a series of ICs in the form of use restrictions. Adherence to these ICs is required by the Deed Restriction. The use restrictions that apply to the Site are:

- The Site may only be used for commercial/industrial use, provided that the long-term ECs/ICs included in this SMP are employed.
- The Site may only be used for commercial/industrial use, and not a higher level of use, such as unrestricted, restricted residential use, or vegetable gardens or farming, without written approval by the NYSDEC;
- All future activities on the Site that will disturb or excavate any of the Residual Contaminants must be conducted in accordance with this SMP;
- The use of groundwater is prohibited unless necessary water quality treatment has been performed in accordance with NYSDOH guidance and with the approval of the Jefferson County Department of Health, NYSDOH, and the NYSDEC.

- The potential for vapor intrusion must be evaluated for any buildings developed at the Site, and any potential impacts that are identified must be monitored or mitigated;
- The Site owner or UNB will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) ECs/ICs employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow and will be made by a qualified environmental professional that the NYSDEC finds acceptable.

5.3.1 Excavation Work Plan

The Site has been remediated for restricted commercial and industrial use. Any future intrusive work that will penetrate the soil cover, or encounter or disturb the Residual Contaminants, including any modifications or repairs to the existing cover system will be performed in compliance with the Excavation Work Plan (EWP) that is attached as Appendix A to this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) prepared for the Site (included in Appendix F). A model HASP is attached in Appendix F to this SMP and is in general compliance with DER-10, and 29 CFR 1910, 29 CFR 1926, and all other applicable Federal, State and local regulations. Based on future changes to State and federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP may need to be updated and re-submitted with the notification provided in Section A-1 of the EWP. Any intrusive construction work at the Site will be performed in compliance with the EWP, HASP and CAMP, and will be included in the periodic inspection and certification reports submitted under the Site Management Reporting Plan (See Section 5).

The party performing any work which might disturb Residual Contaminants is completely responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of excavation de-water, control of runoff from open excavations into Residual Contaminants, and for structures that may be affected by excavations (such as building foundations and bridge footings). Each such party must

prepare its own Site-specific HASP and CAMP. The owner will ensure that Site development activities will not interfere with, or otherwise impair or compromise, the ECs/ICs described in this SMP.

5.3.2 Soil Vapor Intrusion Evaluation

Prior to the construction of any enclosed structures located over areas that contain Residual Contaminants where the potential for soil vapor intrusion (SVI) has been identified (see Figure 4), an SVI evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system, including without limitation an SSDS, may be installed as an element of the building foundation without first conducting an investigation. At a minimum, a pre-SVI evaluation mitigation system will include a vapor barrier and passive SSDS, i.e., perforated piping manifolded to a vertical exhaust pipe, that is capable of being converted to an active system.

Prior to either conducting a SVI evaluation or installing such a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York" (NYSDOH Guidance). If a SVI evaluation is conducted and concludes that mitigation measures must be employed to mitigate potential vapor intrusion, such mitigation measures will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH Guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will also be transmitted to the NYSDEC and NYSDOH, along with a recommendation for follow-up action, such as mitigation, if necessary and appropriate. Validated SVI data will also be transmitted to the property owner within 30 days of validation if the SVI evaluation is conducted by another party. If any indoor air test results exceed NYSDOH guidelines, relevant NYSDOH fact sheets will be provided to all tenants and occupants of the Site within 15 days of receipt of validated data.

SVI sampling results, evaluations, and follow-up actions will also be summarized in the next Periodic Review Report.

5.4 INSPECTIONS AND NOTIFICATIONS

5.4.1 Inspections

Inspections of all remedial components installed at the Site will be conducted at the frequency specified in the SMP Monitoring Plan schedule (Section 3). A comprehensive Site-wide inspection will be conducted annually, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether the ECs continue to perform as designed;
- Whether the ECs continue to be protective of human health and the environment;
- Compliance with the requirements of this SMP and the Deed Restriction;
- Achievement of remedial performance criteria;
- Sampling and analysis of appropriate media during monitoring events;
- Whether the Site records are complete and up to date; and
- Whether changes have been or need to be implemented to the remedial or monitoring system.

Inspections will be conducted in accordance with the procedures set forth in the Monitoring Plan of this SMP (Section 3). The reporting requirements are outlined in the Periodic Review Reporting section of this SMP (Section 5).

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the Site will be conducted within 5 days of the event to verify the effectiveness of the ECs/ICs implemented at the Site by a qualified environmental professional as determined by NYSDEC.

5.4.2 Notifications

Notifications will be submitted by the property owner to the NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in the use of the Site that are required under the terms of the VCA, 6 NYCRR 375-1.11(d), and/or Environmental Conservation Law.
- 7-day advance notice of any proposed ground-intrusive activities pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundation, structures or another structural component that reduces or has the potential to reduce the effectiveness of an EC and likewise any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of any of the ECs in place at the Site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of any impaired EC.

Any change in the ownership of the Site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective owner has been provided with a copy of the VCA, and all approved work plans and reports, including this SMP
- Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be confirmed to NYSDEC in writing.

5.5 CONTINGENCY PLAN

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

5.5.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance, the owner or the owner's designated representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to UNB. These emergency contact lists must be maintained in an easily accessible location at the Site.

Table 1: Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3 day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Table 2: Contact Numbers

UNB	Gregory Senecal, CHMM, LaBella Associates, D.P.C. (585) 295-6243

* Note: Contact numbers subject to change and should be updated as necessary

5.5.2 Map and Directions to Nearest Health Facility

Site Location: 12548 Eastman Tract, Henderson Harbor, NY

Nearest Hospital Name: Samaritan Medical Center

Hospital Location: 830 Washington Street, Watertown, NY 13601

Hospital Telephone: (315) 785-4000

Directions to the Hospital from the Site:

1: Leave Lake Ontario Mariner's Marina
2: Go NORTHEAST on CR-123 toward ROCKLEDGES SUB. 1.4 miles
3: Turn RIGHT. <0.1 miles
4: Turn LEFT onto NY-3. 5.9 miles
5: Turn RIGHT onto CR-62 / SULPHUR SPRINGS RD. 4.8 miles
6: Turn LEFT onto CR-63 / MASSEY ST RD. and follow CR-63. 4.2 miles
7: CR-63 becomes S MASSEY ST. 0.9 miles
8: Turn SLIGHT RIGHT onto PADDOCK ST. 0.7 miles
9: Turn RIGHT onto WASHINGTON ST / US-11. 0.2 miles
10: End at 830 Washington St Watertown, NY 13601

Total Distance: 18.2 miles

Total Estimated Time: 27 minutes

Map Showing Route from the Site to the Hospital:

5.5.3 Response Procedures

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number

list is found in Table 1 above, which is on page 19 of this SMP. The list at Table 1 will also be posted prominently at the Site and made readily available to all personnel at all times.

6.0 SITE MONITORING PLAN

6.1 Introduction

6.1.1 General

The Site Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate the Residual Contaminants at the Site, the soil cover system, and all affected Site media identified below. Monitoring of other Engineering Controls is described in Chapter 4, Operation, Monitoring and Maintenance Plan. This Site Monitoring Plan may only be revised with the approval of NYSDEC.

6.1.2 Purpose and Schedule

This Site Monitoring Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor, soils);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly, TOGS 1.1.1 ambient groundwater standards and Part 375 SCOs for soil;
- Assessing achievement of the remedial performance criteria.
- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Site Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;

- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Semi-annual monitoring of the performance of the remedy and overall reduction in contamination on-Site will commence approximately six (6) months from the issuance of the VCP Decision Document. Semi-annual monitoring will be conducted for the first two (2) years. The frequency thereafter will be determined by NYSDEC based upon the results of the first two (2) years of monitoring. Trends in contaminant levels in groundwater in the affected area of the Site will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in Table 3 and outlined in detail in Sections 3.2 and 3.3 below.

Monitoring Program	Frequency*	Matrix	Analysis
Groundwater	Semi-annual for two (2) years	Liquid	CP-51 VOCs

Table 3: Monitoring/Inspection Schedule

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH. Following the initial two (2) year sampling period the groundwater analytical results will be discussed with the NYSDEC to assess changes in sampling frequency.

6.2 COVER SYSTEM MONITORING

The soil cover system will be monitored throughout the year by adherence to the Excavation Work Plan. An annual inspection will be conducted by a walk-through inspection of the Site to confirm conditions have not changed throughout the year.

6.3 MEDIA MONITORING PROGRAM

6.3.1 Groundwater Monitoring

Groundwater monitoring will be performed semi-annually for two (2) years on the ten (10) existing groundwater monitoring wells to assess the performance of the remedy. The majority of existing wells were installed by others and well construction logs are not

available; however, LaBella installed MW-12 and MW-13 and these well construction logs are included as Appendix G. The sampling frequency may be modified with the approval of NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by NYSDEC.

The groundwater level at the Site is similar in elevation to Lake Ontario and ranges between 2.5-ft and 3.5 ft bgs at the Site. Groundwater is mounded in the former UST source area and appears to flow radially outwards towards the lake/basin.

The network of monitoring wells has been installed to monitor groundwater conditions throughout the Site. Deliverables for the groundwater monitoring program are specified below.

6.3.1.1 Sampling Protocol

All monitoring well sampling activities will be recorded in a field book and a groundwater-sampling log similar to that presented in Appendix H. Other observations (e.g., well integrity, etc.) will be noted on the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network and will be included with the groundwater monitoring reports.

Low flow groundwater sampling methodologies will be implemented using a peristaltic pump in order to obtain a representative sample of current groundwater conditions at the Site. In order to accomplish this task, the following steps will be taken:

- Initially, static water levels will be collected using a water level measuring device(s) capable of measuring to 0.01 foot accuracy for evaluating the groundwater contours at the Site.
- Subsequent to collecting groundwater elevations, low flow purging of the monitoring wells will include the collection of water quality indicator parameters. Water quality indicator parameters will be recorded at five (5)-minute intervals during the purging of the well. The water quality indicator parameters are:

  - Water Level Drawdown

  - Temperature

- pH

- Dissolved Oxygen

- Specific Conductance

- Oxidation Reduction Potential

- Turbidity

- Groundwater sampling will commence once the groundwater quality indicator parameters have stabilized for at least three (3) consecutive readings for the following parameters:

  - Water Level Drawdown: <0.3’

  - Temperature: +/- 3%

  - pH: +/- 0.1 unit

  - Dissolved Oxygen: +/-10%

  - Specific Conductance: +/-3%

  - Oxidation Reduction Potential: +/-10 millivolts

  - Turbidity: +/-10% for values greater than 1 NTU

- After chemical indicator and drawdown parameters have stabilized, sampling can begin.

- Samples will be collected directly into appropriate laboratory-provided bottleware. Specifically, two (2) 40-mL glass vials containing a hydrochloric acid preservative will be filled with groundwater (with zero headspace) for each sample. The laboratory will place the required volume of preservative in each vial.

- Each sample collected will be properly labeled.

- After collection of the samples, the pump tubing can be dedicated to the well for re-sampling (by hanging the tubing inside the well), decontaminated, or properly discarded.
- The monitoring well will be secured.
- Any reusable low flow groundwater sampling equipment will be decontaminated after each monitoring well prior to sampling additional wells at the Site.
- The samples will be submitted to a NYSDOH Environmental Laboratory Accreditation Program (ELAP) certified laboratory for the parameters tested under chain of custody. Groundwater samples will be analyzed for CP-51 VOCs using USEPA Method 8260C.
- The groundwater results will be provided in an ASP Category B deliverables data package and a Data Usability Summary Report (DUSR) will be completed to evaluate the usability of the data in accordance with DER-10 Appendix 2B.

6.3.1.2 Monitoring Well Repairs, Replacement And Decommissioning

If biofouling or silt accumulation occurs in the on-Site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced, if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic review report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

6.4 SITE-WIDE INSPECTION

Site-wide inspections will be performed regularly a minimum of once a year. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed (Appendix I). The form will compile sufficient information to assess the following:

- Compliance with all ICs, including Site usage;
- An evaluation of the condition and continued effectiveness of all ECs;
- General Site conditions at the time of the inspection;
- The Site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
- Compliance with permits and schedules included in the Operation and Maintenance Plan; and
- Confirm that Site records are up to date.

6.5 MONITORING QUALITY ASSURANCE/QUALITY CONTROL

All sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) prepared for the Site (Appendix J). Main components of the QAPP include:

- QA/QC Objectives for Data Measurement;
- Sampling Program:
    - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
    - Sample holding times will be in accordance with the NYSDEC ASP requirements.
    - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.

- Sample Tracking and Custody;
- Calibration Procedures:
    - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
    - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;
- Preparation of a DUSR, which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and Checks;
- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules;
- Corrective Action Measures.

6.6 MONITORING REPORTING REQUIREMENTS

Copies of the forms and any other information generated during regular monitoring events and inspections will be kept on file on-Site. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be (1) subject to approval by NYSDEC and (2) submitted at the time of the Periodic Review Report, as specified in the Reporting Plan of this SMP (Section 5).

All monitoring results will be reported to NYSDEC on a periodic basis in the Periodic Review Report. A letter report will also be prepared subsequent to each sampling event. The report or letter will include, at a minimum:

- Date of event;
- Personnel conducting sampling;

- Description of the activities performed;
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (o be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether groundwater conditions have changed since the last reporting event.

Data will be reported in hard copy or digital format as determined by NYSDEC. A summary of the monitoring program deliverables are summarized in Table 3 below.

Table 3: Schedule of Monitoring/Inspection Reports

Task	Frequency of Report Preparation*
Site-wide Inspection	Annually
Groundwater Sampling	Semi-annually for two (2) years
Inspection of the SSDS, AS, and SVE Systems	Annually

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC. Following the initial 2 years of monitoring the results will be discussed to the NYSDEC to assess for changes in sampling frequency.

7.0 OPERATION AND MAINTENANCE PLAN

7.1 Introduction

This Operation and Maintenance Plan describes the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the Site. This Operation and Maintenance Plan:

- Includes the steps necessary to allow individuals unfamiliar with the Site to operate and maintain the SSDS, and the AS/SVE systems;
- Includes an operation and maintenance contingency plan; and,
- Will be updated periodically to reflect changes in Site conditions or the manner in which the SSDS and/or AS/SVE systems are operated and maintained.

Information on non-mechanical ECs (i.e. soil cover system) is provided in Section 3 - Engineering and Institutional Control Plan. A copy of this SMP, including this Operation and Maintenance Plan, must be kept at the Site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of the SMP.

7.2 ENGINEERING CONTROL SYSTEM OPERATION AND MAINTENANCE

7.2.1 Sub-slab Depressurization System

Unless it becomes evident that more frequent monitoring is necessary, annual monitoring of the Site's SSDS will be performed to ensure that the system is operating properly. A visual inspection of the complete system will be conducted during each monitoring event. A manometer reading will be obtained during the visual inspection. System labeling will be confirmed to still be present on the vent pipes. SSDS components to be visually inspected include, but are not limited to, the vent fans, manometer, and overall system piping and wiring. In the event that a vent fan appears to be malfunctioning, or if piping and wiring appears damaged, the component(s) in question will be promptly repaired or replaced, following the manufacturer's recommendations and instructions. Vent fan failure, repair, replacement, and/or operational problems will be noted in the

subsequent Periodic Review Report.

7.2.2 Air Sparge/ Soil Vapor Extraction System

Annual monitoring of the AS/SVE systems will be performed to ensure that the system is operating properly. A visual inspection of the aboveground portions of the AS/SVE systems will be conducted during each monitoring event. AS/SVE components to be visually inspected include, but are not limited to, the air compressor, heat exchanger, solenoid valves, flow meters and gauges, and control panel. In the event that any of these components appears to be malfunctioning, or if piping or wiring appears damaged, the component(s) in question will be promptly repair or replaced, following the manufacturer's recommendations and instructions. Any operational problems will be noted in the subsequent Periodic Review Report.

7.3 ENGINEERING CONTROL SYSTEM PERFORMANCE MONITORING

Copies of maintenance reports and any other information generated during regular operations at the Site will be kept on-file at the property owner's place of business and/or the designated qualified environmental professional. All reports, forms, and other relevant information generated will be available upon request to the NYSDEC and submitted as part of the Periodic Review Report, as specified in Section 5 of this SMP.

7.3.1 Monitoring Schedule

Inspection frequency is subject to change with the approval of the NYSDEC. Unscheduled inspections and/or sampling may take place when a suspected failure of either system has been reported or an emergency occurs that is deemed likely to affect the operation of the systems. Monitoring deliverables for the SSDS and AS/SVE systems are specified later in this Plan.

7.3.2 General Equipment Monitoring

If any equipment readings are not within their typical range, any equipment is observed to be malfunctioning, or the system is not performing within specifications, maintenance and repair as per the Operation and Maintenance Plan is required immediately, after which the SSDS or AS/SVE systems is to be promptly restarted.

7.3.3 System Monitoring Devices and Alarms

The SSDS has a warning device to indicate that the system is not operating properly. In the event that the warning device is activated, applicable maintenance and repairs will be conducted, as specified in the Operation and Maintenance Plan, and the SSD system restarted. Operational problems will be noted in the subsequent Periodic Review Report.

7.4 MAINTENANCE AND PERFORMANCE MONITORING REPORTING REQUIREMENTS

Copies of maintenance reports and any other information generated during regular operations at the Site will be kept on-file on-Site. All reports, forms, and other relevant information generated will be available upon request to the NYSDEC and submitted as part of the Periodic Review Report, as specified in the Section 5 of this SMP.

7.4.1 Routine Maintenance Reports

Checklists or forms will be completed during each routine maintenance event. Checklists/forms will include, but not be limited to the following information:

- Date;
- Name, company, and position of person(s) conducting maintenance activities;
- Maintenance activities conducted;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and,
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

7.4.2 Non-Routine Maintenance Reports

During each non-routine maintenance event, a form will be completed which will include, but not be limited to, the following information:

- Date;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Presence of leaks;
- Date of leak repair;
- Other repairs or adjustments made to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and,
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

8.0 INSPECTIONS, REPORTING AND CERTIFICATIONS

8.1 Site Inspections

8.1.1 Inspection Frequency

Inspections will be conducted at the frequency specified in the schedules set forth in Section 3 (Site Monitoring Plan) and Section 4 (Operation and Maintenance Plan) of this SMP; provided that at a minimum, a Site-wide inspection will be conducted annually. Inspections of remedial components will also be conducted when a breakdown of any treatment system component is suspected to have occurred, and whenever a severe condition has taken place, such as an erosion or flooding event that may affect the ECs.

8.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

All inspections and monitoring events will be recorded on the appropriate forms for their respective system which are contained in Appendices J. Additionally, a general Site-wide inspection form will be completed during the Site-wide inspection (see Appendix I). These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including all media sampling data and system maintenance reports, generated for the Site during the reporting period

will be provided in electronic format in the Periodic Review Report.

8.1.3 Evaluation of Records and Reporting

The results of the inspection and Site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- ECs/ICs are in place, are performing properly, and remain effective;
- The Site Monitoring Plan is being implemented;
- Operation and maintenance activities are being conducted properly; and, based on the above items,
- The Site remedy continues to be protective of public health and the environment and is performing as designed in the RAWP and described in the FER.

8.2 CERTIFICATION OF ENGINEERING AND INSTITUTIONAL CONTROLS

After the last inspection of the reporting period, a qualified environmental professional will prepare the following certification:

"For each institutional or engineering control identified for the Site, I certify that all of the following statements are true:

- The inspection of the Site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;
- Each institutional control and/or engineering control employed at this Site is unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any Site management plan for this control;

- Access to the Site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the Site is compliant with the environmental easement;
- The engineering control systems are performing as designed and are effective;
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the Site remedial program; and
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as Owner's Designated Site Representative for the Site."

The signed certification will be included in the Periodic Review Report described below.

8.3 PERIODIC REVIEW REPORT

A Periodic Review Report (PRR) will be submitted to the Department every year, beginning fifteen months after the Release and Covenant Not to Sue is issued by the Department to UNB pursuant to the terms of the VCA. In the event that the Site is subdivided into separate parcels with different ownership, a single PRR will be prepared that addresses the Site described in Appendix B (Metes and Bounds). The PRR will be prepared in accordance with NYSDEC DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also incorporated into the PRR. The PRR will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the Site;
- Results of the required annual Site inspections and severe condition inspections, if any;

- Copies of all applicable inspection forms and other records generated for the Site during the reporting period in electronic format;
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;
- A Site evaluation, which includes the following:
    - The compliance of the remedy with the requirements of the Site-specific RAWP and Decision Document;
    - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
    - Any new conclusions or observations regarding the Residual Contaminants at the Site based on inspections or data generated by the Site Monitoring Plan for the media being monitored;
    - Recommendations regarding any necessary changes to the remedy and/or Site Monitoring Plan; and
    - The overall performance and effectiveness of the remedy.
- A performance summary for all treatment systems at the Site during the calendar year, including information such as:
    - The number of days the system was run for the reporting period;
    - If capable of being estimated or calculated, the contaminant mass removed;
    - A description of breakdowns and/or repairs along with an explanation for any significant downtime;
    - A description of the resolution of performance problems;

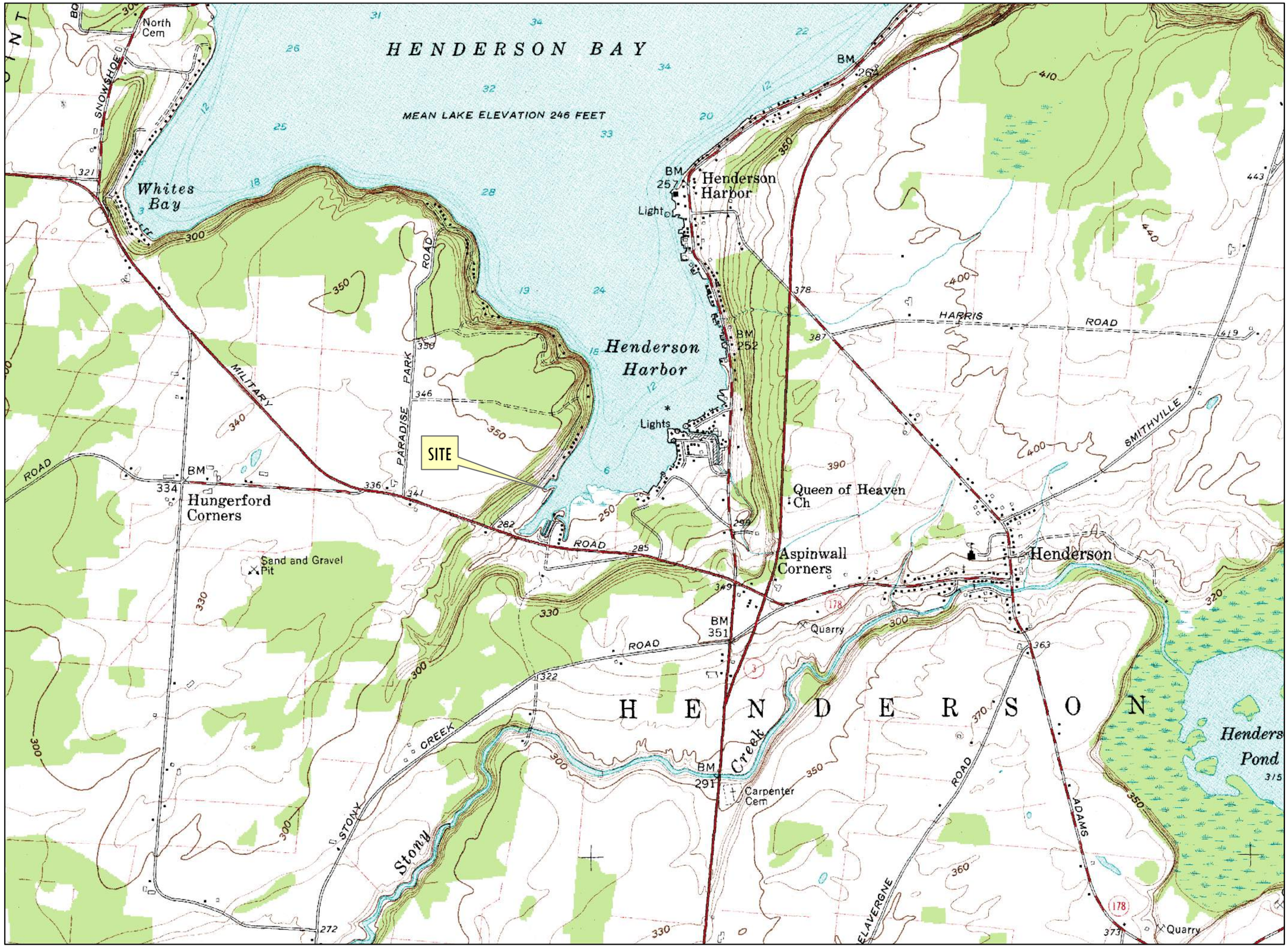
- A summary of the performance, effluent and/or effectiveness monitoring; and
- Comments, conclusions, and recommendations based on data evaluation.

The PRR will be submitted, in hard-copy format, to the NYSDEC Central Office and Regional Office in which the Site is located, and in electronic format to NYSDEC Central Office, Regional Office and the NYSDOH Bureau of Environmental Exposure Investigation.

8.4 CORRECTIVE MEASURES PLAN

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a corrective measures plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the NYSDEC.

FIGURES



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Site Management Plan
NYSDEC VCA Index
No. A4-0463-0602
Lake Ontario Mariners Marina
12548 Eastman Tract
Henderson Harbor, New York

Client:
The Upstate National Bank

Project Location with USGS Topographic Quadrangle

N
W E
S

500 0 1,000

1 inch = 1,500 feet
Intended to print as 11" x 17".

207820

FIGURE 1

Path: J:\Upstate National Bank\207820 Henderson Harbor\Drawings\SMP\Figure 1 Site Location.mxd

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Site Management Plan
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No. A4-0463-0602
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12548 Eastman Tract
Henderson Harbor, New York

Client:
The Upstate National Bank

Site Area Map

N
W E
S

50 0 50
1 inch = 100 feet
Intended to print as 11" x 17".

207820

FIGURE 2

Path: J:\Upstate National Bank\207820 Henderson Harbor\Drawings\SMP\Figure 2 Site boundary.mxd

Legend

- Post-Remedy Monitoring Well Location
- IRM Excavation Confirmation Soil Sample
- Gasoline Pump Removed
- Diesel Pump Removed
- Steel Sheet Piling
- VCA Site Boundary
- Aboveground Tank
- Underground Tank Decommissioned and Removed
- IRM Excavation
- Wood Decking
- Water
- Land

Note: Treatment system locations not depicted.

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Site Management Plan
NYSDEC VCA Index No. A4-0463-0602
Lake Ontario Mariners Marina
12548 Eastman Tract
Henderson Harbor, New York

Client:
The Upstate National Bank

Site Features

N
W E
S

0 5 10 15 20 Feet

1 inch = 15 feet
Intended to print as 11" x 17".

207820

FIGURE 3

Path: J:\Upstate National Bank\207820 Henderson Harbor\Drawings\SMP\Figure 3 Site Features.mxd

Legend

- Post-Remedy Monitoring Well Location
- IRM Excavation Confirmation Soil Sample
- Soil Sample Location with Impacts Above Unrestricted Use SCOs
- Soil Impacts Above Unrestricted Use SCOs
- Interpreted Extent of Groundwater Impacts (12/2014)
- Steel Sheet Piling
- VCA Site Boundary
- IRM Excavation
- Wood Decking
- Water
- Land

Note:
1. Treatment system locations not depicted.
2. Residual Soil Impacts refers to targeted compounds identified at concentrations above Part 375 Unrestricted Use SCOs in confirmatory sample data and site investigation data.
3. RESIDUAL SOIL IMPACTS HAVE NOT BEEN IDENTIFIED ABOVE PART 375 COMMERCIAL USE SCOS.

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Site Management Plan
NYSDEC VCA Index
No. A4-0463-0602
Lake Ontario Mariners Marina
12548 Eastman Tract
Henderson Harbor, New York

Client:
The Upstate National Bank

Remaining Contamination

N
W E
S

0 5 10 15 20 Feet

1 inch = 15 feet
Intended to print as 11" x 17".

207820

FIGURE 4

Path: J:\Upstate National Bank\207820 Henderson Harbor\Drawings\SMP\Figure 4 Remaining Contamination.mxd

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Site Management Plan
NYSDEC VCA Index
No. A4-0463-0602
Lake Ontario Mariners Marina
12548 Eastman Tract
Henderson Harbor, New York

Client:
The Upstate National Bank

Treatment System Features

12548 Eastman Tract
Henderson Harbor, NY

10 0 10
1 inch = 15 feet

207820

FIGURE 5

Y:\Upstate National Bank\207820 Henderson Harbor\Drawings\IRM Report\LOMM Figure3.mxd

APPENDIX A

Excavation Work Plan

APPENDIX A – EXCAVATION WORK PLAN

A-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the Department. Currently, this notification will be made to:

Peter S. Ouderkirk, P.E.

Regional Hazardous Waste Remediation Engineer

317 Washington Street, Watertown, New York

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control,
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work,
- A summary of the applicable components of this EWP,

Simple excavations may only require compliance with a portion of the EWP. For example, excavation of a small volume of soil from above the water table that is directly loaded for off-site disposal would not require the stockpiling or fluids management provisions of this template.

- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120,

- A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in Appendix F of this document,
- Identification of disposal facilities for potential waste streams,
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

A-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based soil screening will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

A-3 STOCKPILE METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC.

A-4 MATERIALS EXCAVATION AND LOAD OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site unless trucks remain on the gravel driveway and parking lot and are free of loose soil and/or debris on the tires and undercarriage when leaving the site. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

A-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the site. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Truck transport routes should take into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

A-6 MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

A-7 MATERIALS REUSE ON-SITE

Chemical criteria for on-site reuse of material have been approved by NYSDEC. The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for re-use on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

A-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, but will be managed off-site.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

A-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the decision document. The demarcation layer, consisting of orange snow fencing material or equivalent material will be replaced to provide a visual reference to the top of the 'Remaining Contamination Zone', the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this Site Management Plan. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the 'Remaining Contamination.' A figure

showing the modified surface will be included in the subsequent Periodic Review Report and in any updates to the Site Management Plan.

A-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are commercial use and protection of groundwater. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

A-11 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

A-12 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 5 of the SMP.

A-13 COMMUNITY AIR MONITORING PLAN

A copy of the Site-specific CAMP for the site is included as Appendix F. The air monitoring station locations will be based on prevailing wind conditions for that day and will be checked throughout the day and adjusted according to the prevailing wind direction. The provisions of the CAMP will be followed during all ground-intrusive activities greater than 2-ft. in depth performed at the Site. Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

A-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site [and on-site, if there are residents or tenants on the property]. Specific odor control methods to be used on a routine basis will include limiting the area of open excavations and size of soil stockpiles and covering soil stockpiles. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the property owner's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

A-15 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved though the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.

- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

A-16 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

APPENDIX B

Metes and Bounds, Site Survey Map & Boundary Change Documentation

HISCOCK & BARCLAY LLP

Thomas J. Warth
Of Counsel

March 12, 2013

VIA U.S. MAIL &
ELECTRONIC MAIL

Kathleen R. Whelehan
President & CEO
The Upstate National Bank
One West Main Street
Rochester, NY 14614

Re: Henderson Harbor Mariners' Marina:
Amended Voluntary Cleanup Agreement

Dear Ms. Whelehan:

We are pleased to advise you that the New York State Department of Environmental Conservation ("NYSDEC") has signed off on a first amendment ("Amendment") to the above referenced voluntary cleanup agreement ("VCA") that reduces from ± 8.402 acres to ± 0.274 acres the site that is subject to the VCA's remedial program requirements.

As Tom Walsh explained in his electronic mail message to you on February 28th, by focusing the remedial program on the area at and near the original sources of contamination, this Amendment should make it easier for the Bank to proceed to the post-cleanup phase of the VCA's remedial program. In that phase, the Bank will commit to a post-cleanup "Site Management Plan" for controlling and monitoring the residual contamination that remains at the site in return for which NYSDEC will issue the Bank a limited assignable Release and Covenant Not to Sue with regard to the contamination that has been addressed under VCA.

Enclosed with the hardcopy of this letter is an original signed copy of the Amendment for the Bank's records.

Please contact Tom Walsh (295-4414) or me if you have any questions or concerns regarding this matter.

Very truly yours,

Thomas J. Warth

Thomas J. Warth

2000 HSBC Plaza – 100 Chestnut Street – Rochester, New York 14604 hblaw.com
twarth@hblaw.com Direct: 585.295.4445 Fax: 585.295.8444

Enclosure
Cc (with enc. via email):
D. Porter, LaBella
G. Mackey, Hiscock & Barclay

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

In the Matter of the
First Amendment to the Voluntary Cleanup Agreement, dated August 16, 2002

for: 12548 Eastman Tract, Town of Henderson, New York

Index No. A4-0463-0602
Site No. V-00585-6

by: **The Upstate National Bank**, Volunteer

WHEREAS, The Upstate National Bank ("Volunteer") and the New York State Department of Environmental Conservation ("Department") entered into a Voluntary Cleanup Agreement for 12548 Eastman Tract, Town of Henderson, New York, Index No. A4-0463-0602 and Site No. V-00585-6 ("Agreement") which was signed on behalf of the Department on August 16, 2002 and became effective on August 26, 2002;

WHEREAS, the Agreement sets forth a process through which the Volunteer proposes, the Department approves, and the Volunteer implements, Work Plans as that term is defined in the Agreement for remedial program activities designed to address in whole or in part the actual and potential presence of Existing Contamination, as that term is defined in the Agreement, at the "Site," as that term is defined in Paragraph I(C) of the Agreement and depicted in a map attached as Exhibit "A" to the Agreement;

WHEREAS, in the Agreement, the Site is described and depicted as consisting of Jefferson County tax parcel map number 105.12-1-14.22, which measures ±8.402 acres or ±365,991 square feet more or less;

WHEREAS, during the implementation of the Agreement, Volunteer's site investigation was focused on the ±0.274 acre peninsula portion of the tax parcel, containing ±11,932 square feet more or less, where petroleum bulk storage tanks were located and a petroleum discharge(s) had been detected, which ±0.274 acre portion is depicted as the "Amended VCA Property" on the plan entitled "Amended Voluntary Cleanup Agreement (VCA) Property," dated September 2012, prepared by LaBella Associates PC, a copy of which is annexed to and incorporated into this First Amendment as Exhibit "A", and which is described by the metes and bounds description annexed to and incorporated into this First Amendment as Exhibit "A-1";

WHEREAS, during the implementation of the Agreement, Volunteer's interim remedial measure and other remedial program activities to address the actual and potential presence of Existing Contamination were also focused on the same ±0.274 acre portion of the tax parcel;

WHEREAS, Paragraph XIV(G) (2) of the Agreement contemplates a process whereby the Agreement may be modified by a writing subscribed by both the Volunteer and the Department; and

WHEREAS, the Department and the Volunteer desire to modify the Agreement through this First Amendment to the Agreement ("First Amendment") to redefine the Site as consisting only of the ±0.274 acre portion of the tax parcel as depicted in Exhibit "A" and described in Exhibit "A-1" to this First Amendment.

NOW THEREFORE, in consideration of the foregoing and of the mutual covenants and representations contained within this First Amendment and within the Agreement, the Department and the Volunteer agree as follows:

1. Except to the limited extent expressly modified by the terms of this First Amendment, all terms and conditions of the Agreement shall remain in full force and effect.

2. Except as otherwise defined herein, the defined terms contained in the Agreement shall apply to this First Amendment.

3. Exhibit "A" to the Agreement shall be modified to consist of the plan which is annexed to and incorporated into this First Amendment as Exhibit "A".

4. A new Exhibit "A-1" shall be added to the Agreement, which consists of the metes and bounds description which is annexed to and incorporated into this First Amendment as Exhibit "A-1".

5. Paragraph I(C) of the Agreement shall be modified to read as follows:

> "Site" means that parcel of real property containing ±0.274 acres, or ±11,932 square feet more or less, that is located in the Town of Henderson and is part of Jefferson County Tax parcel No. 105.1-14.22, which is depicted as the "Amended VCA Property" on a plan by LaBella Associates PC entitled "Amended Voluntary Cleanup Agreement (VCA) Property," dated September 2012, a copy of which is annexed to and incorporated into this Agreement as Exhibit "A", and which is described by the metes and bounds description annexed to and incorporated herein as Exhibit "A-1."

DATED: FEB 28 2013

JOSEPH MARTENS, COMMISSIONER
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

By: Robert Schick, P.E., Director
Division of Environmental Remediation

CONSENT BY VOLUNTEER

Volunteer hereby consents to the issuing and entering of this First Amendment, waives Volunteer's right to a hearing herein as provided by law, and agrees to be bound by this First Amendment.

THE UPSTATE NATIONAL BANK

By: Kathleen R. Whelehan
Title: President
Date: February 25, 2013

STATE OF NEW YORK)
) ss:
COUNTY OF MONROE)

On the 25th day of February, in the year 2013, before me, the undersigned, personally appeared Kathleen R. Whelehan, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Linda Belmont
Signature and Office of individual
taking acknowledgment

LINDA BELMONT
Notary Public
State Of New York
Qualified In Wayne County
Commission Expires Jan. 31, 2014

EXHIBIT "A"

to the

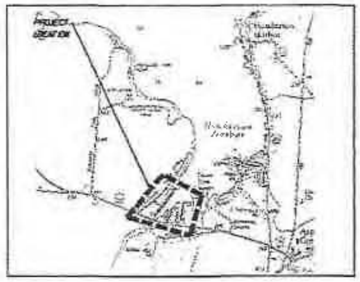
First Amendment to the Voluntary Cleanup Agreement, dated August 16, 2002

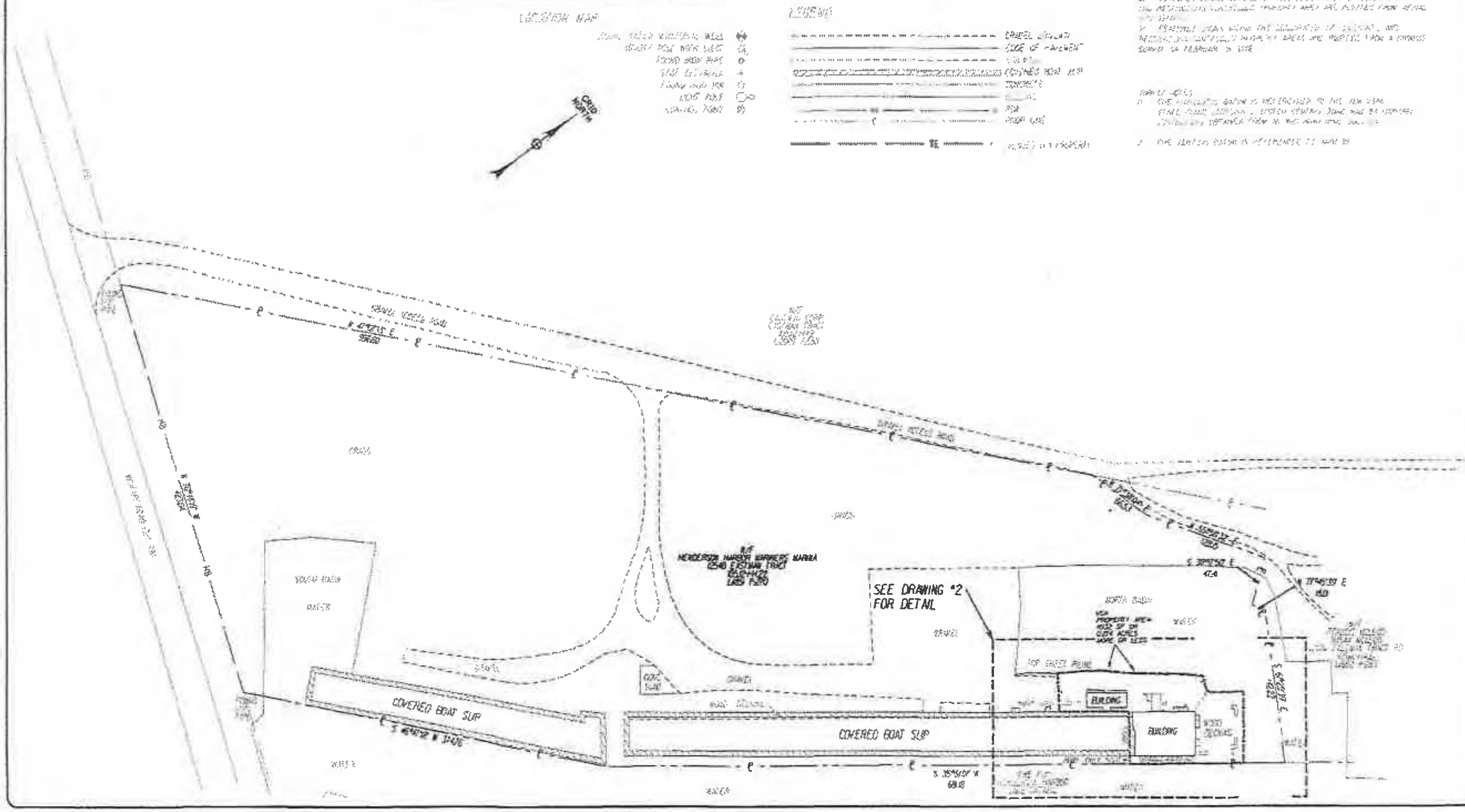
LaBella Associates PC

AMENDED VOLUNTARY CLEANUP AGREEMENT (VCA) PROPERTY

September 2012

THE ENGINEERING AND INDUSTRIAL CONTROLS FOR THIS DECLARATION OF COVENANTS AND RESTRICTIONS ARE SET FORTH IN THE SITE MANAGEMENT PLAN (SMP). A COPY OF THE SMP MUST BE OBTAINED BY ANY PARTY WITH AN INTEREST IN THE PROPERTY. THE SMP CAN BE OBTAINED FROM THE NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DIVISION OF ENVIRONMENTAL REMEDIATION, SITE CONTROL SECTION, 625 BROADWAY, ALBANY, NY 12233, OR AT derweb@gw.dec.state.ny.us.





LABELLA Associates, P.C.
300 STATE STREET
ROCHESTER, NY 14614
P: (585) 454-6110
F: (585) 454-3066

NYSDEC SITE NO. V00585
NYSDEC SPILL SITE NO. 0006174
HENDERSON HARBOR MARINERS MARINA
12548 EASTMAN TRACT
HENDERSON, NY

THE UPSTATE NATIONAL BANK
1 WEST MAIN ST
ROCHESTER, NY 14614

AMENDED VOLUNTARY CLEANUP AGREEMENT (VCA) PROPERTY

SEPTEMBER 2012

207820

1 OF 2

ORIGINAL DESCRIPTION:
LANDS NOW OR FORMERLY OF HENDERSON HARBOR MARINERS' MARINA INC. T.P. 105.12-1-4.22 L. 1051 P. 270 AREA=365591 SF OR 8.402 ACRES TO ROW

SCHEDULE A - DESCRIPTION OF INSURED PREMISES

THE ENGINEERING AND INDUSTRIAL CONTROLS FOR THIS DECLARATION OF COVENANTS AND RESTRICTIONS ARE SET FORTH IN THE SITE MANAGEMENT PLAN (SMP). A COPY OF THE SMP MUST BE OBTAINED BY ANY PARTY WITH AN INTEREST IN THE PROPERTY. THE SMP CAN BE OBTAINED FROM THE NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DIVISION OF ENVIRONMENTAL REMEDIATION, SITE CONTROL SECTION, 625 BROADWAY, ALBANY, NY 12233, OR AT derweb@gw.dec.state.ny.us.

METES AND BOUNDS DESCRIPTION
OF AMENDED VCA PROPERTY SITE No V00585

Beginning at a point in the easterly boundary of lands now or formerly of Henderson Harbor Mariners' Marina Inc., said point being S 35°51'01" W, as measured along said easterly boundary a distance of 41.36 feet from the southerly boundary of lands now or formerly of Francis McLeod and Susan McLeod, said point also being a corner of a sheet pile wall, thence

1) S 35°51'01" W along the face of said sheet pile wall a distance of 114.59 feet to an angle point in said wall; thence

2) N 55°17'42" W continuing along said sheet pile wall a distance of 48.41 feet to a point on the westerly face of an existing wood dock; thence

3) S 35°51'26" W along the westerly face of said wood dock a distance of 70.15 feet to a point; thence

4) N 56°04'41" W through the lands now or formerly of Henderson Harbor Mariners' Marina Inc. a distance of 38.75 feet to a point, said point being the corner of an existing sheet pile wall; thence

Along the face of said existing sheet pile wall the following courses and distances

5) N 37°33'42" E a distance of 6.53 feet to a point; thence

6) N 31°32'31" E a distance of 21.57 feet to a point; thence

7) N 35°02'10" E a distance of 18.23 feet to a point; thence

8) N 41°52'38" E a distance of 22.37 feet to a point; thence

9) N 37°00'58" E a distance of 58.87 feet to a point; thence

10) N 41°38'21" E a distance of 19.62 feet to a point; thence

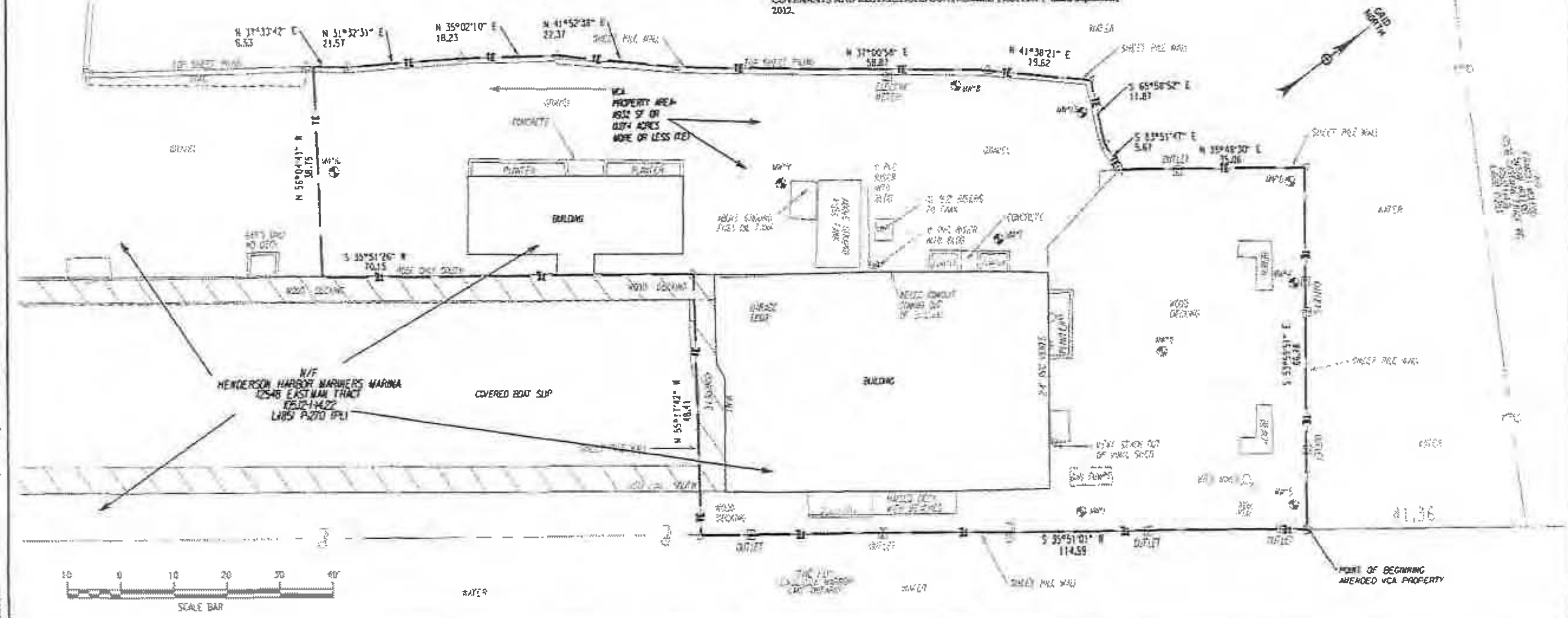
11) S 65°58'52" E a distance of 11.87 feet to a point; thence

12) S 83°51'47" E a distance of 5.67 feet to a point; thence

13) N 35°48'30" E a distance of 35.06 feet to a point; thence

14) S 53°59'51" E a distance of 66.78 feet to the POINT OF BEGINNING.

The above described parcel contains 0.274 acres (11932 sq. ft.) more or less.
All as shown on a plan by LaBella Associates PC filed "DECLARATION OF COVENANTS AND RESTRICTIONS CONTROLLED PROPERTY" dated September, 2012.



AMENDED VOLUNTARY CLEANUP AGREEMENT (VCR) PROPERTY

SEPTEMBER 2012

NYSDEC SITE NO. V00585
NYSDEC SPILL SITE NO. 0006174
HENDERSON HARBOR MARINERS MARINA
12548 EASTMAN TRACT
HENDERSON, NY

THE UPSTATE NATIONAL BANK
1 WEST MAIN ST
ROCHESTER, NY 14614

LABELLA Associates, P.C.
300 STATE STREET
ROCHESTER, NY 14614
P: (585) 454-6110
F: (585) 454-3066

207820

2 OF 2

EXHIBIT "A-1"

to the

First Amendment to the Voluntary Cleanup Agreement, dated August 16, 2002

Metes and Bounds Description of Amended VCA Property

Beginning at a point in the easterly boundary of lands now or formerly of Henderson Harbor Mariners' Marina Inc., said point being S 35°51'01" W, as measured along said easterly boundary a distance of 41.36 feet from the southerly boundary of lands now or formerly of Francis McLeod and Susan McLeod, said point also being a corner of a sheet pile wall; thence

1) S 35°51'01" W along the face of said sheet pile wall a distance of 114.59 feet to an angle point in said wall; thence

2) N 55°17'42" W continuing along said sheet pile wall a distance of 48.41 feet to a point on the westerly face of an existing wood dock; thence

3) S 35°51'26" W along the westerly face of said wood dock a distance of 70.15 feet to a point; thence

4) N 56°04'41" W through the lands now or formerly of Henderson Harbor Mariners' Marina Inc. a distance of 38.75 feet to a point, said point being the corner of an existing sheet pile wall; thence

Along the face of said existing sheet pile wall the following courses and distances

5) N 37°33'42" E a distance of 6.53 feet to a point; thence

6)N 31°32'31" E a distance of 21.57 feet to a point; thence

7)N 35°02'10" E a distance of 18.23 feet to a point; thence

8)N 41°52'38" E a distance of 22.37 feet to a point; thence

9)N 37°00'58" E a distance of 58.87 feet to a point; thence

10)N 41°38'21" E a distance of 19.62 feet to a point; thence

11)S 65°58'52" E a distance of 11.87 feet to a point; thence

12)S 83°51'47" E a distance of 5.67 feet to a point; thence

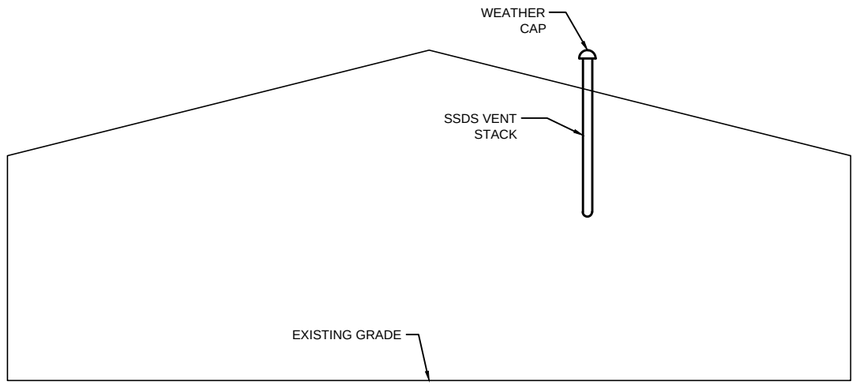
13)N 35°48'30" E a distance of 35.06 feet to a point; thence

14)S 53°59'51" E a distance of 66.78 feet to the POINT OF BEGINNING.

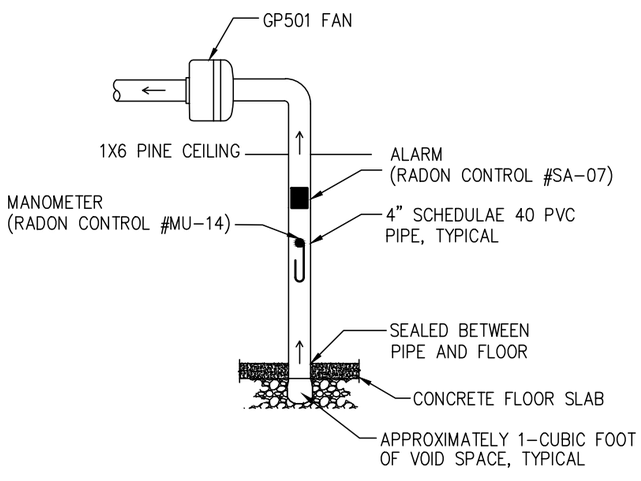
The above described parcel contains 0.274 acres (11932 sq. ft.) more or less.
All as shown on a plan by LaBella Associates PC titled "DECLARATION OF COVENANTS AND RESTRICTIONS CONTROLLED PROPERTY"dated September, 2012.

APPENDIX C

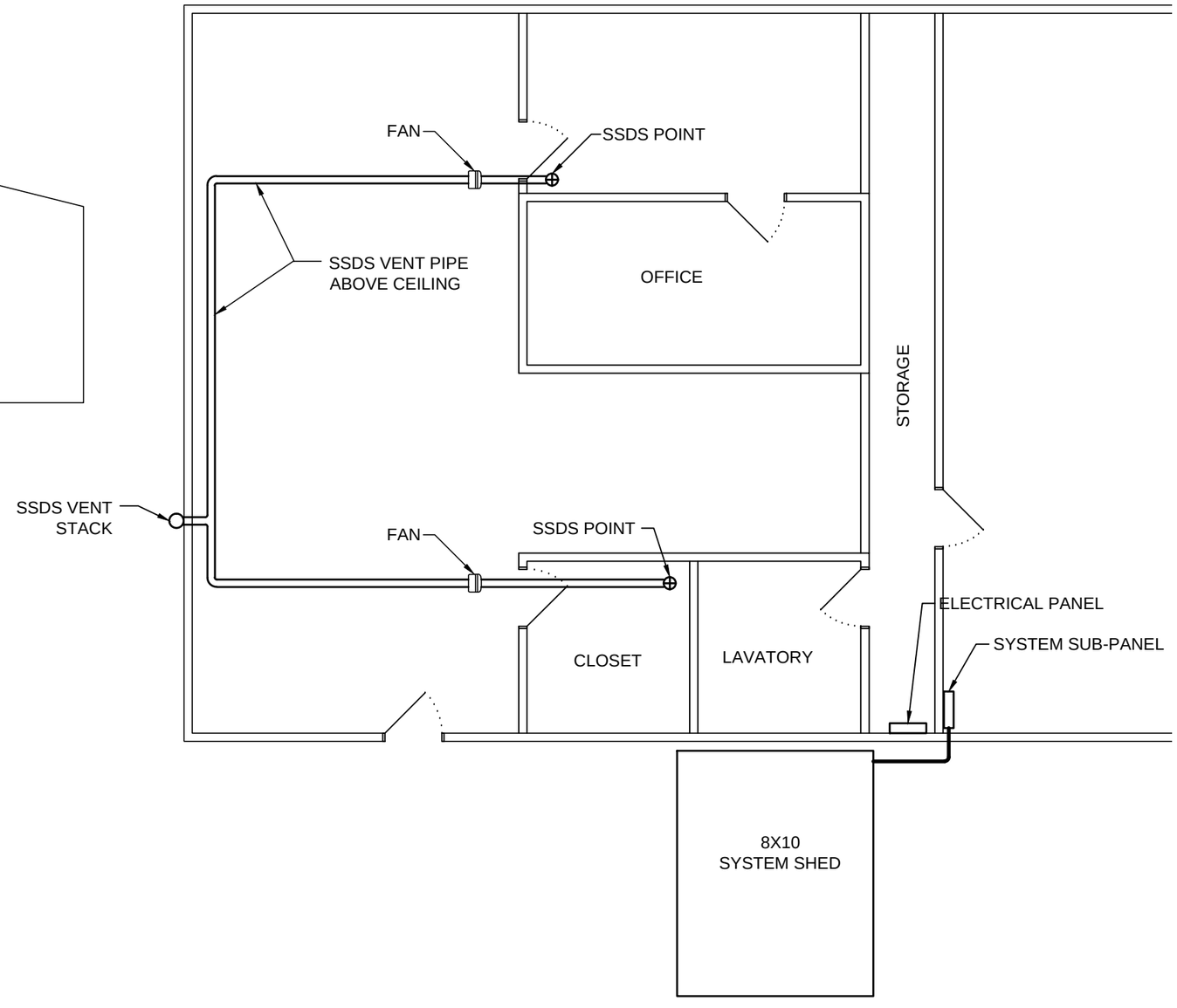
As Built Figures



3 SSDS AS BUILT-NORTH BUILDING ELEVATION
SCALE:NTS



3 SSDS AS BUILT-VENT FAN DETAIL
SCALE:NTS



1 SSDS AS BUILT-PLAN VIEW
SCALE:NTS

N

NOTE:
DRAWING NOT TO SCALE.

LABELLA Associates, D.P.C.
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Architecture
Environmental
Planning
300 STATE STREET
ROCHESTER, NY 14614
P: (585) 454-6110
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www.labellapc.com

PROJECT NO: 207820

REVISION

NO.	DATE	DESCRIPTION
	--	--212000
--		

DRAWN BY: C. JOLLIFF

APPROVED BY: J. HEERKENS

ISSUED FOR: -

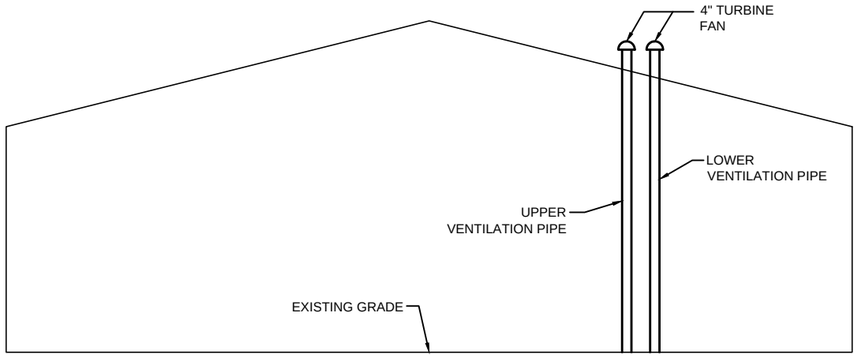
DATE: FEBRUARY 2015

DRAWING NAME:

HENDERSON HARBOR
AS BUILT PLAN

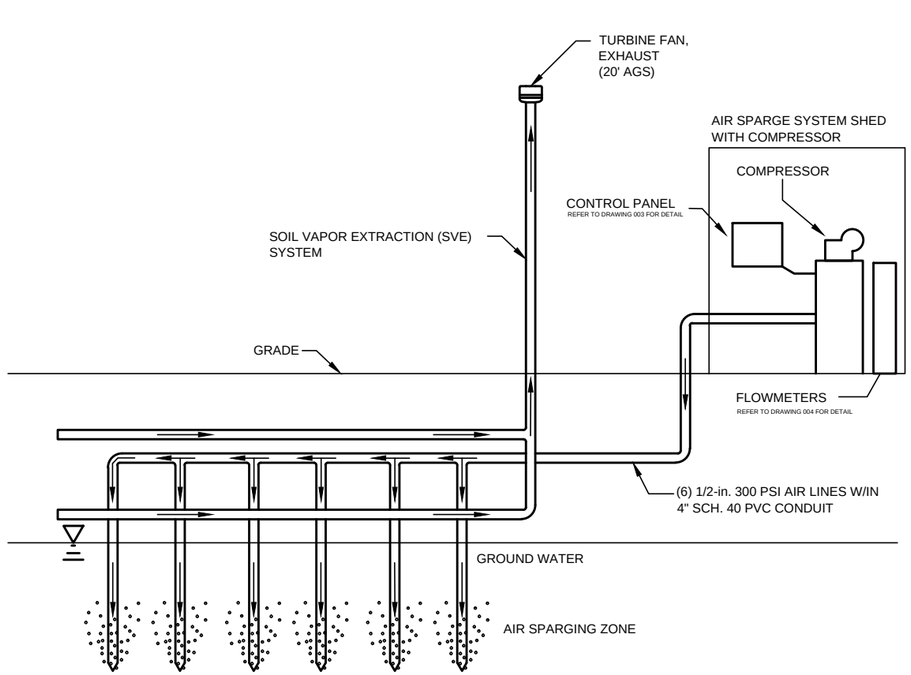
FIGURE NO:

001



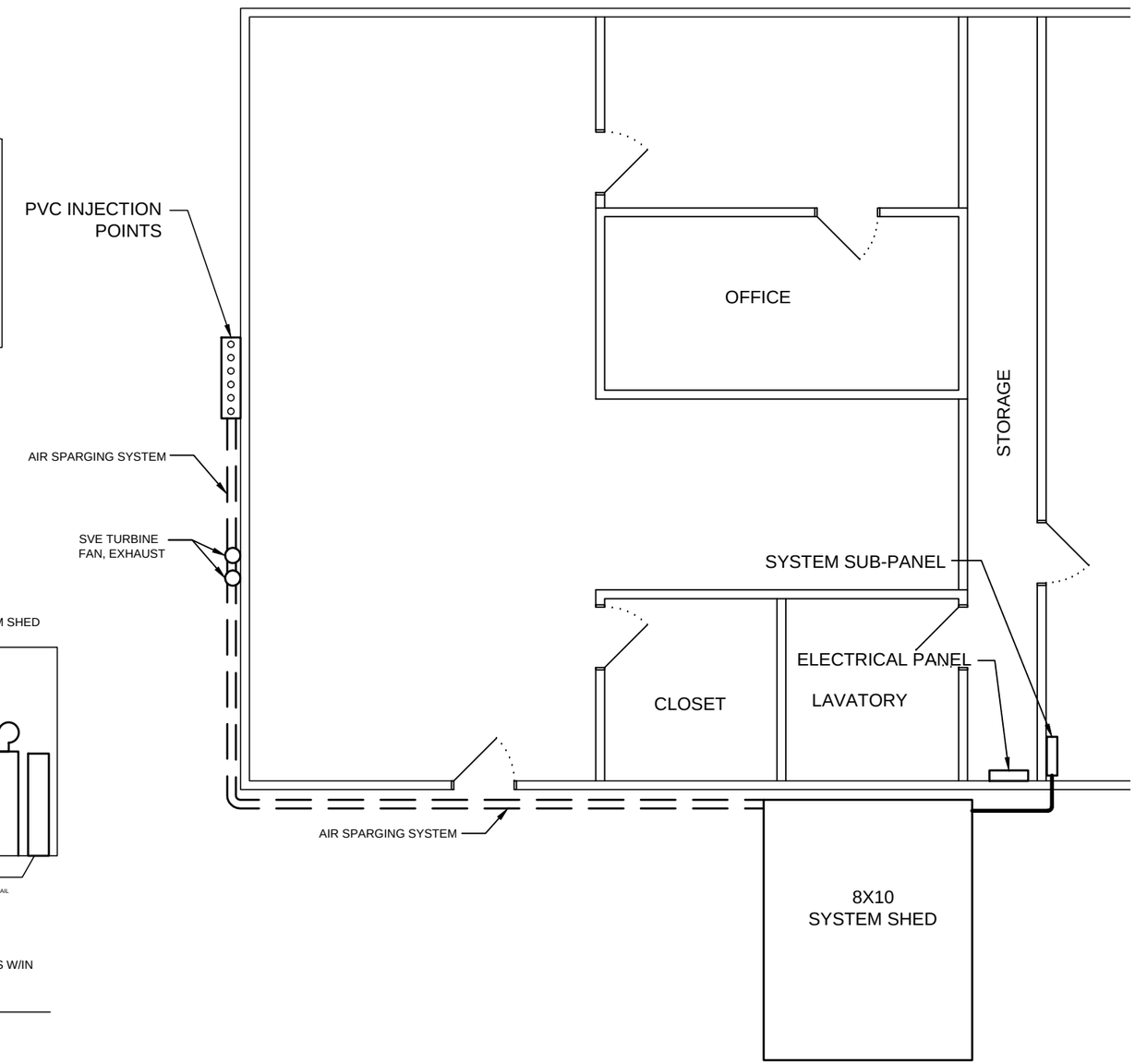
2 SPARGING SYSTEM-NORTH BUILDING ELEVATION

SCALE:NTS



3 SPARGING SYSTEM DETAIL

SCALE:NTS



1 SPARGING SYSTEM-NORTH BUILDING ELEVATION

SCALE:NTS

NOTE:
DRAWING NOT TO SCALE.

LABELLA Associates, D.P.C.

Engineering
Architecture
Environmental
Planning

300 STATE STREET
ROCHESTER, NY 14614
P: (585) 454-6110
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PROJECT NO: 207820

REVISION

NO.	DATE	DESCRIPTION
	--	--212000
--		

DRAWN BY: C. JOLLIFF

APPROVED BY: J. HEERKENS

ISSUED FOR: -

DATE: FEBRUARY 2015

DRAWING NAME:

HENDERSON HARBOR
AS BUILT PLAN

FIGURE NO: 002

APPENDIX D

IRM Report Tables & Figures

LABELLA
LaBella Associates, P.C.
300 State Street
Rochester, New York 14614

Tables

REFERENCE PAGE FOR SAMPLE RESULTS

Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602

Qualifiers

U - The compound was not detected at the indicated concentration.

J - This flag denotes the result was estimated as it was detected below the reporting limit

D - For Organics analysis, this flag indicates the compound concentration was obtained from a diluted analysis.

BTEX - Benzene, Toluene, Ethylbenzene and Xylenes

VOCs - Volatile Organic Compounds

NYSDEC - New York State Department of Environmental Conservation

TOGS 1.1.1 - NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) No. 1.1.1 - *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*

ug/L - micrograms per Liter

NYS - New York State

NA - Not Applicable of Not Available

USEPA - denotes United States Environmental Protection Agency

Table 1 - Well MW-1
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: MW-1

Sample Date	11/10/2009	1/22/2010	10/6/2010	6/28/2011	12/18/2012	9/20/2013	5/7/2014	12/17/2014	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard
Static Water Level (feet)	**4.68**	**NA**	**4.20**	**2.30**	**5.28**	**NA**	**3.11**	**5.02**	
Methyl tert-butyl ether	**5600 D**	**110**	**190 D**	**47**	**1900**	**150**	1.89	**46.5**	**10**
Benzene	**2000 D**	**120**	**95**	**23**	**910**	**88**	**11.2**	**37.3**	**1**
Toluene	**120**	**12**	**5.4**	0.99 J	**55**	3.1	1 U	1.61	**5**
Ethylbenzene	**270 D**	**33**	**20**	4.5 J	**280**	4.7	1.73	**8.93**	**5**
m,p-Xylene	**570 D**	**200**	**33**	**5.4**	**490**	ND	1.17	**13.4**	**5**
o-Xylene	**27**	11	4.9 J	5 U	**18**	ND	1 U	1.17	**5**
Xylene (total)	**597 D**	NL	**38**	**5.4**	**408**	**40**	1.17	**14.6**	**5**
Isopropylbenzene	**11**	**6.9**	3 J	5 U	**20**	4.6	1 U	1.40	**5**
n-Propylbenzene	**9.4**	**8.3**	3.5 J	5 U	**23**	**5.5**	1 U	NA	**5**
1,3,5-Trimethylbenzene	**24**	**22**	**6.6**	5 U	**28**	2.9	1 U	NA	**5**
tert-Butylbenzene	1.0 J	ND	5 U	5 U	5 U	<1.0	1	NA	**5**
1,2,4-Trimethylbenzene	**110**	**140**	**51**	**5.4**	**190**	**26**	1.53	NA	**5**
sec-Butylbenzene	5.0 U	ND	5 U	5 U	0.68 J	<1.0	1 U	NA	**5**
4-Isopropyltoluene	1.0 J	ND	5 U	5 U	5 U	ND	1 U	NA	**5**
n-Butylbenzene	5.0 U	3.6	2.9 J	5 U	5 U	1.7	1 U	NA	**5**
Naphthalene	**430 D**	5	**25**	3.6 **J**	**400**	5	1.56	NA	**10**
Total BTEX	2987	165	158.4	33.89	1653	135.8	14.1	62.44	**NA**
Total VOCs	9173 JD	674.5 J	464 J	95.29 J	4723 J	331.5	21.25	124.9	**NA**

Table 1 - Well MW-4
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: MW-4

Sample Date	1/22/2010	10/6/2010	6/28/2011	12/18/2012	9/20/2013	5/7/2014	12/17/2014	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard
Static Water Level (feet)	**NA**	**4.50**	**2.47**	**4.50**	**NA**	**3.03**	**5.26**	
Methyl tert-butyl ether	**93**	**590 D**	**96**	**780**	7.5	**34.0**	**181**	**10**
Benzene	**58**	**240 D**	**48**	**430**	**87**	**17.5**	**97.8**	**1**
Toluene	2.4 J	**25**	4.2 J	**67**	<1.0	1.13	**10.2**	**5**
Ethylbenzene	**14**	**51**	**13**	**150**	**21**	3.60	**28.2**	**5**
m,p-Xylene	**17**	**130**	**28**	330	ND	4.75	**64.4**	**5**
o-Xylene	ND	**23**	2.6 J	38	ND	1 U	3.79	**5**
Xylene (total)	**17**	**150**	**31**	**370**	<1.0	4.75	**68.19**	**5**
Isopropylbenzene	ND	1.8 J	5 U	**5.9**	1.1	1 U	1.57	**5**
n-Propylbenzene	ND	2 J	5 U	**7.2**	<1.0	1 U	NA	**5**
1,3,5-Trimethylbenzene	ND	4.3 J	5 U	**11**	<1.0	1 U	NA	**5**
tert-Butylbenzene	ND	5 U	5 U	5 U	<1.0	1 U	NA	**5**
1,2,4-Trimethylbenzene	**7**	**24**	3.9 J	**78**	**7.8**	2.19	NA	**5**
sec-Butylbenzene	ND	5 U	5 U	5 U	<1.0	1 U	NA	**5**
4-Isopropyltoluene	ND	5 U	5 U	0.78 J	**97**	1 U	NA	**5**
n-Butylbenzene	ND	5 U	5 U	5 U	<1.0	1 U	NA	**5**
Naphthalene	**16**	**180**	**33**	**300**	**38 J**	**12.2**	NA	**10**
Total BTEX	91.4	466	96.2	1017	108	26.98	204.39	**NA**
Total VOCs	207.4 J	1413	249	2267.88	259.4	46.12	386.96	**NA**

Table 1 - Well MW-5
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: MW-5

Sample Date	1/22/2010	10/6/2010	6/28/2011	12/18/2012	9/20/2013	5/7/2014	12/17/2014	NYSDEC TOGS 1.1.1 Groundwater Standard
Static Water Level (feet)	**NA**	**4.50**	**2.45**	**5.40**	**NA**	**3.20**	**5.25**	
Methyl tert-butyl ether	**120**	**710 D**	**39**	**1100**	**270**	1 U	**92.9**	**10**
Benzene	**38**	**140**	**8.4**	**220**	**84**	**3.51**	**27.3**	**1**
Toluene	ND	3.5 J	5 U	**9.1**	1.6	1 U	1 U	**5**
Ethylbenzene	ND	5 U	5 U	0.97 J	ND<1.0	1 U	2.85	**5**
m,p-Xylene	ND	2.9 J	5 U	16	NA	1 U	**6.57**	**5**
o-Xylene	ND	5 U	5 U	1.1 J	NA	1 U	1 U	**5**
Xylene (total)	NL	2.9 J	5 U	**17**	2.0	1 U	**6.57**	**5**
Isopropylbenzene	ND	5 U	5 U	5 U	NA	1 U	1 U	**5**
n-Propylbenzene	ND	5 U	5 U	5 U	ND<1.0	1 U	NA	**5**
1,3,5-Trimethylbenzene	ND	5 U	5 U	5 U	ND<1.0	1 U	NA	**5**
tert-Butylbenzene	ND	5 U	5 U	5 U	ND<1.0	1 U	NA	**5**
1,2,4-Trimethylbenzene	ND	5 U	5 U	1.4 J	ND<1.0	1 U	NA	**5**
sec-Butylbenzene	ND	5 U	5 U	5 U	ND<1.0	1 U	NA	**5**
4-Isopropyltoluene	ND	5 U	5 U	5 U	ND<1.0	1 U	NA	**5**
n-Butylbenzene	ND	5 U	5 U	5 U	ND<1.0	1 U	NA	**5**
Naphthalene	ND	4.9 J	3.2 J	2.9 J	0.76 J	1 U	NA	**10**
Total BTEX	38	146.4	8.4	247.07	87.6	3.51	36.72	**NA**
Total VOCs	158	864.2	47.4	1368.47 J	358.36	3.51 U	136.19	**NA**

Table 1 - Well MW-6
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: MW-6

Sample Date	1/22/2010	10/6/2010	6/28/2011	12/18/2012	9/20/2013	5/7/2014	12/17/2014	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard
Static Water Level (feet)	**NA**	**4.50**	**2.40**	**5.51**	**NA**	**3.29**	**5.31**	
Methyl tert-butyl ether	**37**	**18**	**11**	**25**	**36**	**26.3**	7.74	**10**
Benzene	ND	5 U	5 U	5 U	<1.0	**2.67**	1 U	**1**
Toluene	ND	5 U	5 U	0.88 J	<1.0	1 U	1 U	**5**
Ethylbenzene	ND	5 U	5 U	5 U	<1.0	1 U	1 U	**5**
m,p-Xylene	ND	5 U	5 U	5 U	ND	1 U	1 U	**5**
o-Xylene	ND	5 U	5 U	5 U	ND	1 U	1 U	**5**
Xylene (total)	NL	5 U	5 U	5 U	<2.0	1 U	1 U	**5**
Isopropylbenzene	ND	5 U	5 U	5 U	<1.0	1 U	1 U	**5**
n-Propylbenzene	ND	5 U	5 U	5 U	<1.0	1 U	NA	**5**
1,3,5-Trimethylbenzene	ND	5 U	5 U	5 U	<1.0	1 U	NA	**5**
tert-Butylbenzene	ND	5 U	5 U	5 U	<1.0	1 U	NA	**5**
1,2,4-Trimethylbenzene	ND	5 U	5 U	5 U	<1.0	1 U	NA	**5**
sec-Butylbenzene	ND	5 U	5 U	5 U	<1.0	1 U	NA	**5**
4-Isopropyltoluene	ND	5 U	5 U	5 U	**97**	1 U	NA	**5**
n-Butylbenzene	ND	5 U	5 U	5 U	<1.0	1 U	NA	**5**
Naphthalene	ND	5 U	5 U	5 U	<1.0	1 U	NA	**10**
Total BTEX	0	0	0	0.88	0	2.67	0	**NA**
Total VOCs	37	18	11	25.88 J	133	28.97 U	7.74	**NA**

Table 1 - Well MW-7
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: MW-7

Sample Date	11/10/2009	10/6/2010	12/18/2012	9/19/2013	5/8/2014	12/17/2014	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard
Static Water Level (feet)	**3.88**	**3.60**	**3.62**	**NA**	**3.04**	**4.20**	
Methyl tert-butyl ether	**310 D**	**190 D**	4.4 J	**27**	1.34	**38.0**	**10**
Benzene	**180**	**96**	5 U	**3.2**	**1.92**	**2.73**	**1**
Toluene	**53**	**9.9**	5 U	<1.0	1 U	1 U	**5**
Ethylbenzene	**370 D**	**270 D**	5 U	1	**5.19**	2.41	**5**
m,p-Xylene	**620 D**	**140**	5 U	ND	1 U	1 U	**5**
o-Xylene	**28**	**7**	5 U	ND	1 U	1 U	**5**
Xylene (total)	**648 D**	**150**	5 U	<2.0	1 U	1 U	**5**
Isopropylbenzene	**46**	**32**	5 U	2.1	3.00	1.74	**5**
n-Propylbenzene	**60**	**42**	5 U	2.7	3.94	NA	**5**
1,3,5-Trimethylbenzene	**92**	4.5 J	5 U	<1.0	1 U	NA	**5**
tert-Butylbenzene	1.3 J	5 U	5 U	<1.0	1 U	NA	**5**
1,2,4-Trimethylbenzene	**470 D**	**190**	5 U	0.77 J	4.68	NA	**5**
sec-Butylbenzene	2.4 J	2.1 J	5 U	<1.0	1 U	NA	**5**
4-Isopropyltoluene	1.3 J	5 U	5 U	ND	1 U	NA	**5**
n-Butylbenzene	**6.2**	3.5 J	5 U	<1.0	1 U	NA	**5**
Naphthalene	**100**	**36**	5 U	<1.0	1 U	NA	**10**
Total BTEX	1251	525.9	0	4.2	7.11	5.14	**NA**
Total VOCs	2340.2	1173	4.4 J	36.77	20.07	44.9	**NA**

Table 1 - Well MW-8
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: MW-8

Sample Date	10/6/2010	9/19/2013	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard
Static Water Level (feet)	**2.80**		
Methyl tert-butyl ether	**84**	**13**	**10**
Benzene	5 U	<1.0	**1**
Toluene	5 U	<1.0	**5**
Ethylbenzene	5 U	<1.0	**5**
m,p-Xylene	5 U	ND	**5**
o-Xylene	5 U	ND	**5**
Xylene (total)	5 U	<2.0	**5**
Isopropylbenzene	5 U	<1.0	**5**
n-Propylbenzene	5 U	<1.0	**5**
1,3,5-Trimethylbenzene	5 U	<1.0	**5**
tert-Butylbenzene	5 U	ND	**5**
1,2,4-Trimethylbenzene	5 U	<1.0	**5**
sec-Butylbenzene	5 U	ND	**5**
4-Isopropyltoluene	5 U	**99**	**5**
n-Butylbenzene	5 U	<1.0	**5**
Naphthalene	5 U	0.6 J	**10**
Total BTEX	0	0	**NA**
Total VOCs	84	113	**NA**

Table 1 - Well MW-9
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: MW-9

Sample Date	11/10/2009	1/22/2010	10/6/2010	12/18/2012	9/19/2013	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard
Static Water Level (feet)	**4.40**	**NA**	**3.80**	**3.52**	**NA**	
Methyl tert-butyl ether	**110**	**55** J	4.4 J	0.52 J	**40**	**10**
Benzene	ND	ND	5 U	5 U	<1.0	**1**
Toluene	ND	ND	5 U	5 U	<1.0	**5**
Ethylbenzene	ND	ND	5 U	5 U	<1.0	**5**
m,p-Xylene	ND	1.6 J	5 U	5 U	<1.0	**5**
o-Xylene	ND	ND	5 U	5 U	<1.0	**5**
Xylene (total)	ND	1.6	5 U	5 U	<1.0	**5**
Isopropylbenzene	ND	ND	5 U	5 U	<1.0	**5**
n-Propylbenzene	ND	ND	5 U	5 U	<1.0	**5**
1,3,5-Trimethylbenzene	ND	ND	5 U	5 U	<1.0	**5**
tert-Butylbenzene	ND	ND	5 U	5 U	<1.0	**5**
1,2,4-Trimethylbenzene	ND	1 J	5 U	5 U	<1.0	**5**
sec-Butylbenzene	ND	ND	5 U	5 U	<1.0	**5**
4-Isopropyltoluene	ND	ND	5 U	5 U	<1.0	**5**
n-Butylbenzene	ND	ND	5 U	5 U	<1.0	**5**
Naphthalene	ND	ND	5 U	5 U	<2.0	**10**
Total BTEX	0	1.6	0	0	0	**NA**
Total VOCs	110	57.6 J	4.4	0.52 J	40	**NA**

Table 1 - Well MW-10
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: MW-10

Sample Date	11/10/2009	1/22/2010	10/6/2010	6/28/2011	12/18/2012	9/20/2013	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard
Static Water Level (feet)	**4.38**	**NA**	**3.80**	**2.57**	**4.30**	**NA**	
Methyl tert-butyl ether	5 U	ND	ND	5 U	5 U	<1.0	**10**
Benzene	5 U	ND	ND	5 U	5 U	**84**	**1**
Toluene	5 U	ND	ND	5 U	5 U	1.6	**5**
Ethylbenzene	5 U	ND	ND	5 U	5 U	<1.0	**5**
m,p-Xylene	5 U	ND	ND	5 U	5 U	ND	**5**
o-Xylene	5 U	ND	ND	5 U	5 U	ND	**5**
Xylene (total)	5 U	NL	ND	5 U	5 U	2	**5**
Isopropylbenzene	5 U	ND	ND	5 U	5 U	<1.0	**5**
n-Propylbenzene	5 U	ND	ND	5 U	5 U	<1.0	**5**
1,3,5-Trimethylbenzene	5 U	ND	ND	5 U	5 U	<1.0	**5**
tert-Butylbenzene	5 U	ND	ND	5 U	5 U	<1.0	**5**
1,2,4-Trimethylbenzene	5 U	ND	ND	5 U	5 U	<1.0	**5**
sec-Butylbenzene	5 U	ND	ND	5 U	5 U	<1.0	**5**
4-Isopropyltoluene	5 U	ND	ND	5 U	5 U	ND	**5**
n-Butylbenzene	5 U	ND	ND	5 U	5 U	ND	**5**
Naphthalene	5 U	ND	ND	5 U	5 U	0.76	**10**
Total BTEX	0	0	0	0	0	87.6	**NA**
Total VOCs	0	0	0	0	0	88.4	**NA**

Table 1 - Well MW-11
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: MW-11

Sample Date	1/22/2010	10/6/2010	6/28/2011	12/18/2012	9/20/2013	5/7/2014	12/17/2014	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard
Static Water Level (feet)	**NA**	**3.00**	**2.20**	**5.28**	**NA**	**2.80**	**3.38**	
Methyl tert-butyl ether	**91**	**31**	9.8	4.5 J	3.3	4.0	1 U	**10**
Benzene	**19**	**7.9**	**3.8**	5 U	0.86	0.7 U	1 U	**1**
Toluene	**26**	1 J	5 U	5 U	<1.0	1 U	1 U	**5**
Ethylbenzene	**46**	**14**	**5.7**	5 U	**5.3**	1 U	1.56	**5**
m,p-Xylene	**270**	**23**	5 U	5 U	ND	1 U	3.17	**5**
o-Xylene	**150**	5 U	5 U	5 U	ND	1 U	1 U	**5**
Xylene (total)	420	**23**	5 U	5 U	1.7 J	1 U	3.17	**5**
Isopropylbenzene	**5.3**	2.2 J	5 U	5 U	<1.0	1 U	1 U	**5**
n-Propylbenzene	**8.9**	**5** J	5 U	5 U	<2.0	1 U	NA	**5**
1,3,5-Trimethylbenzene	**29**	2.9 J	5 U	5 U	<2.0	1 U	NA	**5**
tert-Butylbenzene	ND	5 U	5 U	5 U	<2.0	1 U	NA	**5**
1,2,4-Trimethylbenzene	**98**	**51**	1.5 J	5 U	<1.0	1 U	NA	**5**
sec-Butylbenzene	ND	1.1 J	5 U	5 U	<1.0	1 U	NA	**5**
4-Isopropyltoluene	ND	5 U	5 U	5 U	ND	1 U	NA	**5**
n-Butylbenzene	3.4 J	4.1 J	5 U	5 U	<1.0	1 U	NA	**5**
Naphthalene	**14**	**11**	5 U	5 U	<1.0	1 U	NA	**10**
Total BTEX	511	45.9	9.5	0	7.86	0	4.73	**NA**
Total VOCs	763.6 J	177.2	19.3	4.5 J	11.16	4.0	7.9	**NA**

Table 1 - Well MW-12
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: MW-12

Sample Date	10/6/2010	6/28/2011	12/18/2012	9/19/2013	5/8/2014	12/17/2014	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard
Static Water Level (feet)	**3.90**	**2.10**	**3.40**	**NA**	**2.79**	**3.63**	
Methyl tert-butyl ether	**39**	**43**	**73**	**51**	10 U	20 U	**10**
Benzene	**120**	**120**	**110**	**130**	**97.9**	**90.7**	**1**
Toluene	**130**	**80**	**55**	**51**	**38.4**	**37**	**5**
Ethylbenzene	**1500 D**	**1400 D**	**770**	**730**	**679**	**683**	**5**
m,p-Xylene	**8200** D	**4900** D	**2800**	NA	**1800**	**1380**	**5**
o-Xylene	**160**	**130**	**63**	NA	**126**	**83**	**5**
Xylene (total)	**8300 D**	**5000 D**	**2863**	**520**	**1926**	**1463**	**5**
Isopropylbenzene	**110**	**130**	**40**	**70**	**87.2**	**69.6**	**5**
n-Propylbenzene	**170**	**200**	**54**	**93**	**139**	NA	**5**
1,3,5-Trimethylbenzene	**660 D**	**660 D**	**380**	**240**	**318**	NA	**5**
tert-Butylbenzene	5 U	5 U	5 U	<1.0	ND U	NA	**5**
1,2,4-Trimethylbenzene	**2400 D**	**2500 D**	**2000**	<1.0	**1620**	NA	**5**
sec-Butylbenzene	**9.5**	**9.3**	5 U	<1.0	**11.4**	NA	**5**
4-Isopropyltoluene	5 U	5 U	5 U	**98**	**15.5**	NA	**5**
n-Butylbenzene	**39**	**49**	**27**	**16**	10 U	NA	**5**
Naphthalene	**360 D**	**380 D**	**380**	**390** B	**317**	NA	**10**
Total BTEX	10050	6600	3798	1431	2741.3	2273.7	**NA**
Total VOCs	22197.5	15601.3	6752	2389	7175.4	3733.70	**NA**

Table 1 - Well MW-13
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: MW-13

Sample Date	10/6/2010	6/28/2011	12/18/2012	9/20/2013	5/8/2014	12/16/2014	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard
Static Water Level (feet)	**4.00**	**2.08**	**4.98**	**NA**	**2.72**	**4.74**	
Methyl tert-butyl ether	**84**	**71**	**140**	**41**	**31.2**	**36.9**	**10**
Benzene	1.8 J	5 U	5 U	<2.0	0.7 U	1 U	**1**
Toluene	1.1 J	5 U	5 U	<2.0	1 U	1 U	**5**
Ethylbenzene	5 U	5 U	5 U	<2.0	1 U	1 U	**5**
m,p-Xylene	4.5 J	2.1 J	5 U	ND	1 U	1 U	**5**
o-Xylene	2.2 J	5 U	5 U	ND	1 U	1.15	**5**
Xylene (total)	**6.7**	2.1 J	5 U	3.5 J	1 U	1.15	**5**
Isopropylbenzene	1.3 J	2.8 J	0.86 J	4.3	4.47	4.24	**5**
n-Propylbenzene	5 U	5 U	5 U	<2.0	1.14	NA	**5**
1,3,5-Trimethylbenzene	5 U	5 U	5 U	<2.0	1 U	NA	**5**
tert-Butylbenzene	5 U	5 U	5 U	<2.0	1 U	NA	**5**
1,2,4-Trimethylbenzene	1.9 J	5 U	5 U	<2.0	1 U	NA	**5**
sec-Butylbenzene	5 U	5 U	5 U	<2.0	1 U	NA	**5**
4-Isopropyltoluene	5 U	5 U	5 U	ND	1 U	NA	**5**
n-Butylbenzene	5 U	5 U	5 U	<2.0	1 U	NA	**5**
Naphthalene	5 U	5 U	5 U	<2.0	1 U	NA	**10**
Total BTEX	9.6	2.1	0	3.5	0.7	1.15	**NA**
Total VOCs	103.5	71	140.86 J	48.8	36.81	43.44	**NA**

Table 1 - Well T1
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: T1

Sample Date	1/22/2010	10/6/2010	6/28/2011	12/18/2012	9/19/2013	5/8/2014	12/17/2014	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard
Static Water Level (feet)	**NA**	**3.90**	**2.15**	**4.18**	**NA**	**2.84**	**4.06**	
Methyl tert-butyl ether	**32**	**66**	8	**33**	**26**	1 U	**83.3**	**10**
Benzene	ND	5 U	5 U	5 U	<1.0 U	0.7 U	1 U	**1**
Toluene	ND	5 U	5 U	5 U	<1.0 U	1 U	1 U	**5**
Ethylbenzene	ND	5 U	5 U	5 U	<1.0 U	1 U	**10.2**	**5**
m,p-Xylene	ND	5 U	5 U	5 U	<1.0 U	1 U	**20.3**	**5**
o-Xylene	ND	5 U	5 U	5 U	<1.0 U	1 U	1.15	**5**
Xylene (total)	NL	5 U	5 U	5 U	<1.0 U	1 U	**21.4**	**5**
Isopropylbenzene	ND	5 U	5 U	5 U	<1.0 U	1 U	1.03	**5**
n-Propylbenzene	ND	5 U	5 U	5 U	<1.0 U	1 U	NA	**5**
1,3,5-Trimethylbenzene	ND	5 U	5 U	5 U	<1.0 U	1 U	NA	**5**
tert-Butylbenzene	ND	5 U	5 U	5 U	<1.0 U	1 U	NA	**5**
1,2,4-Trimethylbenzene	ND	5 U	5 U	5 U	<1.0 U	1 U	NA	**5**
sec-Butylbenzene	ND	5 U	5 U	5 U	<1.0 U	1 U	NA	**5**
4-Isopropyltoluene	ND	5 U	5 U	5 U	<1.0 U	1 U	NA	**5**
n-Butylbenzene	ND	5 U	5 U	5 U	<1.0 U	1 U	NA	**5**
Naphthalene	ND	5 U	5 U	5 U	<1.0 U	1 U	NA	**10**
Total BTEX	0	0	0	0	0	0	31.6	**NA**
Total VOCs	32	66	8	33	26	0	137.38	**NA**

Table 1 - Well T2
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: T2

Sample Date	1/22/2010	10/6/2010	6/28/2011	12/18/2012	9/19/2013	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard
Static Water Level (feet)	**NA**	**3.80**	**2.30**	**3.99**	**NA**	
Methyl tert-butyl ether	**260**	**340**	**110 D**	**24**	**26**	**10**
Benzene	ND	5 U	0.86 J	0.50 J	<1.0 U	**1**
Toluene	ND	5 U	5 U	5 U	<1.0 U	**5**
Ethylbenzene	ND	5 U	5 U	5 U	<1.0 U	**5**
m,p-Xylene	ND	5 U	5 U	5 U	<1.0 U	**5**
o-Xylene	ND	5 U	5 U	5 U	<1.0 U	**5**
Xylene (total)	ND	5 U	5 U	5 U	<1.0 U	**5**
Isopropylbenzene	ND	5 U	5 U	5 U	<1.0 U	**5**
n-Propylbenzene	ND	5 U	5 U	5 U	<1.0 U	**5**
1,3,5-Trimethylbenzene	ND	5 U	5 U	5 U	<1.0 U	**5**
tert-Butylbenzene	ND	5 U	5 U	5 U	<1.0 U	**5**
1,2,4-Trimethylbenzene	ND	5 U	5 U	5 U	<1.0 U	**5**
sec-Butylbenzene	ND	5 U	5 U	5 U	<1.0 U	**5**
4-Isopropyltoluene	ND	5 U	5 U	5 U	<1.0 U	**5**
n-Butylbenzene	ND	5 U	5 U	5 U	<1.0 U	**5**
Naphthalene	ND	5 U	5 U	5 U	<1.0 U	**10**
Total BTEX	0	0	0.86	0.50	0	**NA**
Total VOCs	260	340	110	24.5 J	26	**NA**

Table 1 - Well T3
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: T3

Sample Date	1/22/2010	10/6/2010	12/18/2012	9/19/201	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard
Static Water Level (feet)	**NA**	**3.70**	**4.05**	**NA**	
Methyl tert-butyl ether	**290**	**410**	**390**	**200**	**10**
Benzene	ND	5 U	5 U	<1.0 U	**1**
Toluene	ND	5 U	5 U	<1.0 U	**5**
Ethylbenzene	ND	5 U	5 U	<1.0 U	**5**
m,p-Xylene	ND	5 U	5 U	<1.0 U	**5**
o-Xylene	ND	5 U	5 U	<1.0 U	**5**
Xylene (total)	ND	5 U	5 U	<1.0 U	**5**
Isopropylbenzene	ND	5 U	5 U	<1.0 U	**5**
n-Propylbenzene	ND	5 U	5 U	<1.0 U	**5**
1,3,5-Trimethylbenzene	ND	5 U	5 U	<1.0 U	**5**
tert-Butylbenzene	ND	5 U	5 U	<1.0 U	**5**
1,2,4-Trimethylbenzene	ND	5 U	5 U	<1.0 U	**5**
sec-Butylbenzene	ND	5 U	5 U	<1.0 U	**5**
4-Isopropyltoluene	ND	5 U	5 U	<1.0 U	**5**
n-Butylbenzene	ND	5 U	5 U	<1.0 U	**5**
Naphthalene	ND	5 U	5 U	<1.0 U	**10**
Total BTEX	0	0	0	0	**NA**
Total VOCs	290	410	390	200	**NA**

Table 1 - Well T4
Groundwater Sample Results for Petroleum-Related Volatile Organic Compounds
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
NYSDEC VCA Index #A4-0463-0602
Results Expressed in micrograms per Liter (ug/L)

WELL ID: T4

Sample Date	1/22/2010	10/6/2010	6/28/2011	12/18/2012	9/19/2013	5/8/2014	12/17/2014	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard
Static Water Level (feet)	**NA**	**3.80**	**2.57**	**3.88**	**NA**	**2.89**	**3.98**	
Methyl tert-butyl ether	**610**	**1500** D	**670** D	**540**	**270**	**37.2**	**358**	**10**
Benzene	**33**	**120**	**120**	**20**	**94**	**190**	**116**	**1**
Toluene	2 J	4.5 J	**9.6**	2 J	**6.4**	**11.8**	**7.81**	**5**
Ethylbenzene	**16**	**13**	**50**	**5.7**	**23**	**109**	**52.3**	**5**
m,p-Xylene	4.1 J	8	**12**	5.7	ND	**12.1**	5 U	**5**
o-Xylene	ND	1.7 J	2.3 J	1.2 J	**7.6**	10 U	5 U	**5**
Xylene (total)	NL	**9.7**	**15**	**6.8**	**7.6**	**12.1**	5 U	**5**
Isopropylbenzene	4.3 J	**8**	**11**	0.93 J	**9.6**	**16.8**	**6.07**	**5**
n-Propylbenzene	2.7 J	4.9 J	**5.5**	5 U	4.2	**11**	NA	**5**
1,3,5-Trimethylbenzene	ND	1.2 J	3 J	0.97 J	2.4	10 U	NA	**5**
tert-Butylbenzene	ND	5 U	5 U	5 U	<1.0	10 U	NA	**5**
1,2,4-Trimethylbenzene	ND	2.4 J	3.2 J	1.4 J	2.7	10 U	NA	**5**
sec-Butylbenzene	ND	2.2 J	0.87 J	5 U	<1.0	10 U	NA	**5**
4-Isopropyltoluene	ND	5 U	5 U	5 U	<1.0	10 U	NA	**5**
n-Butylbenzene	ND	5 U	5 U	5 U	<1.0	10 U	NA	**5**
Naphthalene	ND	1.7 J	1.7 J	6.3	1.6	10 U	NA	**10**
Total BTEX	51	147.2	194.6	34.5	131	322.9	181.11	**NA**
Total VOCs	672.1 J	1677.3	893.1	584.1 J	429.1	400	540.18	**NA**

TABLE 1
Remedial Measure Groundwater Sample Results
Preliminary RI Data Package - NYSDEC VCA Index #A4-0463-0602
Lake Ontario Mariners Marina, 12548 Eastman Tract, Henderson Harbor, New York
All Results Expressed in micrograms per Liter (µg/L)

Sample ID	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Groundwater Standard	MW-1	MW-1	MW-1	MW-1	MW-4	MW-4	MW-4	MW-5	MW-5	MW-5	MW-6	MW-6	MW-6	MW-7	MW-7	MW-7	MW-8	MW-9	MW-9	MW-9	MW-9	MW-10	MW-10	MW-10	MW-10	MW-11	MW-11	MW-11	MW-12	MW-12	MW-13	MW-13	T-1	T-1	T-1	T-2	T-2	T-2	T-3	T-3	T-4	T-4	T-4
Sample Date		11/10/2009	1/22/2010	10/6/2010	6/28/2011	1/22/2010	10/6/2010	6/28/2011	1/22/2010	10/6/2010	6/28/2011	1/22/2010	10/6/2010	6/28/2011	11/10/2009	10/6/2010	6/28/2011	10/6/2010	11/10/2009	1/22/2010	10/6/2010	6/28/2011	11/10/2009	1/22/2010	10/6/2010	6/28/2011	1/22/2010	10/6/2010	6/28/2011	10/6/2010	6/28/2011	10/6/2010	6/28/2011	1/22/2010	10/6/2010	6/28/2011	1/22/2010	10/6/2010	6/28/2011	1/22/2010	10/6/2010	6/28/2011
Static Water Level (feet)		4.68		4.20	2.30		4.50	2.47		4.50	2.45		4.50	2.40	3.88	3.60	2.32	2.80	4.40		3.80	2.95	4.38		3.80	2.57		3.00	2.20	3.90	2.10	4.00	2.08		3.90	2.15		3.80	2.30		3.70		3.80	2.57
NYSDEC Spill Technology and Remediation Series List Volatile Organic Compounds																																												
Methyl tert-butyl ether	**10**	**5600 D**	**110**	**190 D**	**47**	**93**	**590 D**	**96**	**120**	**710 D**	**39**	**37**	**18**	**11**	**310 D**	**190 D**	**150**	84	**110**	**55** J	4.4 J	10	5 U	ND	ND	5 U	**91**	**31**	9.8	**39**	**43**	**84**	**71**	**32**	**66**	8	**260**	**340**	**110 D**	**290**	**410**	**610**	**1500** D	**670 D**
Benzene	**1**	**2000 D**	**120**	**95**	**23**	**58**	**240 D**	**48**	**38**	**140**	**8.4**	ND	5 U	5 U	**180**	**96**	**86**	5 U	ND	ND	5 U	5 U	5 U	ND	ND	5 U	**19**	**7.9**	**3.8**	**120**	**120**	1.8 J	5 U	ND	5 U	5 U	ND	5 U	0.86 J	ND	5 U	**33**	**120**	**120**
Toluene	**5**	**120**	**12**	**5.4**	0.99 J	2.4 J	**25**	4.2 J	ND	3.5 J	5 U	ND	5 U	5 U	**53**	**9.9**	**9.2**	5 U	ND	ND	5 U	5 U	5 U	ND	ND	5 U	**26**	1 J	5 U	**130**	**80**	1.1 J	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	2 J	4.5 J	**9.6**
Ethylbenzene	**5**	**270 D**	**33**	**20**	4.5 J	**14**	**51**	**13**	ND	5 U	5 U	ND	5 U	5 U	**370 D**	**270 D**	**390 D**	5 U	ND	ND	5 U	5 U	5 U	ND	ND	5 U	**46**	**14**	**5.7**	**1500 D**	**1400 D**	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	**16**	**13**	**50**
m,p-Xylene	**5**	**570 D**	**200**	**33**	**5.4**	**17**	**130**	**28**	ND	2.9 J	5 U	ND	5 U	5 U	**620 D**	**140**	**330**	5 U	ND	1.6 J	5 U	5 U	5 U	ND	ND	5 U	**270**	**23**	5 U	**8200 D**	**4900 D**	4.5 J	2.1 J	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	4.1 J	8	**12**
o-Xylene	**5**	**27**	11	4.9 J	5 U	ND	**23**	2.6 J	ND	5 U	5 U	ND	5 U	5 U	**28**	**7**	**9.6**	5 U	ND	ND	5 U	5 U	5 U	ND	ND	5 U	**150**	5 U	5 U	**160**	**130**	2.2 J	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	ND	1.7 J	2.3 J
Xylene (total)	**5**	**597 D**	NL	**38**	**5.4**	NL	**150**	**31**	NL	2.9 J	5 U	NL	5 U	5 U	**648 D**	**150**	**340**	5 U	ND	NL	5 U	5 U	5 U	NL	ND	5 U	NL	**23**	5 U	**8300 D**	**5000 D**	**6.7**	2.1 J	NL	5 U	5 U	ND	5 U	5 U	ND	5 U	NL	**9.7**	**15**
Isopropylbenzene	**5**	**11**	**6.9**	3 J	5 U	ND	1.8 J	5 U	ND	5 U	5 U	ND	5 U	5 U	**46**	**32**	**69**	5 U	ND	ND	5 U	5 U	5 U	ND	ND	5 U	**5.3**	2.2 J	5 U	**110**	**130**	1.3 J	2.8 J	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	4.3 J	**8**	**11**
n-Propylbenzene	**5**	**9.4**	**8.3**	3.5 J	5 U	ND	2 J	5 U	ND	5 U	5 U	ND	5 U	5 U	**60**	**42**	**110**	5 U	ND	ND	5 U	5 U	5 U	ND	ND	5 U	**8.9**	**5** J	5 U	**170**	**200**	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	2.7 J	4.9 J	**5.5**
1,3,5-Trimethylbenzene	**5**	**24**	**22**	**6.6**	5 U	ND	4.3 J	5 U	ND	5 U	5 U	ND	5 U	5 U	**92**	4.5 J	5 U	5 U	ND	ND	5 U	5 U	5 U	ND	ND	5 U	**29**	2.9 J	5 U	**660 D**	**660 D**	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	ND	1.2 J	3 J
tert-Butylbenzene	**5**	1.0 J	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	1.3 J	5 U	5 U	5 U	ND	ND	5 U	5 U	5 U	ND	ND	5 U	ND	5 U	5 U	5 U	5 U	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	ND	5 U	5 U
1,2,4-Trimethylbenzene	**5**	**110**	**140**	**51**	**5.4**	**7**	**24**	3.9 J	ND	5 U	5 U	ND	5 U	5 U	**470 D**	**190**	**610 D**	5 U	ND	1 J	5 U	5 U	5 U	ND	ND	5 U	**98**	**51**	1.5 J	**2400 D**	**2500 D**	1.9 J	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	ND	2.4 J	3.2 J
sec-Butylbenzene	**5**	5.0 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	2.4 J	2.1 J	4.4 J	5 U	ND	ND	5 U	5 U	5 U	ND	ND	5 U	ND	1.1 J	5 U	**9.5**	**9.3**	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	ND	2.2 J	0.87 J
4-Isopropyltoluene	**5**	1.0 J	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	1.3 J	5 U	5 U	5 U	ND	ND	5 U	5 U	5 U	ND	ND	5 U	ND	5 U	5 U	5 U	5 U	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	ND	5 U	5 U
n-Butylbenzene	**5**	5.0 U	3.6	2.9 J	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	**6.2**	3.5 J	**7.1**	5 U	ND	ND	5 U	5 U	5 U	ND	ND	5 U	3.4 J	4.1 J	5 U	**39**	**49**	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	ND	5 U	5 U
Naphthalene	**10**	**430 D**	5	**25**	3.6 J	**16**	**180**	**33**	ND	4.9 J	3.2 J	ND	5 U	5 U	**100**	**36**	**89**	5 U	ND	ND	5 U	5 U	5 U	ND	ND	5 U	**14**	**11**	5 U	**360 D**	**380 D**	5 U	5 U	ND	5 U	5 U	ND	5 U	5 U	ND	5 U	ND	1.7 J	1.7 J
Total VOCs	**NA**	9173.4 JD	674.5 J	464	86.2	207.4 J	1413	249	158	864.2	47.4	37	18	11	2340.2	1173	2199.9	84	110	57.6 J	4.4	10	0	0	0	0	763.6 J	177.2	19.3	22197.5	15601.3	103.5	71	32	66	8	260	340	110	290	410	672.1 J	1677.3	893.1

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Notes:

- **Bold** denotes parameter above associated NYSDEC regulated or guidance value.
- micrograms per Liter and micrograms per kilogram are approximately equivalent to parts per billion (ppb)
- ND denotes Non Detect
- NL denotes Not Listed
- NYSDEC denote New York State Department of Environmental Conservation
- TOGS 1.1.1 denotes NYSDEC Division of Water Technical and
- USEPA denotes United States Environmental Protection Agency

Laboratory Data Qualifiers

D For Organics analysis, this flag indicates the compound concentration was obtained from a diluted analysis.
J For Organics analysis, this flag indicates an estimated value due to
U Not Detected. This compound was analyzed-for but not detected. For Organics analysis the reporting limit (lowest standard concentration) is the value listed. For Inorganics analysis, the value listed is the detection limit. For Inorganics analyzed using SW-846 methods, the detection limit is the Method Detection Limit, for Inorganics analyzed using EPA CLP and NY ASP CLP methods, the detection limit is the Instrument Detection Limit.

LABELLA
LaBella Associates, P.C.
300 State Street
Rochester, New York 14614

Figures

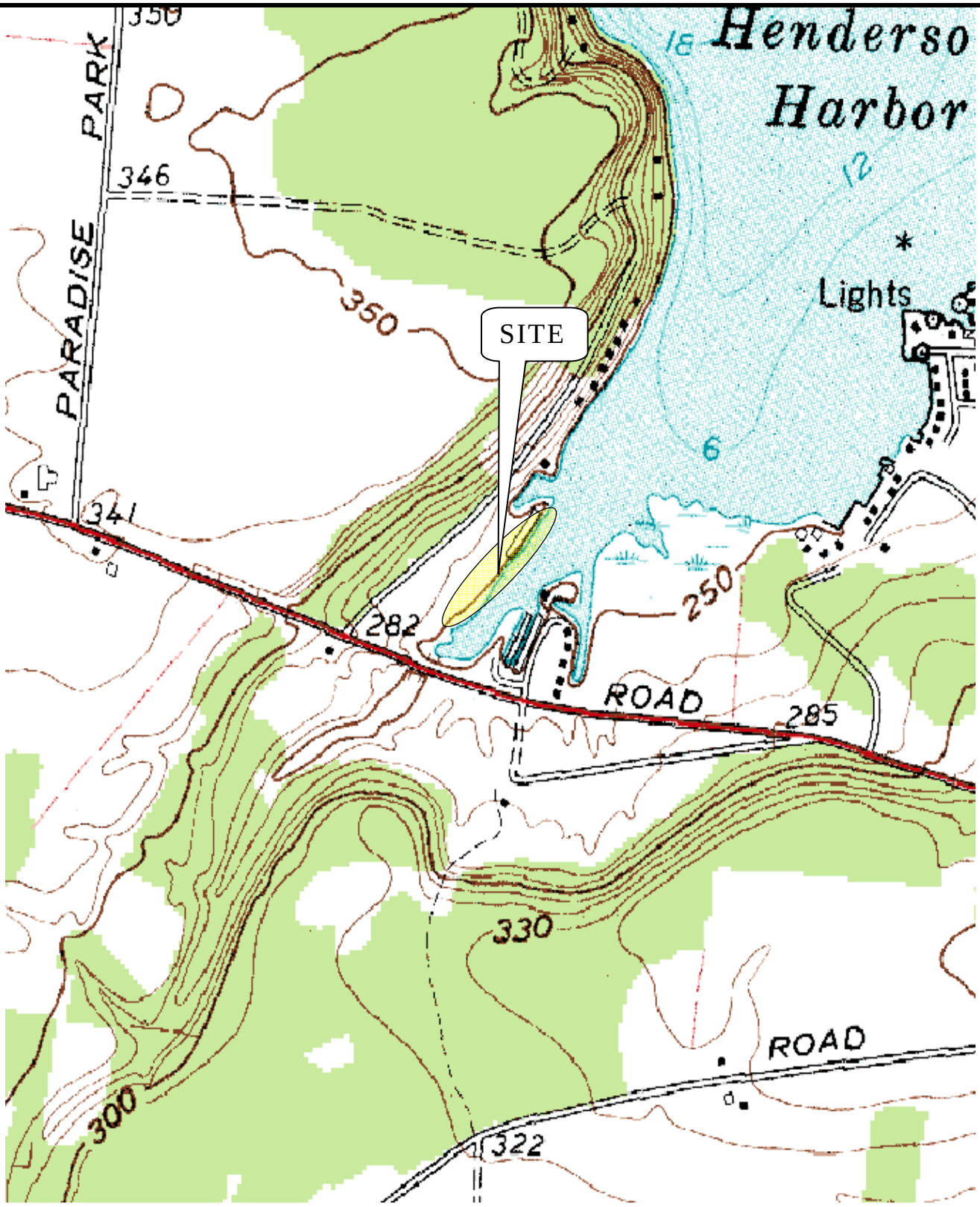

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FIGURE 1
Site Location Map

Lake Ontario Mariner's Marina
12548 Eastman Tract
Henderson Harbor, New York

LABELLA Associates, P.C.

PROJECT NO. 207820

Y:\Upstate National Bank\207820\Figures\Figure 1.DOC

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www.labellapc.com

IRM Report
NYSDEC VCA Index
No. A4-0463-0602
Lake Ontario Mariners Marina
12548 Eastman Tract
Henderson Harbor, New York

Client:
The Upstate National Bank

Site Area Map

N
W E
S

50 0 150
1 inch = 150 feet

207820

FIGURE 2

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Well Location and Site Feature Map

N W E S

10 0 20
1 inch = 20 feet

207820

FIGURE 3

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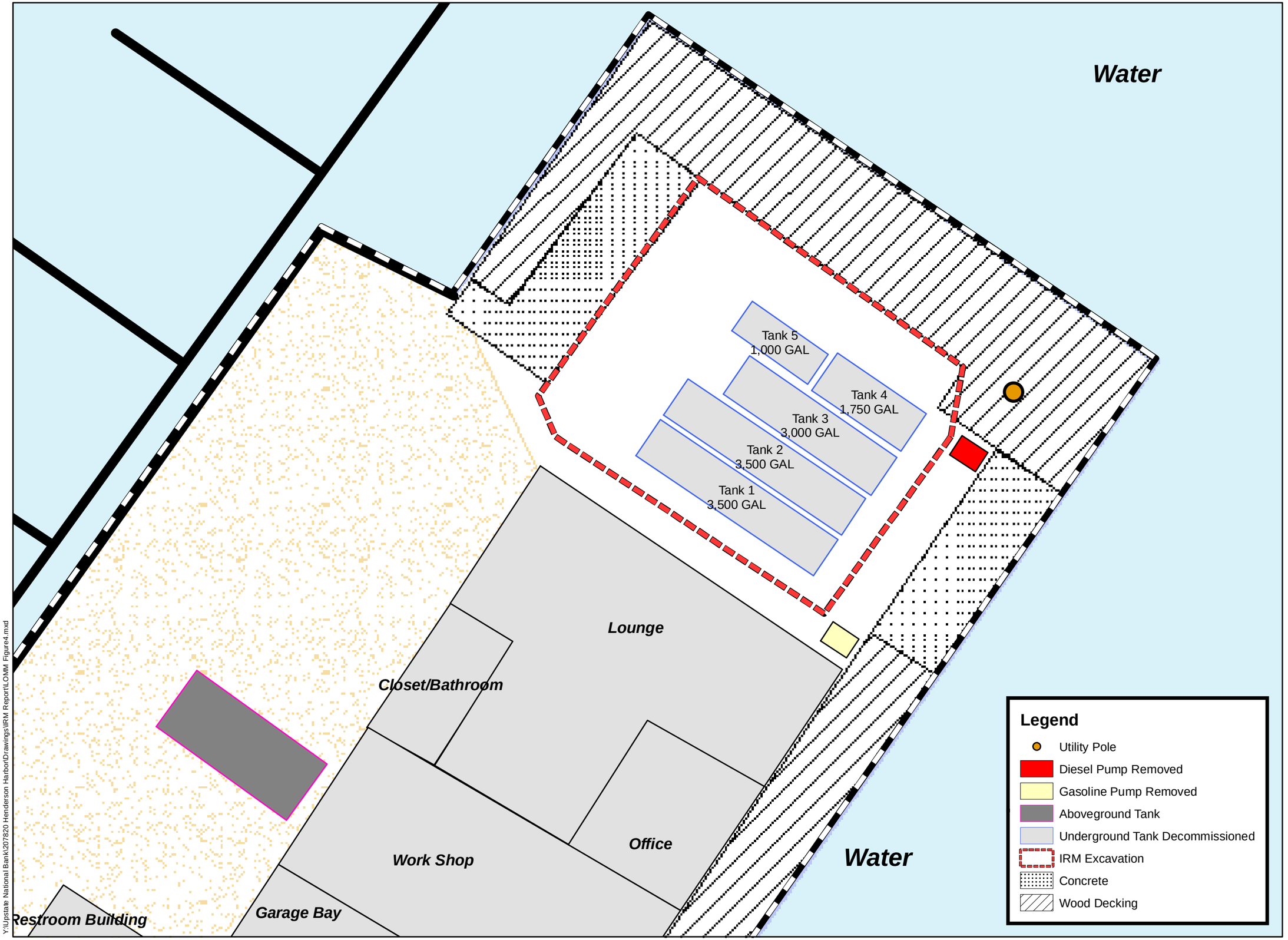

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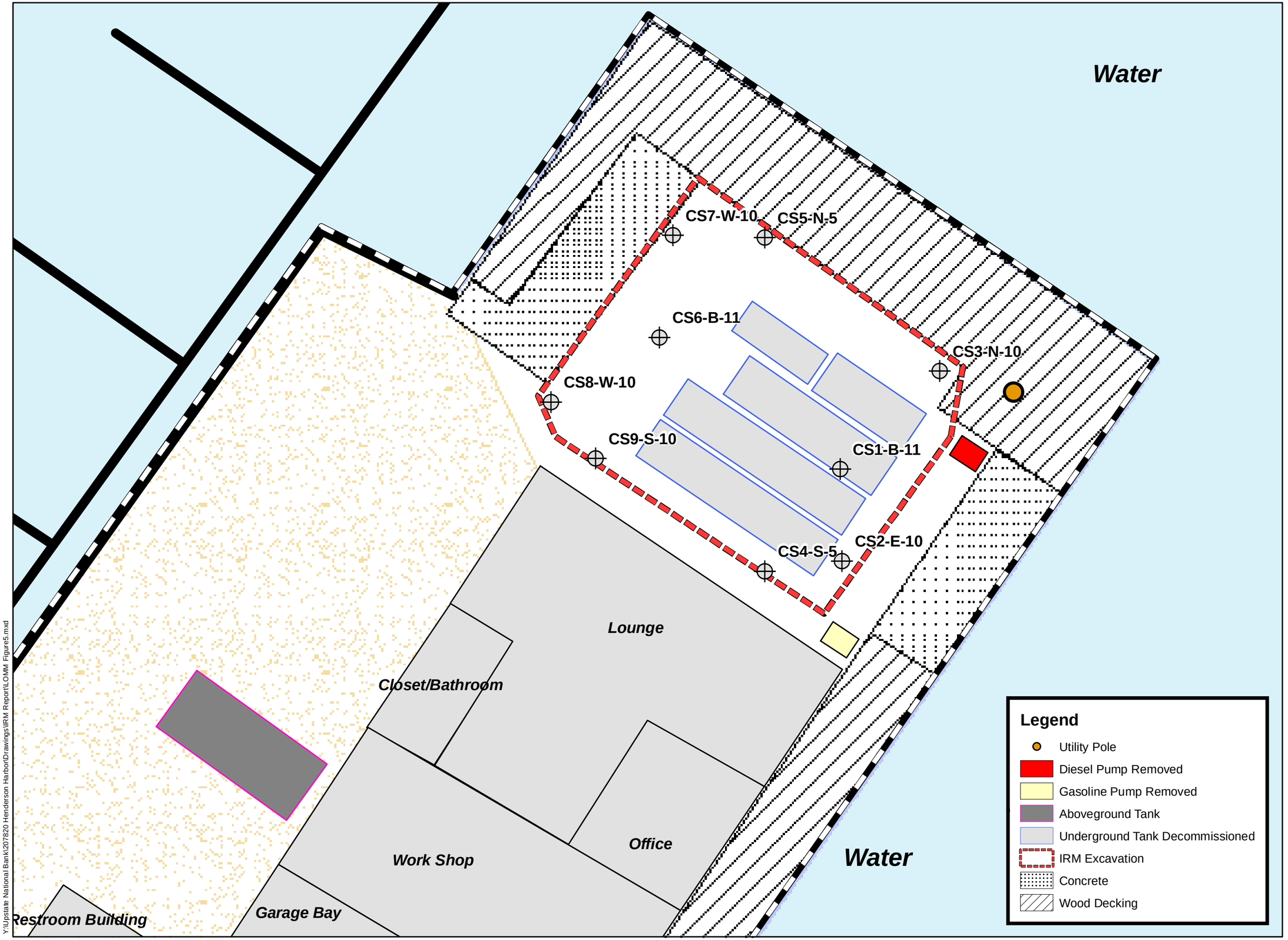
Decommissioned Tank and Pump Location Map

207820

FIGURE 4



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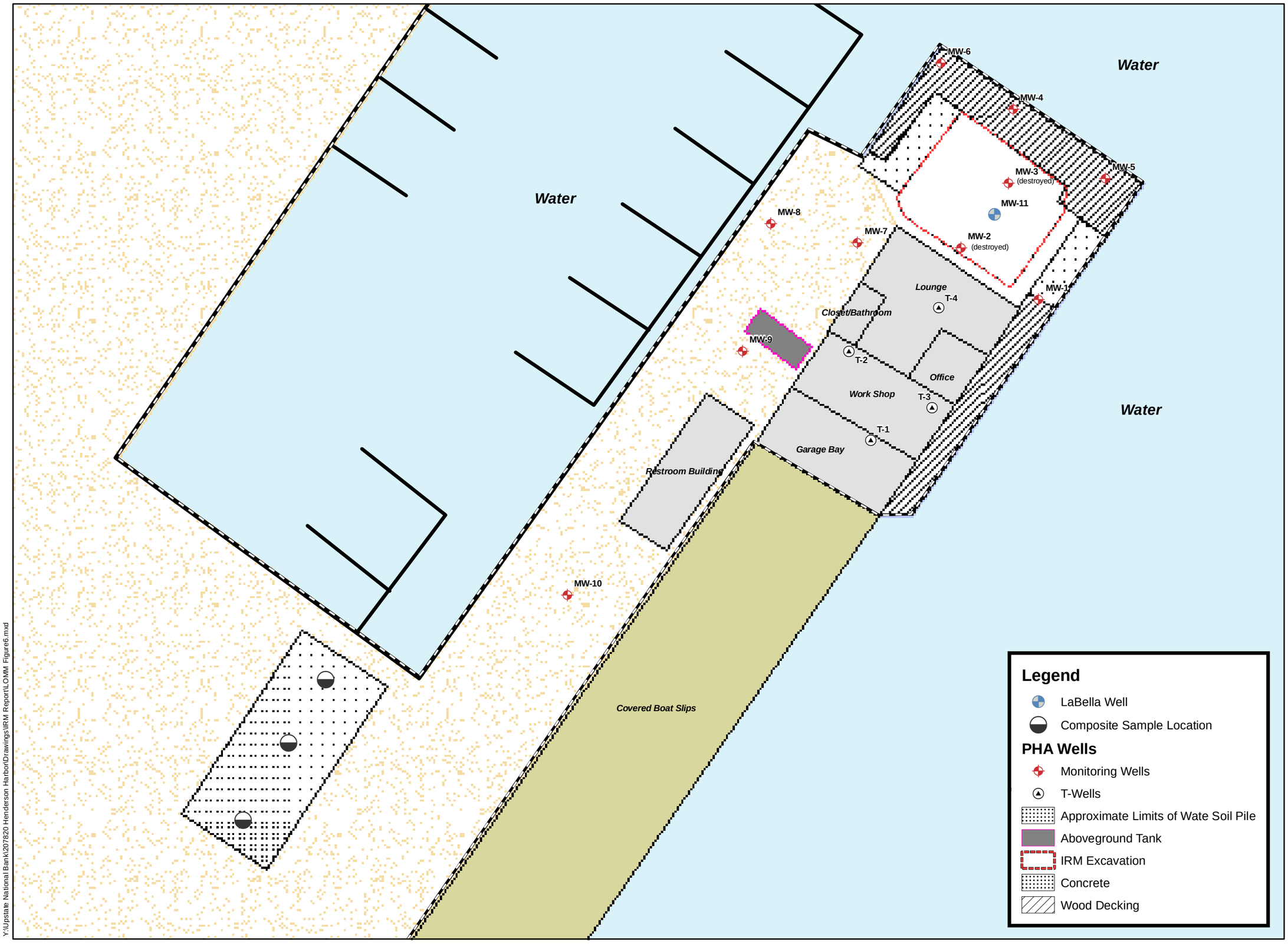
Confirmation Sample and IRM Excavation Location Map

207820

FIGURE 5



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Client:
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Waste Soil Pile and Composite Sample and Well Locations

207820

FIGURE 6

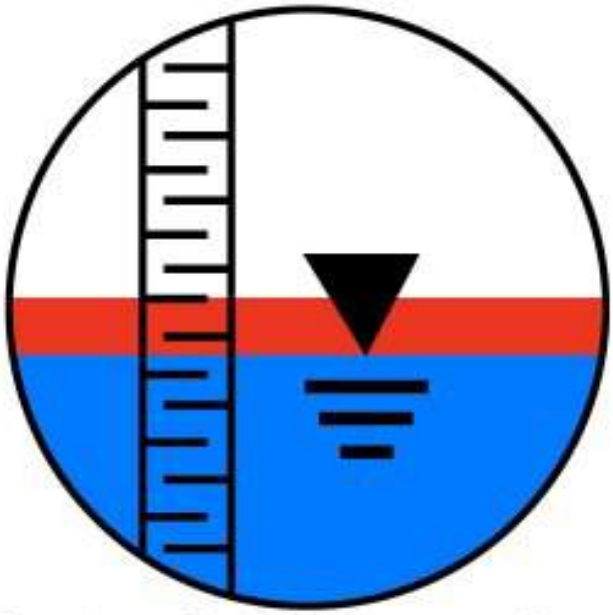
APPENDIX E

Air Sparge and Compressor Operation, Maintenance, and Monitoring Manual

ENVIRO-EQUIPMENT, INC.
10120 Industrial Drive
PINEVILLE, NC 28134
704-556-7723 - Phone
704-556-7228 - Fax
www.enviroequipment.com

SYSTEM MANUAL

Air Sparge Skid 2951
LaBella Associates



Enviro-Equipment, Inc.

ENVIRO-EQUIPMENT, INC.
10120 Industrial Drive
PINEVILLE, NC 28134
704-556-7723 - Phone
704-556-7228 - Fax
www.enviroequipment.com

EEI JOB 2951 - Operation and Maintenance Manual

General

- FIRST - Review all manufacturer documentation.
- Perform and document routine maintenance at manufacturer recommended intervals. Documentation of routine maintenance performed at manufacturer recommended intervals must be provided when making a warranty claim. Failure to perform and document routine maintenance at manufacturer recommended intervals will void any warranty claims.
- Only qualified individuals should connect, start up, operate, maintain and decommission this system.

System Control Panel

- FIRST – Review all control panel documentation.
- A licensed electrician should bring power from the electrical service into the main system control panel.
- Check all wiring connections for proper tightness and torque before powering the system. Verify proper grounding at the control panel. Verify all selector switches are in the OFF position. Verify all valve settings on each system component are set properly for startup.
- Verify proper voltage at the top of disconnect or main terminal block in the main system control panel enclosure.
- Close and secure the enclosure then turn power on to the system.
- Set the solenoid valve timers to the desired timing intervals. Ensure that at least one valve is open at all times. Do not run compressor without any solenoid valves open or it may damage the compressor!
- Turn all HOA switches to the auto position. Operating in hand mode is for testing purposes only. Damage to the system may result from continuously operating in hand mode which will void the warranty.

Troubleshooting

Component	Problem	Possible Cause	Solution
Any Pump or Blower Motor	Will not run in hand	Tripped overload or Faulty Component	Check to see if overload if tripped, if not tripped, contact EEI about faulty component
Air Sparge Compressor	Air Sparge Compressor will not operate	Heat Exchanger Interlock	Make sure Heat Exchanger is operating

Air Sparge Equipment

- FIRST – Review all Air Sparge Equipment documentation.
- Ensure valves are open in pressure lines. If the system has a bleed off valve open it completely. Start the compressor up under as little pressure as possible and increase the pressure gradually as needed once started up.
- Ensure rotation is correct by “bumping” the compressor on in hand mode and then off. Check rotation against rotation arrows or see if there is air pressure at the pressure connection.
- Do not operate beyond maximum pressure capacity of the compressor. Pressure relief valve should be set at maximum pressure threshold to protect the compressor.
- Check air filters per manufacturer’s recommendation or at least once a month. Clean and replace as necessary.

Enviro-Equipment, Inc.

COMPONENT TRACEABILITY RECORD
for
INDUSTRIAL CONTROL PANELS

Project:

Label Serial Number: 2951

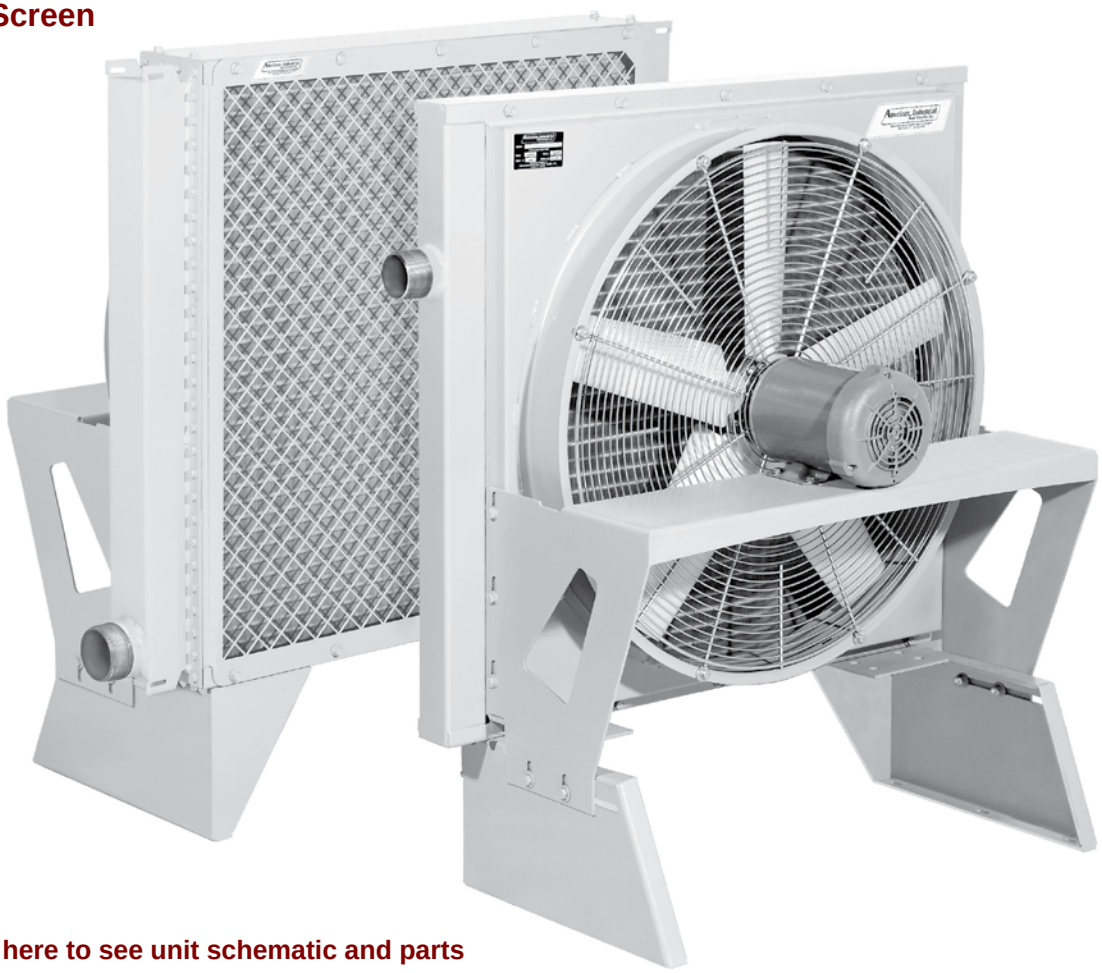
COMPONENT	MANUFACTURER	MODEL NUMBER	CERTIFIED BY
CONTACTOR	ETN.	XTCE007B10A	UL
OVERLOAD	ETN.	XTOB004BC1	UL
BREAKER	ETN.	FAZ-D10/2	UL
TIMER	INTERMATIC	MIL72ST42-120	UL
DIS-BLOCK	LITTELFUSE	LD25701	SA
BOX	COOPER B LINE	242410-SDM1-15	UL
SURGE PROTECTIVE	ETN.	SPI-2405	UL
TERMINAL	EATON	XBUT4	UR
GROUND BAR	EATON	GBK5	UL
SWITCH ASSY	EATON	M22WRLK3-2-G-K20 230G	UL
E-STOP SW	EATON	M22 PVT K01	UL
HOUR METER	EATON	6-T-3H-508RPM 406	UL
BREAKER	EATON	WM~~ZT~~-D03	UL

Note: A Bill of Material or Component list if prepared in advance can be attached to the document.

I certify that the components as listed, or the attached list of components have been reviewed for acceptance under the Panel Listing Program. These components are either certified , listed, or recognized by a component approving agency. Unevaluated Control Components protected by a listed GFCI may be used in accordance with UL5-8A for U.S. panels, however no unevaluated components are authorized for panels approved for Canada.

SIGNATURE: [signature] DATE: 7-25-14

Fit to Screen



Click here to see unit schematic and parts

AIR COOLED

AFTERCOOLERS

For Compressed Gas or Vapor

- Computer Selection.
- Low pressure drop available.
- Standard ports NPT, optional ANSI flange.
- Operating temperature of 400° F & pressure of 150PSI.
- Custom designs to fit your needs.
- Cools: Air, Compressors, Blowers, Steam vapors, Pneumatic systems, Vapor recovery systems etc...

 355 American Industrial Drive LaCrosse, VA 23950 tel: 434-757-1800 fax: 434-757-1810 email: sales@aihti.com

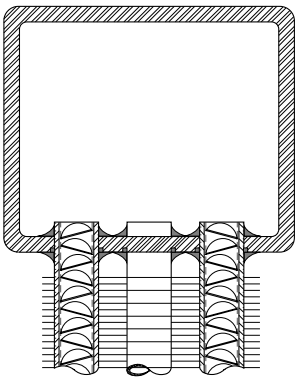
ACA - 3181 through ACA - 4362

Brazed Core Construction

Air coolers are an essential part of any compressed air system, by cooling the air, and condensing water vapor into a liquid state for removal. When air is compressed, the compression induces heat into both the air and the water entrained in the air.
The American Industrial ACA series heat exchanger cools air with air, making it a simple inexpensive way to cool when compared to other water-cooled or refrigerant cooled systems. The unique compact brazed fin/tube design provides efficient cooling and low maintenance under the warmest environmental conditions. By using an ACA series air-cooled after cooler, machine tools will recieve cooler dryer air, provide longer trouble free life, experience less down time, and be cost effective to operate on a continuous basis.

SUPERIOR COOLING FINS

Copper tubes are mechanically bonded to highly efficient aluminum cooling fins. Die-formed fin collars provide a durable precision fit for maximum heat transfer. Custom fin design forces air to become turbulent and carry heat away more efficiently than old flat fin designs.



TANKS

State-of-the-art high temperature brazing method insures permanent bond and positive contact of tube to manifold, eliminating leaks and providing maximum service life.

CONSTRUCTION MATERIALS & RATINGS

Standard Construction Materials		Standard Unit Ratings	
Tubes	Copper	Operating Pressure	150 psig
Fins	Aluminum	Operating Temperature	400 °F
Cabinet & Pipes	Steel	Consult factory for optional materials and ratings.	
Fan Guard	Zinc Plated Steel		
Manifolds	Steel		

note: AIHTI reserves the right to make reasonable design changes without notice.

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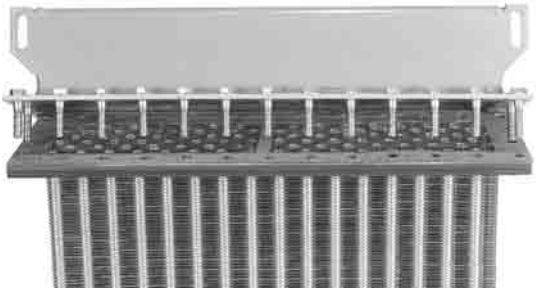
ACA - 6301 through ACA 6602

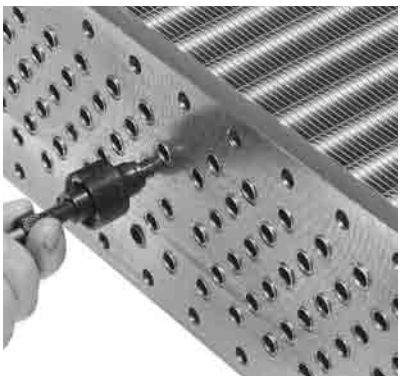
Serviceable Core® Construction

Air coolers are an essential part of any compressed air system, by cooling the air, and condensing water vapor into a liquid state for removal. When air is compressed, the compression induces heat into both the air and the water entrained in the air.
The American Industrial ACA series heat exchanger cools air with air, making it a simple inexpensive way to cool when compared to other water-cooled or refrigerant cooled systems. The unique compact *serviceable core®* design provides efficient cooling and low maintenance under the warmest environmental conditions. By using an ACA series air-cooled after cooler, machine tools will recieve cooler dryer air, provide longer trouble free life, experience less down time, and be cost effective to operate on a continuous basis.

SERVICEABLE CORE®

Core covers disassemble for easy access and cleaning. Repairable design for applications that require limited down time or in the event of a mishap requiring repair. Roller expanded tube to tube-sheet joint. 100% mechanical bond. Positive gasket seal is field replaceable for field maintenance or repair.





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Fins	Aluminum	Operating Temperature	400 °F
Cabinet & Pipes	Steel	Consult factory for optional materials and ratings.	
Fan Guard	Zinc Plated Steel		
Manifolds	Steel		

note: AIHTI reserves the right to make reasonable design changes without notice.

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Compressed Air

Normally air compressors have airflow rates based upon the horsepower. Rotary Screw compressors normally discharge air at 180 °f - 200 °f, prior to after-cooling. Reciprocating compressors normally discharge air at 250 °f - 275 °f, prior to after-cooling. Compressors are rated in CFM or cubic feet per minute of free air at inlet conditions. For practical purpose we will use sea level at 68 °f and 36% relative humidity as a norm. Altitude, differing ambient conditions with respect to temperature and humidity will all affect heat exchanger performance to a degree. Moisture content in air actually increases the Btu/hr load requirement for cooling air by adding an additional condensing load to the gas load requirement. As air rapidly cools, moisture in the compressed air stream will condense and separate into droplets, the more humidity present the more condensation will occur.

Sizing

The performance curves provided are for air. However, gases other than air may be applied to this cooler with respect to compatibility by applying a correction factor. Please take time to check the operating specifications thoroughly for material compatibility, pressure, and size before applying an American Industrial heat exchanger into your system.

Terms

Approach Temperature is the desired outlet temperature of the compressed gas minus the inlet ambient air temperature of the external air flowing over the coil.
SCFM (Standard Cubic Feet per Minute)
A cubic foot of air at 68 °f, 14.696 psia, & 36% relative humidity, per minute.
CFM (Cubic Feet per Minute)
Air at inlet atmospheric conditions.
ACFM (Actual Cubic Feet per Minute)
Air at current pressure, temperature, & humidity conditions without reference to a standard.

To Determine the Heat Load

If the heat load (Btu/hr) is unknown a value can be calculated based upon system operational requirements. To properly calculate the heat load (Btu/hr) to be rejected, several items must be known with certainty (see below).

- Flow rate SCFM (standard cubic feet pr minute)
- Type of gas and its makeup.
- System inlet pressure to the heat exchanger.
- Ambient temperature where the heat exchanger will be located (hotest condition).
- Temperature of the gas at the heat exchanger inlet.
- Temperature of the gas desired at heat exchanger outlet.
- Maximum acceptable pressure loss or cooled gas.

Using The Chart

American Industrial has created a quick reference chart for selecting ACA heat exchangers for Rotary Screw compressors (see page 214) [This chart offers basic information based upon compressor horsepower and average airflow rates. To properly use the chart, select the compressor horsepower at the left or the air flow rate. Next select the approach to ambient that is desired. Where the two columns intersect is shown the proper ACA model number.]

Using The Graphs

American Industrial provides performance graphs for ease of model selection. The following calculation examples (page 213), illustrate formulas to determine model selection sizes. It should be noted that there are some assumptions made when applying the basic principles for calculation in the formula. Altitude, humidity, materials, pressures, etc... all contribute to the final selection. Contact American Industrial for more detailed calculation.

Selection

The selection process is important, many considerations should be made when selecting a heat exchanger. Once the proper Fs requirement is calculated, it is time to apply the data to the graph and make a selection.
1) Find the Flow rate in SCFM located at the bottom of the graph. Follow the graph line up until it matches the calculated Fs from your calculations. If the point falls just above one of the model graphed lines, select the next larger size. If the point is on a line select it as your choice.
2) Check carefully the pressure differential. Units with operating pressures from 70+ psig will have no greater than 2.0 psid within the published flow range. For lower inlet pressure see the pressure drop curves for more detail.
3) Calculate a Nozzle size using the nozzle size calculation to verify your selection has the proper port sizes for your required inlet pressure.

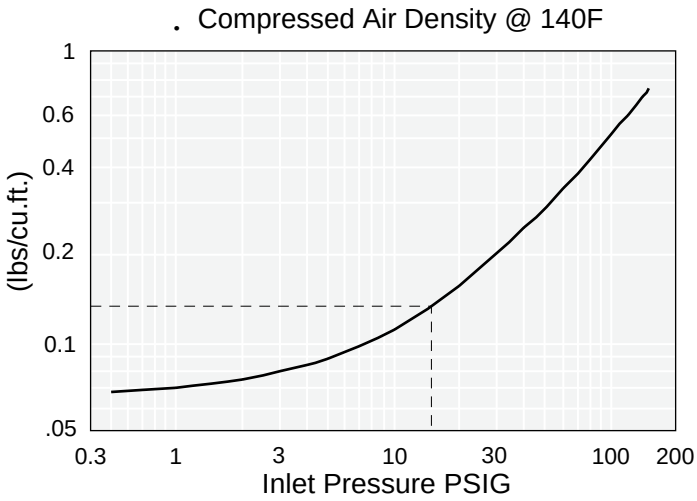
Formula: Nozzle Calculation

$$\text{Nozzle Size} = \sqrt{\frac{\left[\frac{(\text{SCFM} \times 4.512)}{(270{,}000 \times d)} \times 144\right]}{.7854}}$$

All numbers in equation are constants except for SCFM and (d) "density".

Example:
Flow rate = 200 SCFM
Pressure = 15 psig
Density = (d) from Compressed Air Density Graph

$$\sqrt{\frac{\left[\frac{(200 \times 4.512)}{(270{,}000 \times .14)} \times 144\right]}{.7854}} = 2.09\text{" or (2" Nozzle)}$$



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Examples: (Note: All air flow rates must be converted to SCFM)

Application 1 Air Rotary Screw Compressor

Determine the heat load "Q" =Btu/hr — $Q = [SCFM \times CF \times (T_1-T_2)]$ or $[350 \times 1.13 \times 105^{o}] = 41{,}528$ Btu/hr

T_1 = Inlet gas temperature: 200°f

T_2 = Outlet gas temperature: Ambient + 10°f= (95°f) — Determine the Fs = $\frac{Btu/hr}{T_2 - T_a}$ or $\frac{41{,}528}{10}$ = **4,153 Fs** Refer to graph example on page 215

T_a = Ambient temperature: 85°f

Airflow rate: 350 SCFM

PSIG = Operating Pressure 100 psig

CF = Correction factor: 1.13 — $CF = (.0753 \times S \times C \times 60)$ or $(.0753 \times 1.0 \times .25 \times 60) = 1.13$

S = Specific gravity with air being 1.0

C = Specific heat (Btu/Lb °f): .25

Model Selection - ACA-4362

$$\sqrt{\frac{\left[\frac{(350 \times 4.512)}{(270{,}000 \times .50)} \times 144\right]}{.7854}} = 1.46\text{" or (1.5" minimum nozzle)}$$

Application 2 Methane Gas

Determine the heat load "Q" = Btu/hr — $Q = [SCFM \times CF \times (T_1-T_2)]$ or $[500 \times 1.428 \times 210^{o}] = 149{,}940$ Btu/hr

T_1 = Inlet gas temperature: 300°f

T_2 = Outlet gas temperature: 90°f — Determine the Fs = $\frac{Btu/hr}{T_2 - T_a}$ or $\frac{149{,}940}{30}$ = **4,998 Fs** Refer to graph example on page 215

T_a = Ambient temperature: 60°f

Gas flow rate: 500 SCFM

PSIG = Operating pressure: 150 psig

CF = Correction factor: 1.428 — $CF = (.0753 \times S \times C \times 60)$ or $(.0753 \times .55 \times .575 \times 60) = 1.428$

S = Specific gravity with air being 1.0: .55

C = Specific heat (Btu/Lb °f)

Model Selection - ACA-6421

$$\sqrt{\frac{\left[\frac{(500 \times 4.512)}{(270{,}000 \times .74)} \times 144\right]}{.7854}} = 1.44\text{" or (1.5" minimum nozzle)}$$

Application 3 Low Pressure Blower

Determine the heat load "Q" = Btu/hr — $Q = [SCFM \times CF \times (T_1-T_2)]$ or $[76 \times 1.13 \times 150^{o}] = 12{,}882$ Btu/hr

T_1 = Inlet gas temperature: 250°f

T_2 = Outlet gas temperature: 100°f — Determine the Fs = $\frac{Btu/hr}{T_2 - T_a}$ or $\frac{12{,}882}{10}$ = **1,288 Fs** Refer to graph example on page 215

T_a = Ambient temperature: 90°f

CF = Correction Factor: 1.13

PSIG = Operating pressure: 2 psig — To Convert

Airflow rate: 90 ACFM — ACFM to SCFM = $\frac{ACFM \times (PSIG + 14.7) \times 528}{(T_1 + 460) \times 14.7} = \frac{90 \times 16.7 \times 528}{710 \times 14.7} = 76$ SCFM

S = Specific gravity with air being 1.0

C = Specific heat (Btu/lb °f): .25

△P = 5" water column or less (example pg. 220)

Model Selection - ACA-3302

$$\sqrt{\frac{\left[\frac{(76 \times 4.512)}{(270{,}000 \times .075)} \times 144\right]}{.7854}} = 1.76\text{" or (2.0" minimum nozzle)}$$

Pressure Drop (see page 220 for graphs)

Since gas is compressible the density of the gas changes from one temperature or pressure to the next. While the mass flow rate may not change, the pressure differential across the heat exchanger will change dramatically from high (70-125 psig) to low (1-5 psig) pressure. A low pressure condition requires larger carrying lines to move flow than does the same gas rate under a higher pressure. At lower pressures the differential pressure across the heat exchanger can be quite high compared to the same flow rate at a higher pressure. For that reason it is suggested that the pressure differential graphs on page 220 be consulted prior to making your final selection.

The ACA series heat exchanger is designed to be easily modified to accept larger port sizes in the event your system pressure requires larger nozzles. Consult our engineering department for more exacting information regarding pressure differential issues.

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ACA Series *selection*

ROTARY SCREW COMPRESSORS
(200°F @125 PSI & 36% relative humidity)

Compressor Horse Power (HP)	Average Air Discharge Cubic feet per minute (SCFM)	Model Size Selection			
		*Approach Temperature °F (T_2 - T_a)			
		5°F	10°F	15°F	20°F
15	60	ACA - 3302	ACA - 3242	ACA - 3242	ACA - 3182
20	80	ACA - 3302	ACA - 3242	ACA - 3242	ACA - 3182
30	130	ACA - 3362	ACA - 3302	ACA - 3242	ACA - 3242
40	165	ACA - 3362	ACA - 3302	ACA - 3302	ACA - 3242
60	250	ACA - 4362	ACA - 3362	ACA - 3302	ACA - 3302
75	350	ACA - 6362	ACA - 4362	ACA - 3362	ACA - 3302
100	470	ACA - 6362	ACA - 6362	ACA - 3362	ACA - 3362
125	590	ACA - 6422	ACA - 6362	ACA - 4362	ACA - 3362
150	710	ACA - 6422	ACA - 6362	ACA - 6362	ACA - 4362
200	945	ACA - 6482	ACA - 6422	ACA - 6362	ACA - 6362
250	1160	ACA - 6482	ACA - 6422	ACA - 6362	ACA - 6362
300	1450	ACA - 6542	ACA - 6482	ACA - 6422	ACA - 6362
350	1630	ACA - 6542	ACA - 6482	ACA - 6422	ACA - 6362
400	1830	ACA - 6602	ACA - 6482	ACA - 6422	ACA - 6422
500	2150	ACA - 6602	ACA - 6542	ACA - 6482	ACA - 6422

***Approach Temperature**
the desired outlet temperature of the compressed gas minus the inlet ambient air temperature of the external air flowing over the coil.

$\mathbf{T_2}$ - Outlet gas temperature

$\mathbf{T_a}$ - Ambient temperature

Example of a model:

ACA - 3242 - 3 - __ - ____ - ____

Model
ACA

Size

Number of Passes
1P = 1 pass
2P = 2 pass

Drive Type
N = no motor
1 = single phase
3 = three phase
1EXP = single phase
3EXP = three phase
5 = 575 Volt

Connections
Blank = NPT
A = ANSI 150#RF Flange

Tubing
Blank = Copper
U = 90/10 Cu Ni
C = Carbon Steel

Coating
Blank = Enamel (standard)
G = Galvanize (cabinet)
T = Heresite (core)
X = Epoxy (core & cabinet)

Using the performance graphs (page 215)

The Flow vs. Fs graph is calculated based upon SCFM units.

To convert volumetric Actual Cubic Feet per Minute (ACFM) into Standard Cubic Feet per Minute (SCFM) see page 213 application 3.

To select a model, locate the flow rate in SCFM located at the bottom of the graph. Proceed upward on the graph until the SCFM flow rate intersects with the calculated Fs. The curve closest, on or above the intersection point is the proper selection.

Using the one pass graph or two-pass graph depends upon pressure differential, flow, and performance requirements. The actual surface area for one or two pass units is the same. However, the airflow velocity in the tubes increases with the number of passes giving slightly higher pressure differentials and better cooling performance.

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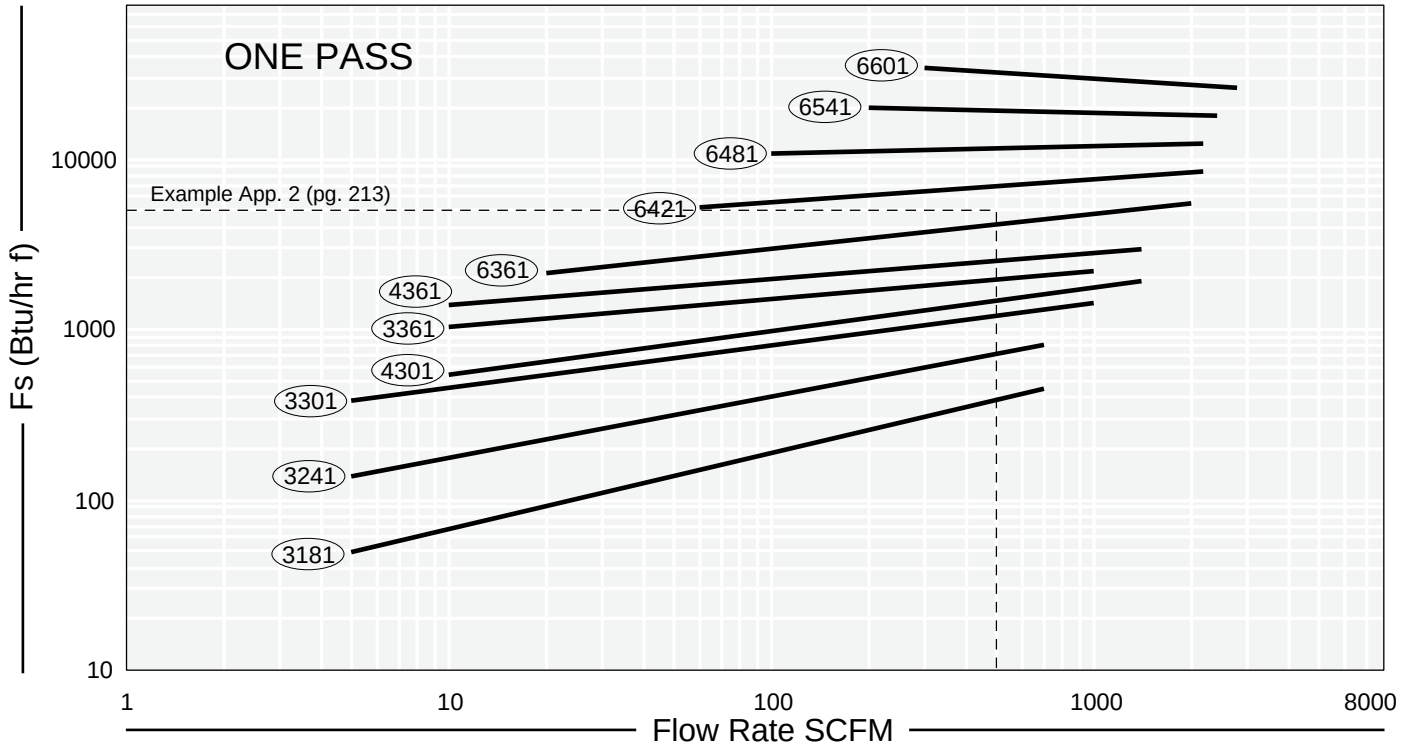

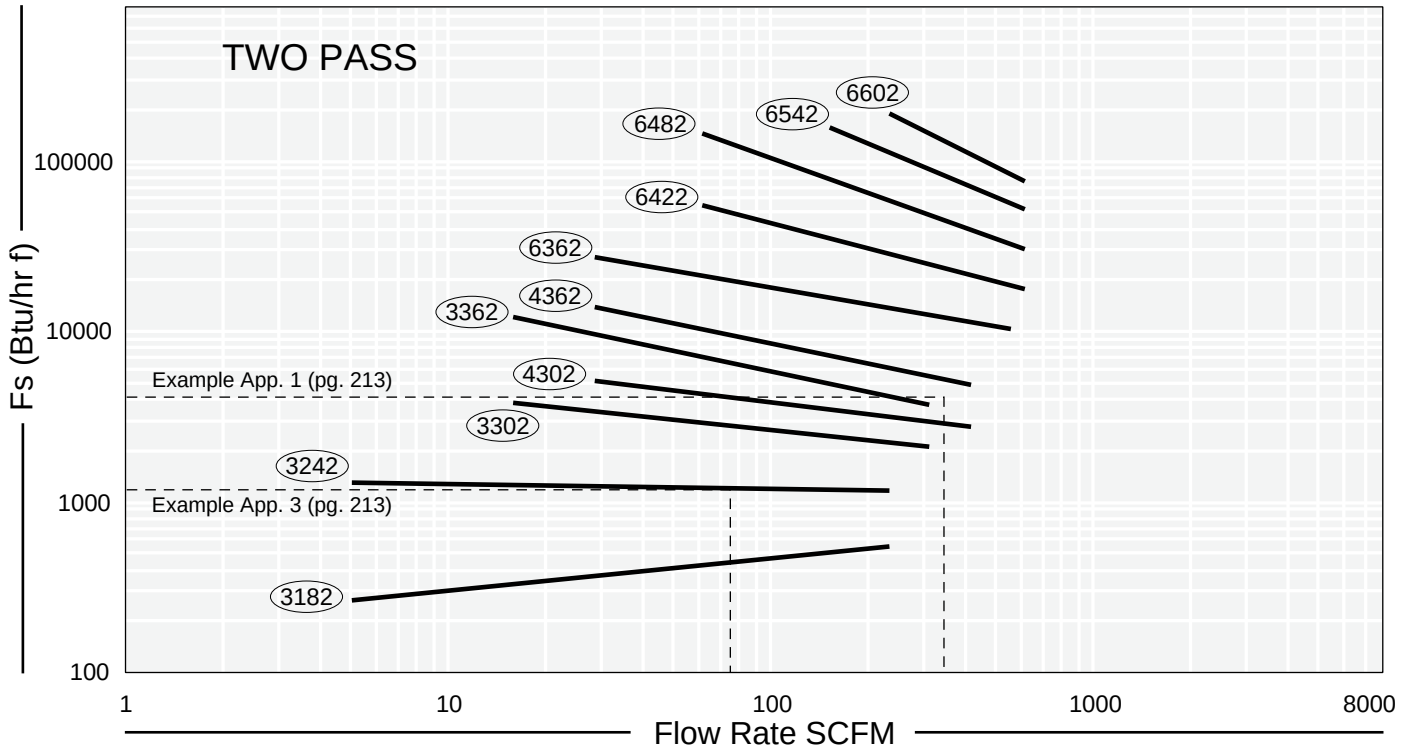

Example

Application #3 (p.5)

$$\mathbf{Fs} = \frac{\text{Heat Load (Btu/hr)}}{\text{Process exiting temperature } (T_2) - \text{Ambient air entering the cooler } (T_a) \text{ from cooler}}$$

SCFM = 76
ÐPSI required = 5" H2O
Model selection = ACA-6421-3
Fs = 1,288 Nozzle check (p.4) = 3.10 or 3"NPT

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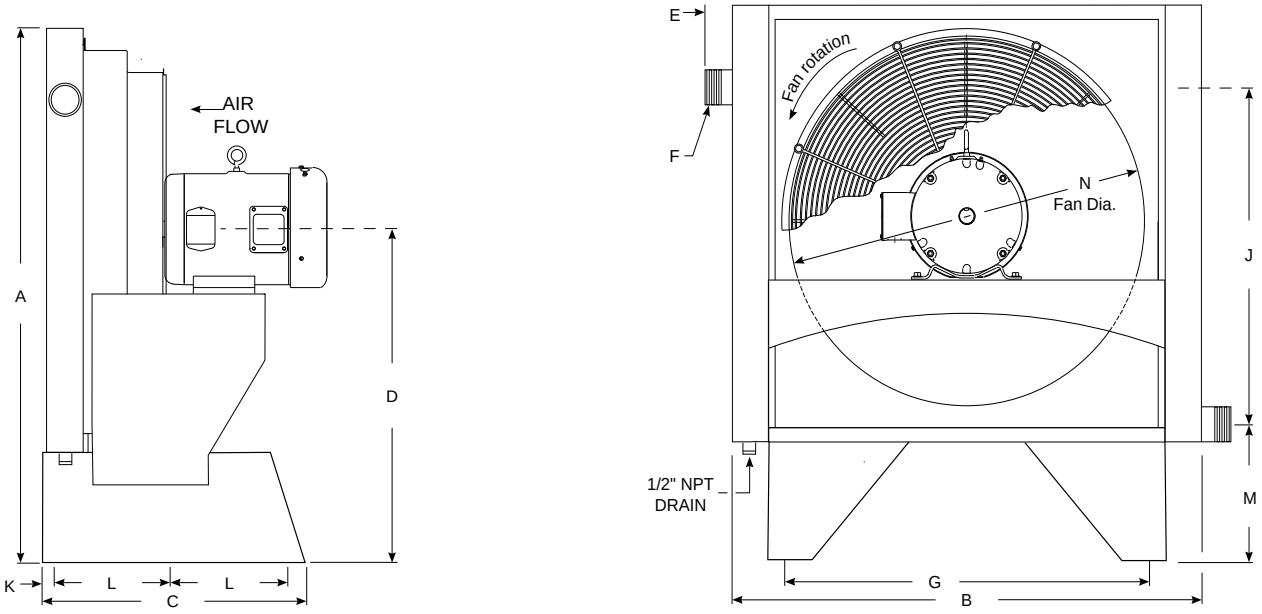
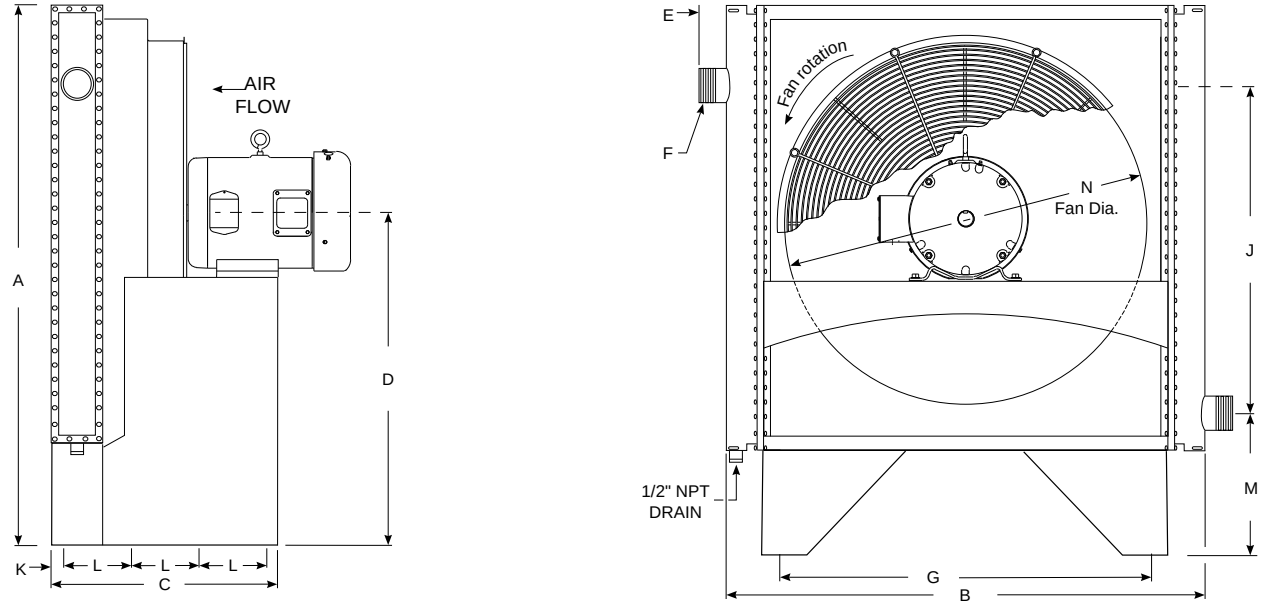
ACA Series *dimensions*



ACA - 3181 through ACA - 4361



ACA - 6301 through ACA - 6601

DIMENSIONS (inches)												
Model	A	B	C	D	E	F NPT	G	J	K	L	M	N
ACA - 3181	30.6	23.0	19.8	20.25	2.5	1.5	16.3	12.98	1.5	8.38	11.93	14.0
ACA - 3241	36.6	29.0	19.8	23.25	2.5	1.5	22.3	17.48	1.5	8.38	11.93	22.0
ACA - 3301	42.6	35.0	19.8	26.25	2.5	2.0	28.3	21.75	1.5	8.38	12.15	28.0
ACA - 4301	42.6	36.0	19.8	26.25	2.5	2.5	28.3	21.55	1.5	8.38	12.35	28.0
ACA - 6301	42.6	38.8	19.8	26.25	2.5	3.0	28.3	21.07	1.5	8.38	12.98	28.0
ACA - 3361	48.6	41.0	19.8	29.25	2.5	2.0	34.3	26.25	1.5	8.38	12.15	32.0
ACA - 4361	48.6	42.0	19.8	29.25	2.5	2.5	34.4	26.05	1.5	8.38	12.35	32.0
ACA - 6361	48.5	43.9	19.8	29.25	2.5	3.0	34.3	26.0	1.5	8.38	12.7	32.0
ACA - 6421	54.5	50.8	27.36	32.25	2.5	4.0	40.3	29.4	2.0	6.75	13.3	36.0
ACA - 6481	60.6	56.8	27.36	35.25	2.5	4.0	46.3	34.1	2.0	6.75	13.3	42.0
ACA - 6541	66.6	62.8	28.83	38.25	2.5	4.0	52.3	38.6	2.0	6.75	13.3	48.0
ACA - 6601	72.4	67.9	30.6	41.25	2.5	4.0	58.3	43.05	2.0	6.75	13.3	48.0

note: AIHTI reserves the right to make reasonable design changes without notice.

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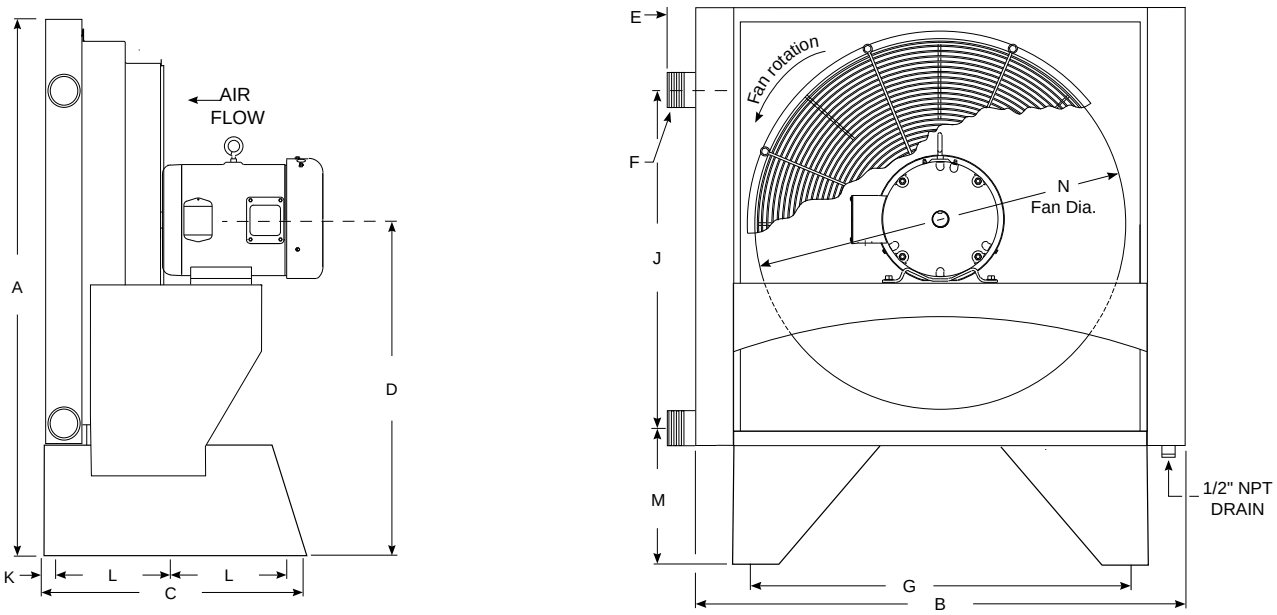
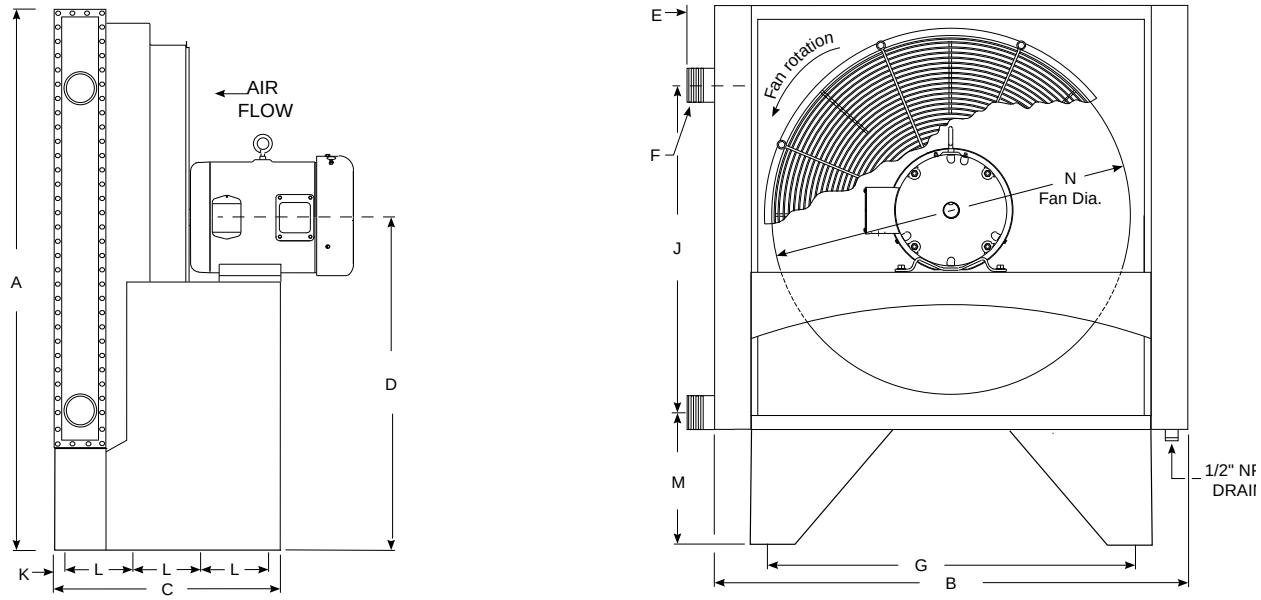


ACA - 3182 through ACA - 4362



ACA - 6302 through ACA - 6602

DIMENSIONS (inches)												
Model	A	B	C	D	E	F NPT	G	J	K	L	M	N
ACA - 3182	30.6	23.0	19.8	20.25	2.5	1.5	16.3	12.98	1.5	8.38	11.93	14.0
ACA - 3242	36.6	29.0	19.8	23.25	2.5	1.5	22.3	17.48	1.5	8.38	11.93	22.0
ACA - 3302	42.6	35.0	19.8	26.25	2.5	2.0	28.3	21.75	1.5	8.38	12.15	28.0
ACA - 4302	42.6	36.0	19.8	26.25	2.5	2.5	28.3	21.55	1.5	8.38	12.35	28.0
ACA - 6302	42.6	38.8	19.8	26.25	2.5	3.0	28.3	21.07	1.5	8.38	12.98	28.0
ACA - 3362	48.6	41.0	19.8	29.25	2.5	2.0	34.3	26.25	1.5	8.38	12.15	32.0
ACA - 4362	48.6	42.0	19.8	29.25	2.5	2.5	34.4	26.05	1.5	8.38	12.35	32.0
ACA - 6362	48.5	43.9	19.8	29.25	2.5	3.0	34.3	26.0	1.5	8.38	12.7	32.0
ACA - 6422	54.5	50.8	27.36	32.25	2.5	4.0	40.3	29.4	2.0	6.75	13.3	36.0
ACA - 6482	60.6	56.8	27.36	35.25	2.5	4.0	46.3	34.1	2.0	6.75	13.3	42.0
ACA - 6542	66.6	62.8	28.83	38.25	2.5	4.0	52.3	38.6	2.0	6.75	13.3	48.0
ACA - 6602	72.4	67.9	30.6	41.25	2.5	4.0	58.3	43.05	2.0	6.75	13.3	48.0

note: AIHTI reserves the right to make reasonable design changes without notice.

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ACA Series *motor data*

ELECTRIC MOTOR DATA

Model	Horse Power	Phase	Hz	Volts	RPM	NEMA Frame	Enclosure Type	Full Load Amperes	Service Factor	Thermal Overload
ACA- 3181/2- 1	.25	1	60-50	115/230 - 90/190	1725-1440	48	TEFC	3.2/1.6/2.8-1.4	1.15	NO
ACA- 3181/2 -3	.25	3	60-50	208 - 230/460 - 190/380	1725-1440	48	TEFC	1.3/.65/1.1-.55	1.15	NO
ACA- 3241/2 -1	.25	1	60-50	115/230 - 90/190	1140-950	56	TEFC	6.8/3.1-3.4	1.15	NO
ACA- 3241/2 -3	.25	3	60-50	208 - 230/460 - 190/380	1140-950	56	TEFC	1.7/2.0/1.0	1.15	NO
ACA- 3301/2 -1	.5	1	60-50	115/230 - 90/190	1140-950	56	TEFC	9.6/4.7-4.8/10.4/5.2	1.15	NO
ACA- 3301/2 -3	.5	3	60-50	208 - 230/460 - 190/380	1140-950	56	TEFC	2.4-2.7/1.35-2.5/1.25	1.15	NO
ACA- 4301/2 -1	.5	1	60-50	115/230 - 90/190	1140-950	56	TEFC	9.6/4.7-4.8/10.4/5.2	1.15	NO
ACA- 4301/2 -3	.5	3	60-50	208 - 230/460 - 190/380	1140-950	56	TEFC	2.4-2.7/1.35-2.5/1.25	1.15	NO
ACA- 6301/2 -3	1.0	3	60-50	208 - 230/460 - 190/380	1140-950	56	TEFC	4/2-3.7/1.85	1.15	NO
ACA- 3361/2 -3	1.0	3	60-50	208 - 230/460 - 190/380	1140-950	56	TEFC	4/2-3.7/1.85	1.15	NO
ACA- 4361/2- 3	1.0	3	60-50	208 - 230/460 - 190/380	1140-950	56	TEFC	4/2-3.7/1.85	1.15	NO
ACA- 6361/2 -3	3.0	3	60-50	208 - 230/460 - 190/380	1725-1440	182T	TEFC	8.4-6.8/3.4	1.15	NO
ACA- 6421/2 -3	5.0	3	60-50	208 - 230/460 - 190/380	1140-950	213T	TEFC	8.2-7.6/3.8	1.15	NO
ACA- 6481/2 -3	5.0	3	60-50	208 - 230/460 - 190/380	1140-950	213T	TEFC	14.0/7.0	1.15	NO
ACA- 6541/2 -3	7.5	3	60-50	208 - 230/460 - 190/380	1140-950	254T	TEFC	20.4/10.2	1.15	NO
ACA- 6601/2 -3	10	3	60-50	208 - 230/460 - 190/380	1140-950	256T	TEFC	28.0/14.0	1.15	NO

ELECTRIC MOTOR NOTES:

1) Motor electrical ratings are an approximate guide and may vary between motor manufacturers. Consult ratings on motor data plate prior to installation and operation.

2) Explosion proof, high temperature, severe duty, chemical, IEC, Canadian Standards Association, and Underwriters Laboratory recognized motors are available upon request.

3) American Industrial reserves the right to enact changes to motor brand, type and ratings regarding horsepower, RPM,FLA,and service factor for standard products without notice. All specific requirements will be honored without change.

4) Fan rotation is clockwise when facing the motor shaft.

5) The above motors contain factory lubricated shielded ball bearings (no additional lubrication is required).

6) **Abbreviation Index**

TEFC.....Totally Enclosed, Fan Cooled
EXP.....Explosion Proof

CLASS I,DIV.1, GROUP D or CLASS II,DIV.2, GROUP F & G EXPLOSION PROOF MOTOR DATA

Model	Horse Power	Phase	Hz	Volts	RPM	NEMA Frame	Enclosure Type	Full Load Amperes	Service Factor	Thermal Overload
ACA- 3181/2 -1	.25	1	60	115/230	1725	48	EXP	5.8/2.8	1.0	YES
ACA- 3181/2 -3	.25	3	60	208-230/460	1725	48	EXP	1.4-1.3/.65	1.0	YES
ACA- 3241/2 -3	.33	1	60	115/230	1140	56	EXP	7.8/3.5	1.0	YES
ACA- 3241/2 -1	.33	3	60	208-230/460	1140	56	EXP	1.18-1.6/8	1.0	YES
ACA- 3301/2 -3	.75	1	60	115/230	1140	56	EXP	9.4/4.8	1.0	YES
ACA- 3301/2 -1	.75	3	60	208-230/460	1140	56	EXP	2.5-2.4/1.2	1.0	YES
ACA- 4301/2 -3	.75	1	60	115/230	1140	56	EXP	9.4/4.8	1.0	YES
ACA- 4301/2 -1	.75	3	60	208-230/460	1140	56	EXP	2.5-2.4/1.2	1.0	YES
ACA- 6301/2 -1	1.0	3	60	230/460	1140	56	EXP	3.8/1.9	1.0	YES
ACA- 3361/2 -3	1.0	3	60	230/460	1140	56	EXP	3.8/1.9	1.0	YES
ACA- 4361/2 -3	1.0	3	60	230/460	1140	56	EXP	3.8/1.9	1.15	YES
ACA- 6361/2 -3	3	3	60	230/460	1725	182	EXP	8.8/4.4	1.15	YES
ACA- 6421/2 -3	5	3	60	230/460	1160	215	EXP	15.0-13.8/6.9	1.15	YES
ACA- 6481/2 -3	5	3	60	230/460	1160	215	EXP	15.0-13.8/6.9	1.15	YES
ACA- 6541/2 -3	7.5	3	60	230/460	1160	256	EXP	21.6-20.4/10.2	1.15	YES
ACA- 6601/2 -3	10	3	60	230/460	1160	256	EXP	29-26/13	1.15	YES

NOTE: Basic electric drive units are supplied with one of the corresponding above listed motors.

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575 VOLT ELECTRIC MOTOR DATA

Model	Horse Power	Phase	Hz	Volts	RPM	NEMA Frame	Enclosure Type	Full Load Amperes	Service Factor	Thermal Overload
ACA- 3181/2 -5	1/3	3	60	575	1725	56	TEFC	.52 .56	1.15	NO
ACA- 3241/2 -5	1/3	3	60	575	1140	56	TEFC	.52 .56	1.15	NO
ACA- 3301/2 -5	1/2	3	60	575	1140	56	TEFC	1.08	1.15	NO
ACA- 4301/2 -5	1/2	3	60	575	1140	56	TEFC	1.08	1.15	NO
ACA- 6301/2 -5	1	3	60	575	1140	56	TEFC	1.6	1.15	NO
ACA- 3361/2 -5	1	3	60	575	1140	56	TEFC	1.6	1.15	NO
ACA- 4361/2 -5	1	3	60	575	1140	56	TEFC	1.6	1.15	NO
ACA- 6361/2 -5	3	3	60	575	1725	182T	TEFC	3.3	1.15	NO
ACA- 6421/2 -5	5	3	60	575	1140	213T	TEFC	5.9	1.15	NO
ACA- 6481/2 -5	5	3	60	575	1140	213T	TEFC	5.9	1.15	NO
ACA- 6541/2 -5	7.5	3	60	575	1140	254T	TEFC	8.0	1.15	NO
ACA- 6601/2 -5	10	3	60	575	1140	256T	TEFC	10.5	1.15	NO

COMMON DATA

Model	Air Flow		Sound Level dB(A) @ 7ft	Weight		Serviceable Core
	CFM	m^3/s		w/ motor	w/o motor	
ACA-3181/2	1550	0.731	72	131	111	NO
ACA-3241/2	2900	1.36	76	154	134	NO
ACA-3301/2	4450	2.10	76	184	160	NO
ACA-4301/2	4450	2.10	76	211	187	NO
ACA-6301/2	4450	2.10	76	343	305	YES
ACA-3361/2	6350	2.99	79	243	205	NO
ACA-4361/2	6350	2.99	79	289	251	NO
ACA-6361/2	10500	4.95	91	402	342	YES
ACA-6421/2	14300	6.75	87	636	443	YES
ACA-6481/2	18700	8.82	88	753	560	YES
ACA-6541/2	23350	11.02	91	938	691	YES
ACA-6601/2	29300	13.83	91	1104	835	YES

NOTES:

TEFC = Totally Enclosed, Fan Cooled

To estimate the sound level at distances other than 7 feet (2.1 meters) from the cooler, add 6 db for each halving of distance, or sub-stract 6 db for each doubling of the distance.

Example:
The Sound Level of the ACA-3181/2 is 72 dB at 7ft. At 3.5ft (7ft x 0.5 = 3.5ft) the sound level is 66 dB (72dB - 6dB = 66dB). At 14ft (7ft x 2 = 14ft) the sound level is 78dB (72dB + 6dB = 78dB).

Pressure Drop Graphs (see page 220)

Each graph represents a specific pressure drop at differing flow rates and inlet pressures. The four graphs for each model series size represents the more popular milestone pressure differentials commonly applied.

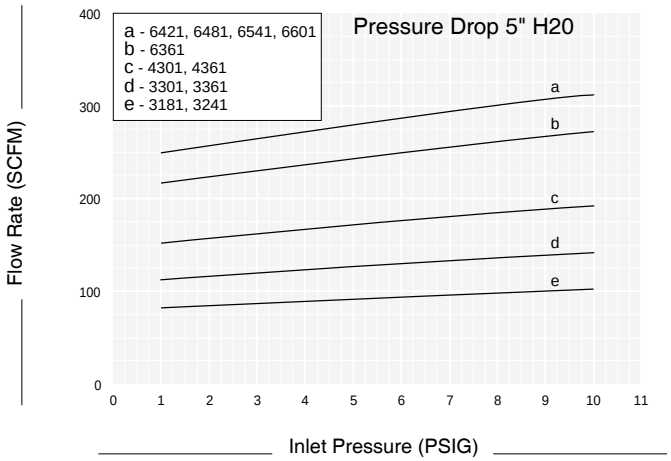
To use the graphs for selection purposes follw the steps below.

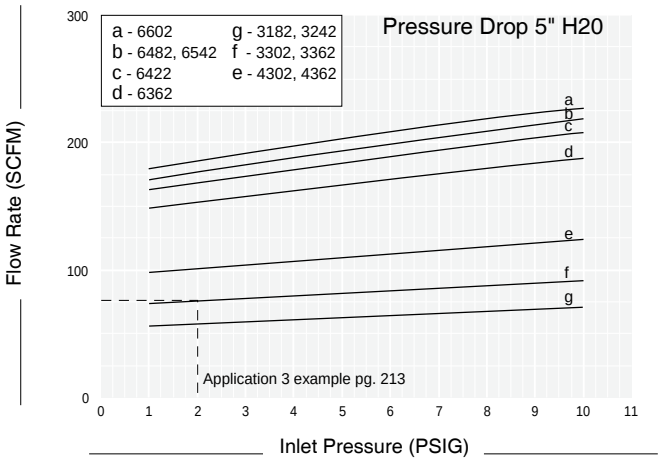
1) Locate the operating pressure at the bottom of the desired pressure drop chart.
2) Locate the flow rate in SCFM at the left end of the chart.
3) Follow the "Pressure" line vertically and the "Flow" line horizontally until they cross, note the location.
4) The curve on, or closest above will be exact or less pressure drop than requested and suitable for the application.
5) There may be several units shown above the intersection point, all of which will produce less than the desired pressure drop at the required flow.

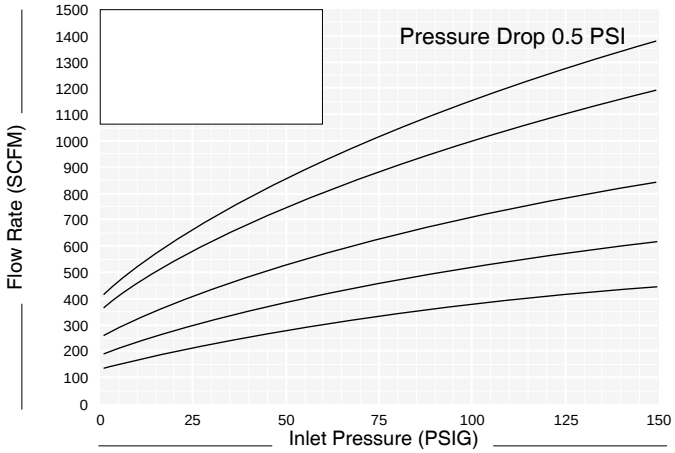
Example: Application 3 Low Pressure Blower

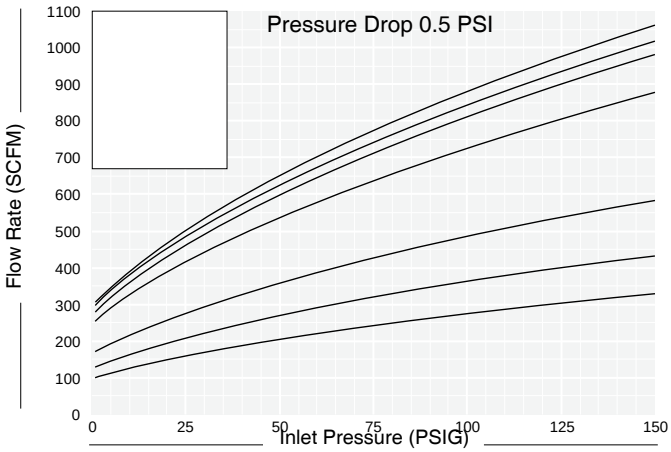
Flow = 76 SCFM
Operating pressure = 2 PSIG
Initial selection from graph page 215 = ACA-3302
Desired pressure drop = 5" H2O or less. (USE the "Pressure Drop 5" H20" curves page 220)
From the pressure drop graph, page 220. Acceptable choice - ACA-3302 is on the line, ACA-3242 is well below the line. The ACA-3302 meets the pressure drop requirement, but exceeds the capacity requirement. However, even though the ACA-3242 exceeds 5" of water pressure drop, other considerations should be made prior to selection such as unit physical size, cost, availability, and port size.

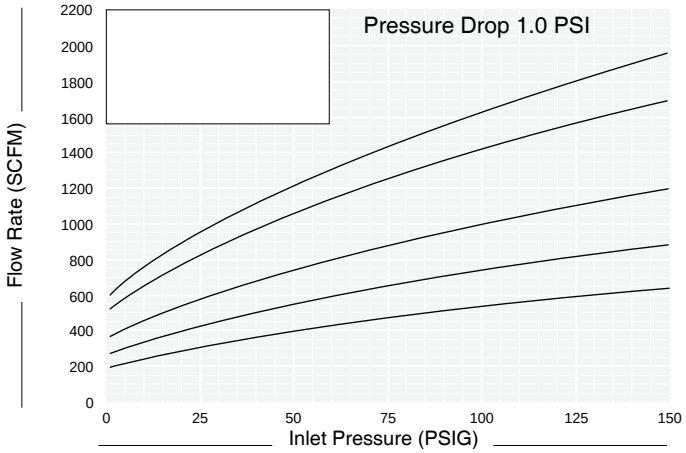
ACA Series *pressure drop graphs*

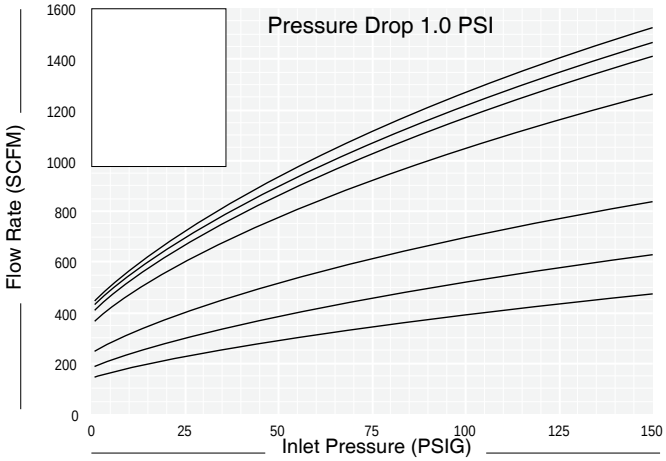


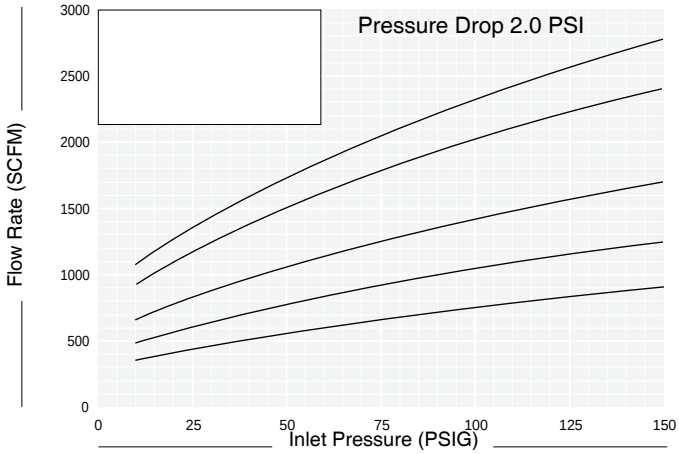


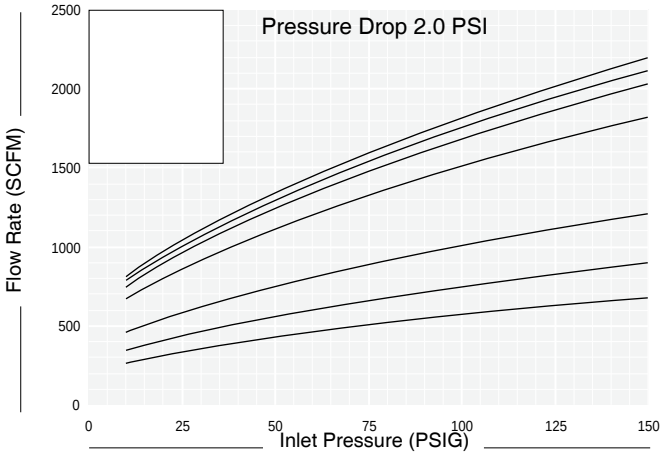












note: AIHTI reserves the right to make reasonable design changes without notice.

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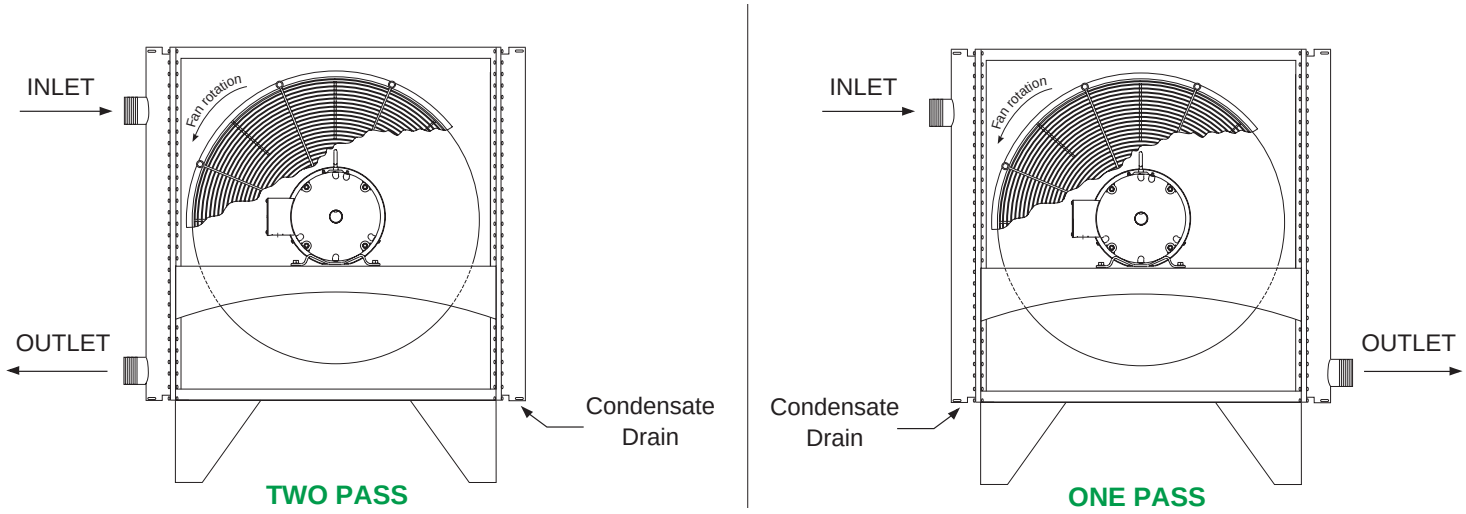
PIPING HOOK UP



Receiving:

a) Inspect unit for any shipping damage before uncrating. Indicate all damages to the trucking firms' delivery person and mark it on the receiving bill before accepting the freight. Make sure that the core and fan are not damaged. Rotate the fan blade to make sure that it moves freely. The published weight information located in this brochure is approximate. True shipment weights are determined at the time of shipping and may vary. Approximate weight information published herein is for engineering approximation purposes and should not be used for exact shipping weight. *Since the warranty is based upon the unit date code located on the model identification tag, removal or manipulation of the identification tag will void the manufacturers warranty.*

b) When handling the ACA heat exchanger, special care should be taken to avoid damage to the core and fan. All units are shipped with wood skids for easy forklift handling

c) Standard Enamel Coating: American Industrial provides its standard products with a normal base coat of oil base air cure enamel paint. The enamel paint is applied as a temporary protective and esthetic coating prior to shipment. While the standard enamel coating is durable, American Industrial does not warrantee it as a long-term finish coating. It is strongly suggested that a more durable final coating be applied after installation or prior to long-term storage in a corrosive environment to cover any accidental scratches, enhance esthetics, and further prevent corrosion. It is the responsibility of the customer to provide regular maintenance against chips, scratches, etc... and regular touch up maintenance must be provided for long-term benefits and corrosion prevention.

Installation:

a) American Industrial recommends that the equipment supplied should be installed by qualified personal who have solid understanding of system design, pressure and temperature ratings, and piping assembly. Verify the service conditions of the system prior to applying any ACA series cooler. If the system pressure or temperature does not fall within the parameters on ACA rating tag located on the heat exchanger, contact our factory prior to installation or operation.

b) In order for the heat exchanger to properly function, installation should be made with minimum airflow obstruction distance of not less than twenty (20) inches on both fan intake and exiting side of the heat exchanger.

c) Process piping should be as indicated above with the process flow entering into the upper port and exiting out the lower port (see illustration). This configuration will allow for condensate moisture to drain completely from the equipment. It is recommended that an air separator or automatic drip leg be applied to the outlet side of the heat exchanger to trap any moisture that develops.

d) Flow line sizes should be sized to handle the appropriate flow to meet the system pressure drop requirements. If the nozzle size of the heat exchanger is smaller than the process line size an increased pressure differential at the heat exchanger may occur.

e) ACA series coolers are produced with both brazed ACA-3181 through ACA-4362, and serviceable core® ACA-6301 through ACA-6602 style coils. A brazed construction coil does not allow internal tube access. A serviceable core® will allow full accessibility to the internal tubes for cleaning and maintenance. ACA series coolers are rated for 150 PSIG working pressure, and a 400°f working temperature.

f) Special Coatings: American Industrial offers as customer options, Air-Dry Epoxy, and Heresite (Air-Dry Phenolic) coatings at additional cost. American Industrial offers special coatings upon request, however American Industrial does not warrantee coatings to be a permanent solution for any equipment against corrosion. It is the responsibility of the customer to provide regular maintenance against chips, scratches, etc... and regular touch up maintenance must be provided for long-term benefits and corrosion prevention.

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g) Electric motors should be connected only to supply source of the same characteristics as indicated on the electric motor information plate. Prior to starting, verify that the motor and fan spin freely without obstruction. Check carefully that the fan turns in the correct rotation direction normally counter clockwise from the motor side (fan direction arrow). Failure to operate the fan in the proper direction could reduce performance or cause serious damage to the heat exchanger or other components. Fan blades should be rechecked for tightness after the first 100 hours of operation.

Maintenance

Regular maintenance intervals based upon the surrounding and operational conditions should be maintained to verify equipment performance and to prevent premature component failure. Since some of the components such as, motors, fans, load adapters, etc... are not manufactured by American Industrial maintenance requirements provided by the manufacture must be followed.

a) Inspect the entire heat exchanger and motor/fan assembly for loosened bolts, loose connections, broken components, rust spots, corrosion, fin/coil clogging, or external leakage. Make immediate repairs to all affected areas prior to restarting and operating the heat exchanger or its components.

b) Heat exchangers operating in oily or dusty environments will often need to have the coil cooling fins cleaned. Oily or clogged fins should be cleaned by carefully brushing the fins and tubes with water or a non-aggressive degreasing agent mixture (Note: Cleaning agents that are not compatible with copper, brass, aluminum, steel or stainless steel should not be used). A compressed air or a water stream can be used to dislodge dirt and clean the coil further. Any external dirt or oil on the electric motor and fan assembly should be removed. Caution: Be sure to disconnect the electric motor from its power source prior to doing any maintenance.

c) In most cases it is not necessary to internally flush the coil. In circumstances where the coil has become plugged or has a substantial buildup of material, flushing the coil with water or a solvent may be done. Flushing solvents should be non-aggressive suitable for the materials of construction. Serviceable Core® models can be disassembled and inspected or cleaned if required.

d) Most low horsepower electric motors do not require any additional lubrication. However, larger motors must be lubricated with good quality grease as specified by the manufacture at least once every 6-9 months or as directed by the manufacture. T.E.F.C. air ventilation slots should be inspected and cleaned regularly to prevent clogging and starving the motor of cooling air. To maintain the electric motor properly see the manufactures requirements and specifications.

e) Fan blades should be cleaned and inspected for tightness during the regular maintenance schedule when handling a fan blade care must be given to avoid bending or striking any of the blades. Fan blades are factory balanced and will not operate properly if damaged or unbalanced. Damaged fan blades can cause excessive vibration and severe damage to the heat exchanger or drive motor.

Replace any damaged fan with an American industrial suggested replacement.

f) ACA heat exchanger cabinets are constructed using 7ga. through 18ga. steel that may be bent back into position if damaged. Parts that are not repairable can be purchased through American Industrial.

g) Coil fins that become flattened can be combed back into position. This process may require removal of the coil from the cabinet.

h) It is not advisable to attempt repairs to brazed joints of a brazed construction coil unless it will be done by an expert in silver solder brazing. Brazed coils are heated uniformly during the original manufacturing process to prevent weak zones from occurring. Uncontrolled reheating of the coil may result in weakening of the tube joints surrounding the repair area. In many instances brazed units that are repaired will not hold up as well to the rigors of the system as will a new coil. American Industrial will not warranty or be responsible for any repairs done by unauthorized sources. Manipulation in any way other than normal application will void the manufactures warranty.

i) Units containing a Serviceable Core® have bolted manifold covers that can be removed for cleaning or repair purposes.

Servicing Sequence

American Industrial has gone to great lengths to provide components that are repairable. If the ACA unit requires internal cleaning or attention the following steps will explain what must be done to access the internal tubes. Be sure to order gasket kits or repair parts prior to removal and disassembly to minimize down time.

a) To clean the internal tubes first remove all connection pipes from the unit.

b) Be sure the unit is drained of all water etc...

c) Place the ACA unit in an area that it can be accessed from all sides.

d) Remove the manifold cover bolts and hardware and place them into a secure place.

e) The manifold covers are tightly compressed and may need some prying to separate them from the gasket, physically remove the cover assemblies from both sides.

f) The tubes are now accessible for cleaning. We suggest a mild water-soluble degreaser be used with a brush. Tubing I.D. is .325 a plastic bristle brush on a rod will work best for cleaning the tubes. Steel brushes should be avoided since the steel is harder than the copper tubing and may heavily score the tubes if used.

g) If there are any leaking tubes you may plug them be forcing a soft metal plug into the hole and tapping it tight. You may in some cases weld the leaking tube shut however, care should be taken since excessive heat may cause surrounding tube joints to loosen and leak.

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DT4.10—4.40 Series

ISO 9001 Certified
CE Compliant

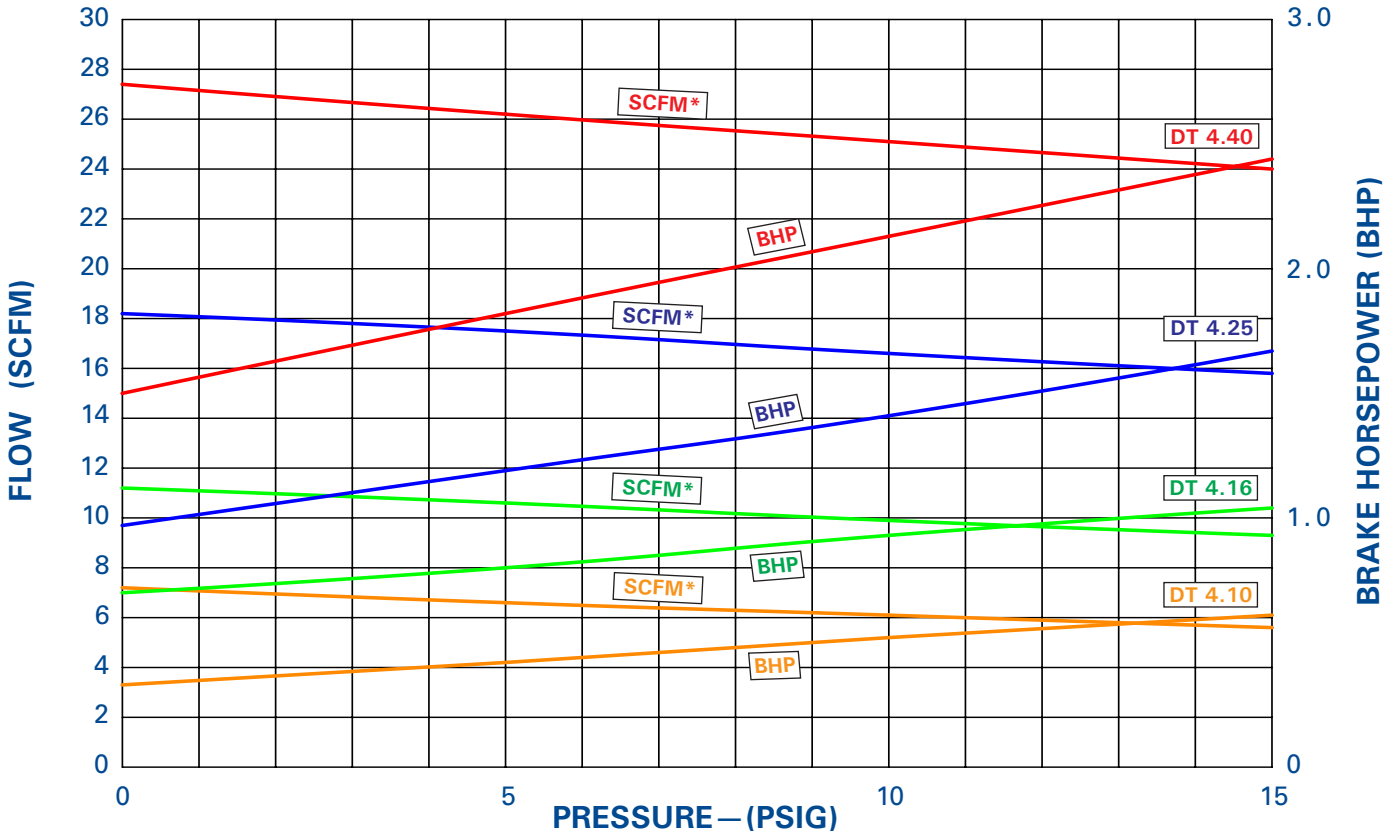
100% OIL-LESS COMPRESSORS

The Becker DT4.10—4.40 Series compressors are 100% oil-less rotary vane compressors. They are designed to operate on a continuous basis at any point from atmospheric pressure to a pressure of 15 PSIG.

The DT series compressors are direct drive units and are supplied with a TEFC flange mounted electric motor. Each pump is equipped with an integral pressure relief valve, a 10µ inlet filter, and vibration isolators as standard equipment.

Becker DT series compressors have a reputation for being exceptionally quiet. These newly redesigned pumps are even quieter, and operate cooler than previous units. If you are an OEM, their attractive styling will never cause embarrassment when included with your product.

These 100% oil-less, or dry, non-polluting compressors are ideal for applications where oil or water is objectionable. All Becker DT series compressors use long-life, self-lubricating graphite composite vanes. Vacuum, and combination pressure/vacuum models are also available.



* @ 29.92" Hg Bar. Pr.; 68°F; 36% R.H.; 0.075#/ft³

COMBINED FLUID PRODUCTS COMPANY • ***Vacuum and Compressed Air Specialists*** • **Since 1975**
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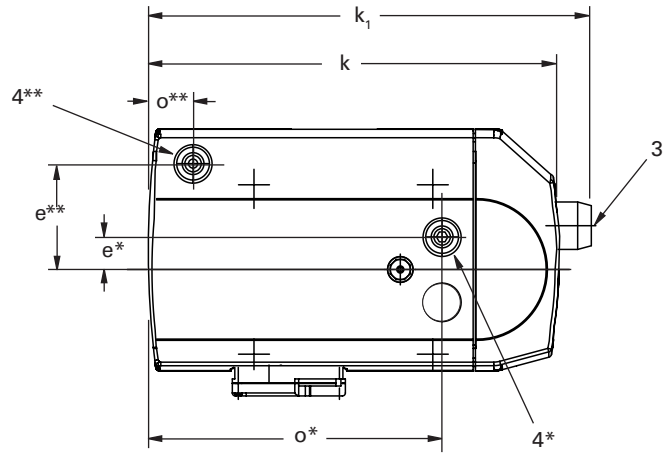
BECKER

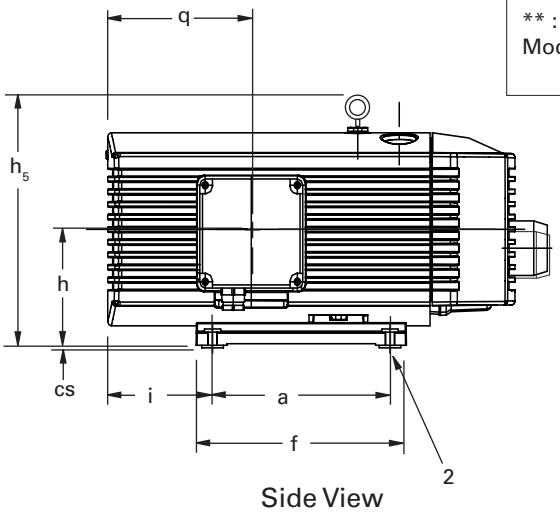
TECHNICAL DATA



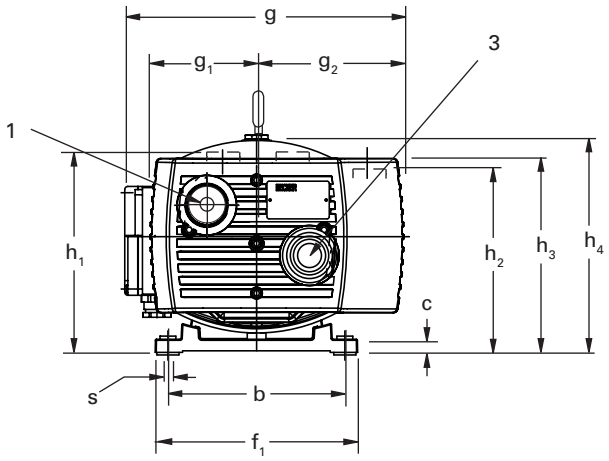
Top View

* :
Models DT4.10
& DT4.16

** :
Models DT4.25
& DT4.40



Side View



End View (Opposite Motor End)

All data based on 60 Hz operation	DT 4.10	DT 4.16	DT 4.25	DT 4.40
Flow (SCFM @ 0 PSIG)	7.2	11.2	18.2	27.4
Horsepower	0.6	0.94	1.75	2.9
Speed (RPM)	1740	1740	1740	1740
Max. Oper. Pressure	15	15	15	15
(PSIG)	35.2	51.7	80.3	101
Weight (lbs.)—w/ motor	62	64	68	70
Noise Level (Max. dBA)	½	½	¾	¾
Outlet size (BSP, inches)	(Inches)			
Dimensional Data	6.3	7.95	8.66	8.66
a	4.41	4.92	7.48	8.19
b	0.6	0.6	0.6	0.6
c	0.12	0.12	0.12	0.12
cs	1.38	1.38	5.12	5.12
e	7.88	9.53	10.24	10.24
f	5.6	6.1	9.37	9.37
f_1	8.11	9.1	12.92	12.92
g	3.54	4.03	4.92	4.92
g_1	3.54	4.03	6.81	6.81
g_2	4.21	4.45	5.51	5.51
h	6.66	7.4	—	—
h_1	—	—	8.43	8.43
h_2	6.93	7.32	8.9	8.9
h_3	7.44	8.07	9.84	9.84
h_4	7.68	8.3	11.42	11.42
h_5	4.17	2.88	4.45	7.0
i	15.25	16.38	19.89	23.04
k	16.9	17.8	21.46	24.61
k_1	10.12	11.48	2.16	2.16
o	4.84	5.97	6.81	7.56
q	0.27	0.27	0.27	0.27
s				

Manufacturer reserves right to alter data without notice.

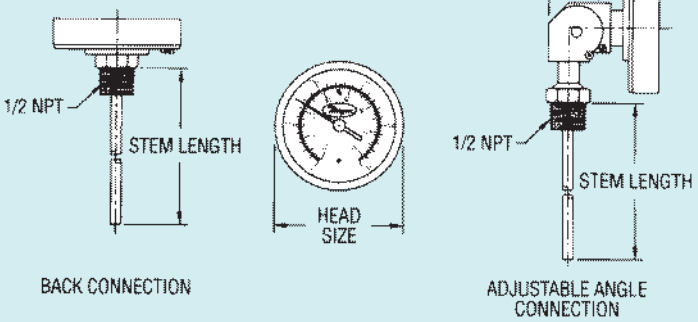
1 - Inlet
2 - Vibration Isolator
3 - Pressure Regulating Valve
4 - Discharge Port

3LIT0026 • 11/03

Series BT

Bimetal Thermometers

2″, 3″ or 5″ Dial, Dual Scale, ±1% FS Accuracy, External Reset



Series BT Bimetal Thermometers offer accurate, reliable service even in the toughest environments. These corrosion resistant units are constructed from stainless steel and are hermetically sealed to prevent crystal fogging. The bimetal element directly drives pointer, eliminating gears and linkage. An external reset screw allows field calibration and easy-to-read aluminum dial minimizes parallax error. Choose back connection, lower connection or adjustable angle for easy viewing and installation. Adjustable models can be rotated a full 360° and tilted over a 180° arc. NOTE: When using in pressurized applications, use a suitable thermowell. Bimetal thermometers are commonly used to measure water temperature on chillers and boilers.

SPECIFICATIONS
Wetted Materials: ##
Housing Material: #+6/+7 ##
Lens: 1(77
Accuracy: A ,911 7)(1+
Response Time: B 7+)43*7
Temperature Limits: +(* ? ? #8+2 48 84 +<)++*
4:+6 6(3-+ 46 ? ? 46 ? ?
)438/394971=
Process Connection: C !$ 43 C */(1 7/>+ C !$ 43 C
46 C */(1 7/>+
Stem Diameter: C
Immersion Depth: /3/292 C /3 1/59/*7 C /3 -(7

Model	Dial Size, Stem Length	Temperature Range, °F(°C)	Degree Div., °F(°C)
Back Connection			
BTB22551*	C C		
BTB2405D	C C		
BTB2409D	C C		
BTB32510D	C C		
BTB3255D	C C		
BTB3257D	C C		
BTB34010D	C C		
BTB3405D	C C		
BTB3407D	C C		
BTB3605D	C C		

Model	Dial Size, Stem Length	Temperature Range, °F(°C)	Degree Div., °F(°C)
Adjustable Angle Connection			
BTA54010D	C C		
BTA5405D	C C		
BTA5407D	C C		
BTA56010D	C C		
BTA5605D	C C		
BTA5607D	C C		
Lower Connection			
BTC3255D	C C		

4*+1 4,,+6+* /3 (.6+3.+/8 7)(1+ 431=

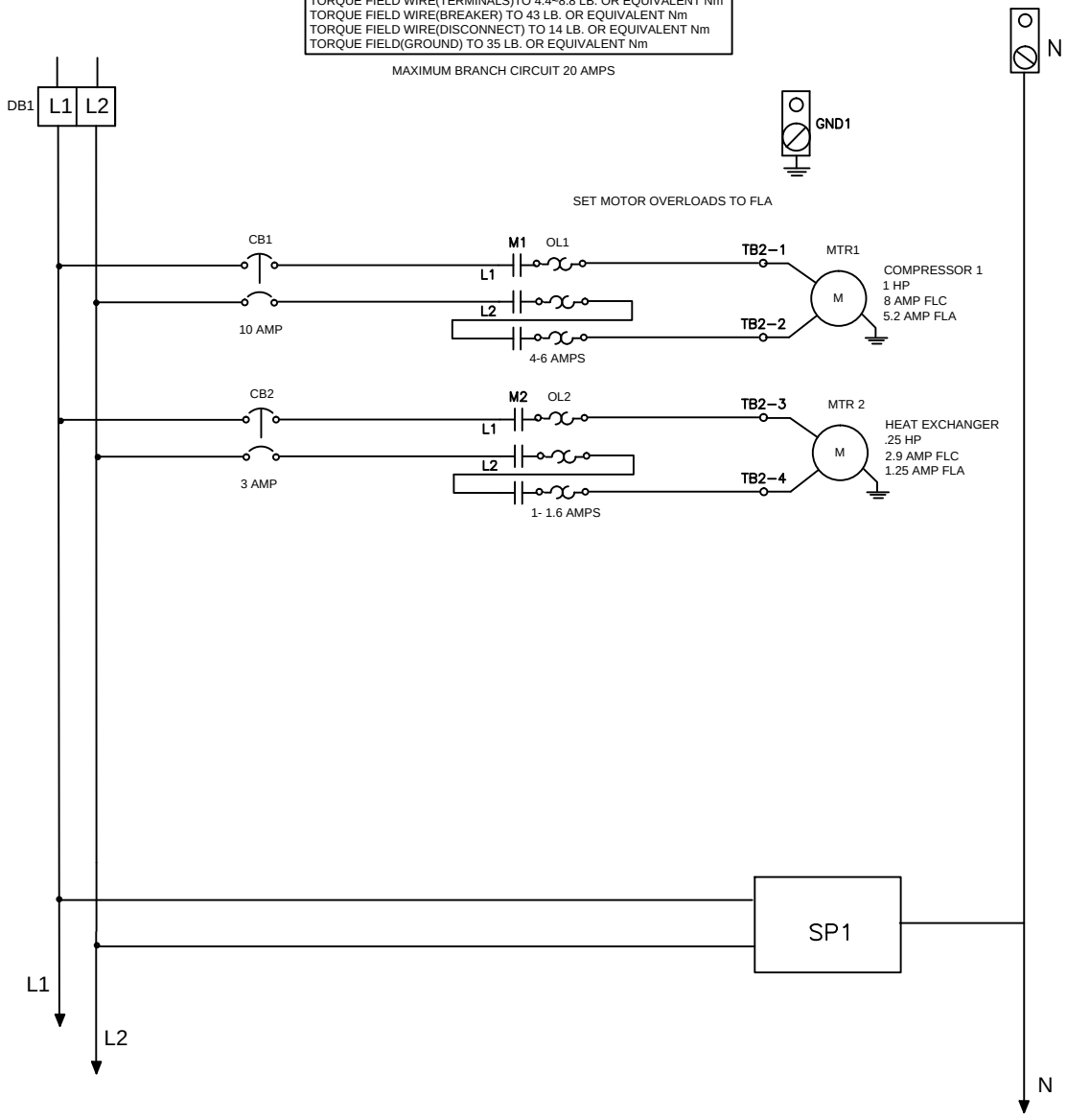
OVERCURRENT AND SERVICE DISCONNECT BY OTHERS

ENVIRO-EQUIPMENT

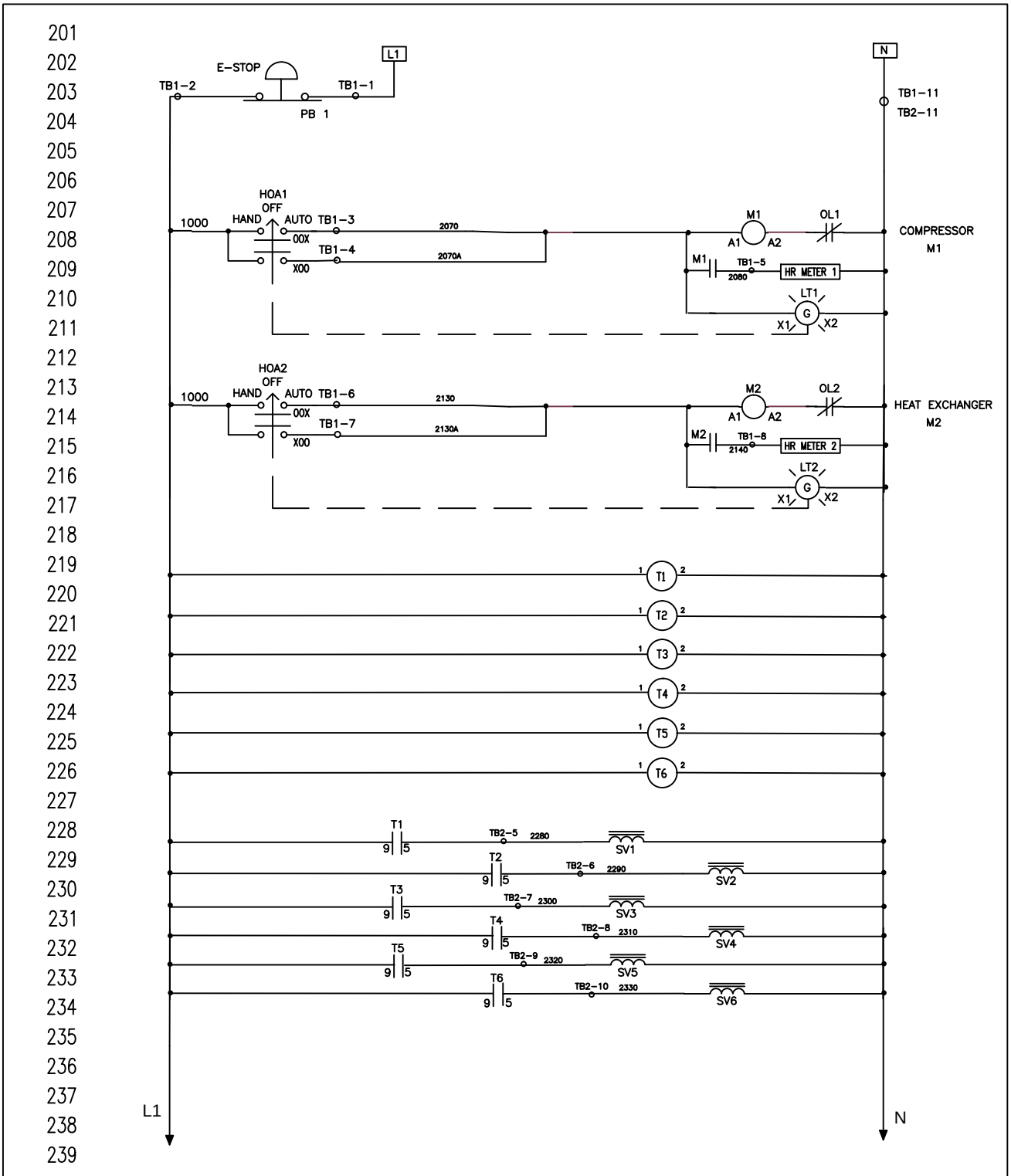
230 VAC 15 AMP 1-PHASE 3 WIRE 60 HZ

FIELD WIRING SHALL BE LISTED 60 DEG. C COPPER WIRE FOR TERMINALS RATED LESS THAN 100.
TORQUE FIELD WIRE (I/S TERMINALS)TO 20. OR EQUIVALENT Nm
TORQUE FIELD WIRE(TERMINALS)TO 4.4~8.8 LB. OR EQUIVALENT Nm
TORQUE FIELD WIRE(BREAKER) TO 43 LB. OR EQUIVALENT Nm
TORQUE FIELD WIRE(DISCONNECT) TO 14 LB. OR EQUIVALENT Nm
TORQUE FIELD(GROUND) TO 35 LB. OR EQUIVALENT Nm

MAXIMUM BRANCH CIRCUIT 20 AMPS



	DATE	NAME			
DRAWN BY	07-10-14	CKR	ENVIRO-EQUIPMENT 10120 Industrial Drive Pineville, NC 28134 704-556-7723	PROJECT: 2951	DRAWING-NO.: EEI2951 JOB-NO.:
CKD BY				PAGE DESCRIPTION: MAIN CONTROL PANEL	PAGE: 1 OF 2



	DATE	NAME	ENVIRO-EQUIPMENT	PROJECT:	DRAWING-NO.:
DRAWN BY	07-10-14	CKR	10120 Industrial Drive Pineville, NC 28134 704-556-7723	2951	EEI2951
CKD BY					JOB-NO.:
				PAGE DESCRIPTION: MAIN CONTROL PANEL	PAGE: 2 OF 2

Installation & Maintenance Instructions

2–WAY INTERNAL PILOT–OPERATED SOLENOID VALVES
PISTON TYPE — 3/8 AND 1/2 NPT
NORMALLY CLOSED OPERATION

BULLETINS
8210
8211

Form No.V5310R3

DESCRIPTION

Bulletin 8210 valves are 2-way normally closed internal pilot operated solenoid valves. Valves have a 'Y' type body of brass or stainless steel construction. Standard valves have a General Purpose NEMA Type 1 Solenoid Enclosure.

Bulletin 8211's are the same as Bulletin 8210's except the solenoids are equipped with an enclosure which is designed to meet NEMA Type 4 - Watertight, NEMA Type 7 (C or D) Hazardous Locations - Class I, Group C or D and NEMA Type 9 (E, F or G) Hazardous Locations - Class II, Groups E, F or G. Installation and maintenance instructions for explosion-proof/watertight solenoid enclosures are shown on Form Nos. V-5380 and V-5391.

OPERATION

Normally Closed: Valve is closed when solenoid is de-energized. Valve opens when solenoid is energized.

MANUAL OPERATOR (Optional)

Valves with Suffix "MO" in the catalog number are provided with a manual operator which allows manual operation when desired or during an interruption of electrical power. To operate valve manually, turn stem 180°. Valve will be in the same position as when the solenoid is energized. Disengage manual operator by turning stem 180°. CAUTION: Stem must be returned to original (normally closed) position before operating valve electrically.

INSTALLATION

Check nameplate for correct catalog number, pressure, voltage and service.

TEMPERATURE LIMITATIONS

For maximum valve ambient and fluid temperatures, refer to chart. The temperature limitations listed are for UL applications. For non UL applications, higher ambient and fluid temperature limitations are available. Consult factory. Check catalog number on nameplate to determine maximum temperatures.

Construction	Coil Class	Catalog Number Prefix	Maximum Ambient Temp. °F	Maximum Fluid Temp. °F
A-C Construction (Alternating Current)	A	None	77	180
	F	FT	122	180
	H	HT	140	180
D-C Construction (Direct Current)	A, F or H	None, FT or HT	77	150

POSITIONING/MOUNTING

This valve is designed to perform properly when mounted in any position. However, for optimum life and performance, the solenoid should be mounted vertical and upright so as to reduce the possibility of foreign matter accumulating in the core tube area. For mounting bracket (optional feature) dimensions, refer to Figure 1.

PIPING

Connect piping to valve according to markings on valve body. Apply pipe compound sparingly to male pipe threads only; if applied to valve threads, it may enter the valve and cause operational difficulty. Pipe strain should be avoided by proper support and alignment of piping. When tightening pipe, do not use valve as a lever. Wrenches applied to valve body or piping are to be located as close as possible to connection point.

IMPORTANT: For the protection of the solenoid valve, install a strainer or filter suitable for the service involved in the inlet side as close to the valve as possible. Periodic cleaning is required depending on the service conditions. See Bulletins 8600, 8601 and 8602 for strainers.

WIRING

Wiring must comply with Local and National Electrical Codes. Housings for all solenoids are provided with connections for 1/2 inch conduit. Solenoid enclosure may be rotated to facilitate wiring by removing the retaining cap or clip. CAUTION: When metal retaining clip disengages, it will spring upward. Rotate enclosure to desired position. Replace retaining cap or clip before operating.

NOTE: Alternating Current (A-C) and Direct Current (D-C) solenoids are built differently. To convert from one to the other, it is necessary to change the complete solenoid including the solenoid base sub-assembly and core assembly.

SOLENOID TEMPERATURE

Standard catalog valves are supplied with coils designed for continuous duty service. When the solenoid is energized for a long period, the solenoid enclosure becomes hot and can be touched with the hand only for an instant. This is a safe operating temperature. Any excessive heating will be indicated by the smoke and odor of burning coil insulation.

MAINTENANCE

WARNING: Turn off electrical power supply and depressurize valve before making repairs. It is not necessary to remove the valve from the pipe line for repairs.

CLEANING

A periodic cleaning of all solenoid valves is desirable. The time between cleanings will vary, depending on media and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive leakage or noise will indicate that cleaning is required. Be sure to clean valve strainer or filter when cleaning solenoid valve.

PREVENTIVE MAINTENANCE

1. Keep the medium flowing through the valve as free from dirt and foreign material as possible.
2. While in service, operate the valve at least once a month to insure proper opening and closing.
3. Periodic inspection (depending on media and service conditions) of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace any parts that are worn or damaged.

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50 Hanover Road, Florham Park, New Jersey 07932 www.ascovalve.com

IMPROPER OPERATION

1. **Faulty Control Circuit:** Check the electrical system by energizing the solenoid. A metallic click signifies that the solenoid is operating. Absence of the click indicates loss of power supply. Check for loose or blown-out fuses, open circuited or grounded coil, broken lead wires or spliced connections.
2. **Burned-Out Coil:** Check for open-circuited coil. Replace coil if necessary.
3. **Low Voltage:** Check voltage across the coil leads. Voltage must be at least 85% of nameplate rating.
4. **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within range specified on nameplate.
5. **Excessive Leakage:** Disassemble valve and clean all parts. Replace worn or damaged parts with a complete Spare Parts Kit for best results.

COIL REPLACEMENT (Refer to Figures 1 and 2)

Turn off electrical power supply and disconnect coil lead wires. Proceed in the following manner:

1. Remove retaining cap or clip, nameplate and cover (housing on D-C Construction). CAUTION: When metal retaining clip disengages, it will spring upward.
2. For A-C Construction, slip yoke containing coil, sleeves and insulating washers off the solenoid base sub-assembly. For D-C Construction, slip spring washer, coil and insulating washers off the solenoid base sub-assembly. Insulating washers are omitted when a molded coil is used.
3. Reassemble in reverse order of disassembly paying careful attention to exploded views provided for identification and placement of parts.

CAUTION: Solenoid must be fully reassembled as the housing and internal parts are part of and complete the magnetic circuit. Place insulating washer at each end of coil, if required.

VALVE DISASSEMBLY

Depressurize valve and turn off electrical power supply. For A-C Construction, refer to Figure 1. For D-C Construction, refer to Figure 2. Proceed in the following manner:

1. Disassemble valve in an orderly fashion paying careful attention to exploded views provided for identification of parts.
2. Remove retaining cap or clip and slip the entire solenoid enclosure off the solenoid base sub-assembly. CAUTION: When metal retaining clip disengages, it will spring upward. For A-C Construction, remove fluxplate from solenoid base sub-assembly.
3. Unscrew solenoid base sub-assembly.
4. Remove core assembly, core spring, body gasket and piston assembly with piston ring attached.
5. For normal maintenance, it is not necessary to disassemble the manual operator unless external leakage is evident. To disassemble, remove stem pin, manual operator stem with stem gasket attached.
6. All parts are now accessible for cleaning or replacement. Replace worn or damaged parts with a complete Spare Parts Kit for best results.

VALVE REASSEMBLY

1. Reassemble in reverse order of disassembly paying careful attention to exploded views provided for identification and placement of parts.
2. Replace piston assembly, body gasket, core assembly and core spring. Wide end of core spring goes in the core first, closed end protrudes from the top of the core.
3. Replace solenoid base sub-assembly and torque to 175 ± 25 inch pounds.
4. If removed, replace stem gasket, manual operator stem and stem pin.
5. Replace solenoid enclosure and retaining cap or clip.
6. After maintenance, oparate the valve a few times to be sure of proper opening and closing.

SPARE PARTS KITS

Spare Parts Kits and Coils are available for ASCO valves.
Parts marked with an asterisk (*) are supplied in Spare Parts Kits.

ORDERING INFORMATION FOR SPARE PARTS KITS
When Ordering Spare Parts or Coils Specify Valve Catalog Number, Serial Number and Voltage.

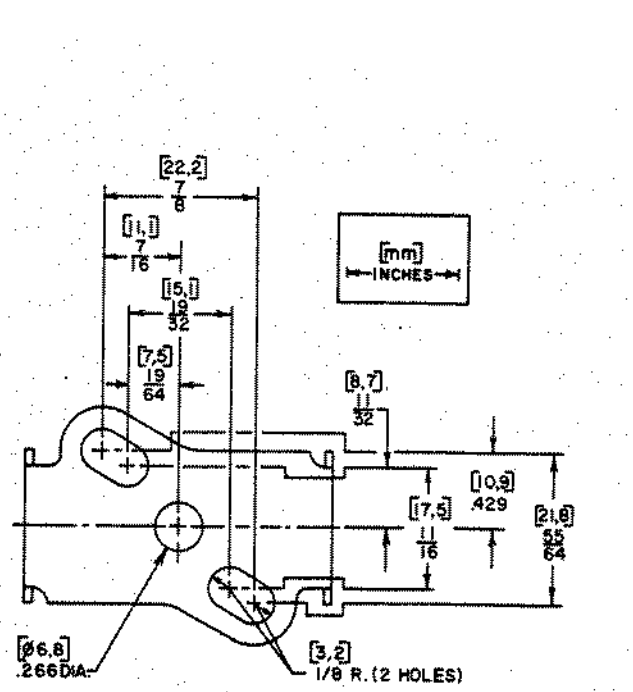

Figure 1. **Dimensions For Mounting Bracket (Optional Feature)**

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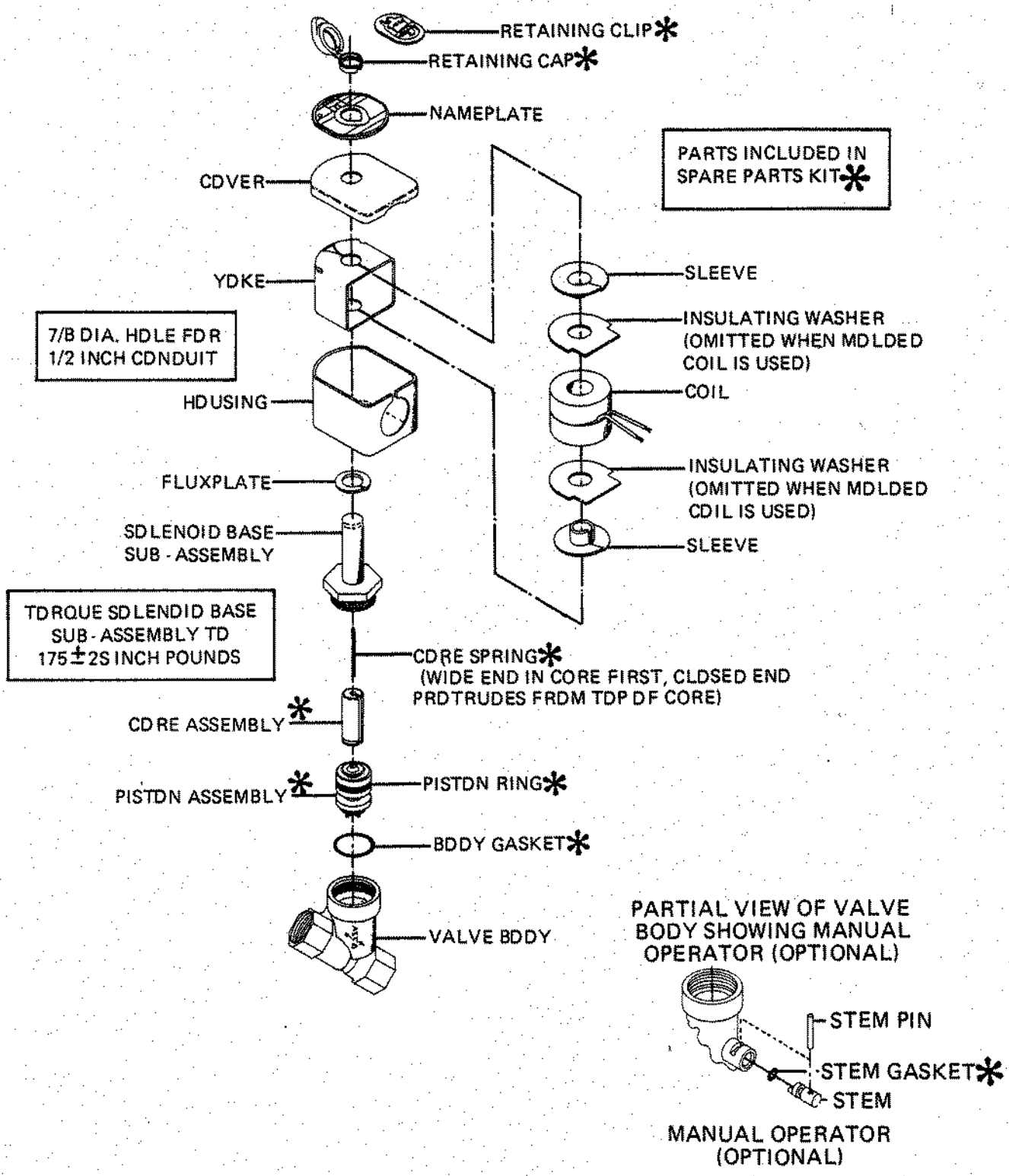

Bulletin 8210 — A-C Construction
General Purpose Solenoid Enclosure Shown.
For Explosion-Proof/Watertight Solenoid Enclosure used on Bulletin 8211, see Form No. V-5391.

Figure 2.

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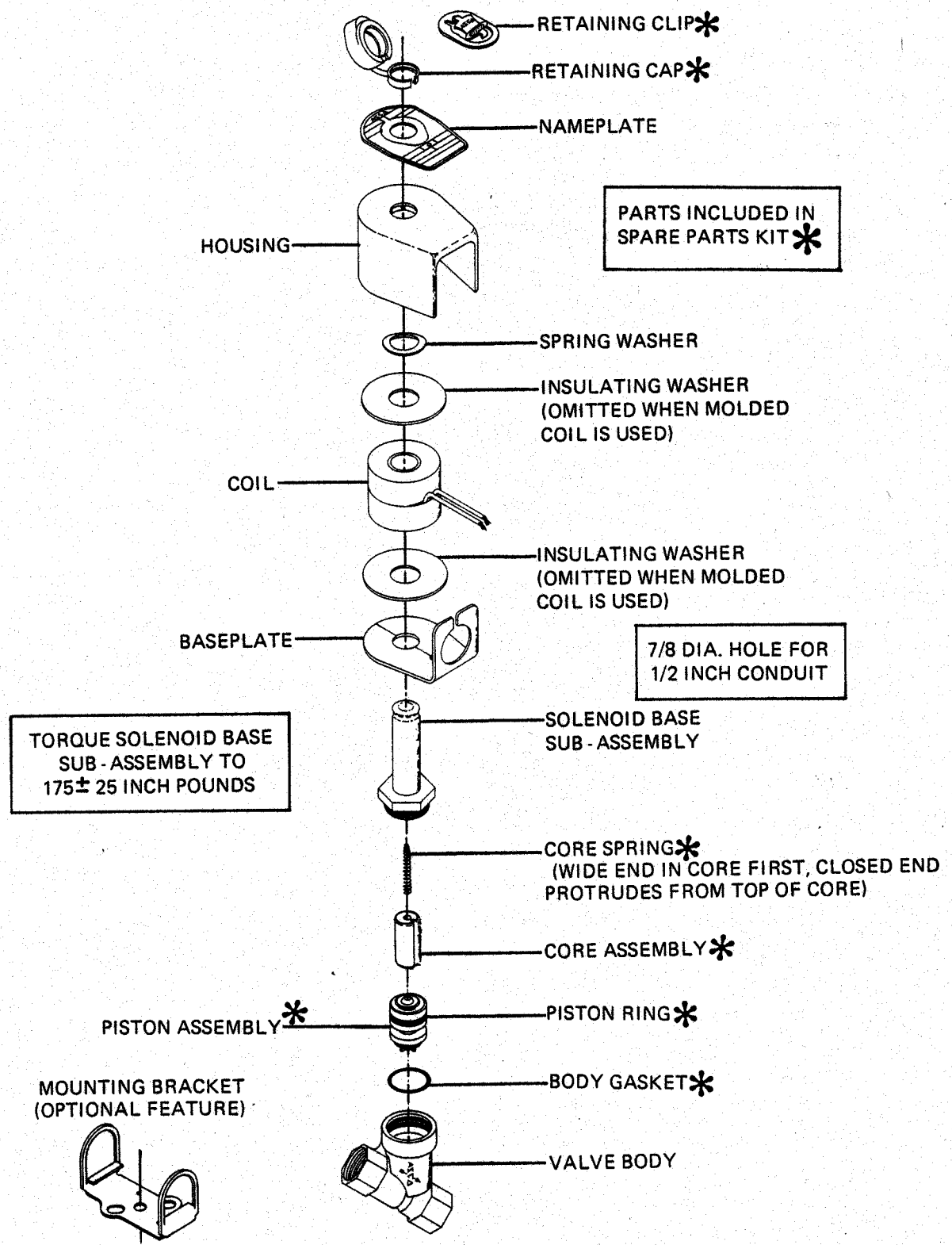

Bulletin 8210 — D-C Construction
General Purpose Solenoid Enclosure Shown.
For Explosion-Proof/Watertight Solenoid Enclosure used on Bulletin 8211, see Form No. V-5380.

Figure 3.

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Series RM Rate-Master® Flowmeters

Specifications - Installation and Operating Instructions

Fig. 1

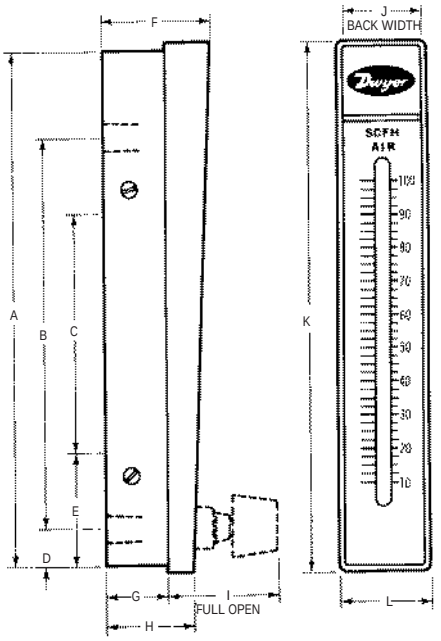

Fig. 2

Dimensions in Inches (Centimeters)			
	Model RMA	**Model RMB**	**Model RMC**
A	4 -9/16 (11.59)	8-1/2 (21.59)	15 -1/8 (38.42)
B	3 (7.62) 1/8 NPT CONN.	6-7/16 (16.35) 1/4 NPT CONN.	12 -1/4 (31.12) 1/2 NPT CONN.
C	1-5/8 (4.13) 10 - 32 Thds.	3-15/16 (10.00) 1/4 - 20 Thds.	8-3/4 (22.23) 10 - 32 Thds.
D	3/8 (.95)	5/8 (1.59)	1 (2.54)
E	1-1/16 (2.70)	1-7/8 (4.76)	2-3/4 (6.99)
F	1-3/16 (3.02)	1-3/4 (4.45)	2-1/2 (6.35)
G	11/16 (1.75)	1 (2.54)	1-7/16 (3.65)
H	61/64 (2.42)	1-7/16 (3.65)	1-31/32 (5.00)
I (OPEN)	1-3/8 (3.49)	1-13/16 (4.60)	2-1/2 (6.35)
J	3/4 (1.91)	1-1/4 (3.18)	2 (5.08)
K	4-13/16 (12.22)	8-3/4 (22.23)	15-3/8 (39.05)
L	1 (2.54)	1-1/2 (3.81)	2-1/4 (5.72)

Panel Cutout For Flush Mounting			
High	4-5/8 (11.75)	8-9/16 (21.75)	15 -3/16 (38.58)
Wide	7/8 (2.22)	1-5/16 (3.33)	2-1/16 (5.24)
Panel Hole Sizes for Surface Mounting			
Pipe	7/16 (1.11)	5/8 (1.59)	15/16 (2.38)
Bolt	1/4 (0.64)	9/32 (0.71)	13/32 (1.03)

The Series RM Rate-Master® Flowmeters are furnished in three models (see Fig. 2), each available in a broad array of flow ranges with direct reading scales for air, gas or water. Installation, operation and maintenance are very simple. Only a few common-sense precautions must be observed to assure long, trouble-free service.

CAUTION: Rate-Master® Flowmeters are designed to provide satisfactory long-term service when used with air, water or other compatible media. Refer to factory for information on questionable gases or liquids. Avoid solutions of acids, bases or salts having a pH below 5.0 or above 8.5. Caustic solutions, antifreeze (ethylene glycol) and aromatic solvents should definitely not be used.

Calibration

Each Rate-Master® Flowmeter is calibrated at the factory. If at any time during the meter's life, you wish to re-check its calibration, do so only with devices of certified accuracy. DO NOT attempt to check a Rate-Master® Flowmeter with a similar flowmeter, as seemingly unimportant variations in piping and back pressure may cause noticeable differences in the indicated reading. If in doubt, return your Rate-Master® Flowmeter to the factory. Its calibration will be checked for you at no charge. Before proceeding with installation, check to be sure you have the Rate-Master® flowmeter model and flow range you require.

LOCATION: Temperature, Pressure, Atmosphere and Vibration: Rate-Master® Flowmeters are exceptionally tough and strong. They are designed for use at pressures up to 100 psi (6.89 bar) and temperatures up to 130°F (54°C).

DO NOT EXCEED THESE LIMITS! The installation should not be exposed to strong chlorine atmospheres or solvents such as benzene, acetone, carbon tetrachloride, etc. The mounting panel should be free of excessive vibration, as it may prevent the unit from operating properly.

Inlet Piping Run: It is good practice to approach the flowmeter inlet with as few elbows and restrictions as possible. In every case, the inlet piping should be at least as large as the connection to the flowmeter; i.e.,1/8˝ Iron Pipe Size for RMA models 1/4˝ IPS for RMB models,1/2˝ IPS for RMC models. Length of inlet piping makes little difference for normal pressure-fed flowmeters.

For flowmeters on vacuum air service, the inlet piping should be as short and open as possible. This will allow operation near atmospheric pressure and thereby insure the accuracy of the device. (**Note:** for vacuum air service, the flow control valve, if any, should be on the discharge side of the flowmeter. Either the TMV unit or a separate in-line valve may be applied.).

Discharge Piping: As on the inlet, discharge piping should be at least as large as the flowmeter connection. Also, for pressure-fed flowmeters on air or gas service, the discharge piping should be as short and open as possible. This will allow operation of the flow tube at near atmospheric pressure and insure the accuracy of the device. This is of less importance on water or liquid flowmeters, as the flowing medium is generally incompressible and moderate back pressure will not affect the accuracy of the instrument as calibrated.

POSITIONING AND MOUNTING

All Rate-Master® Flowmeters must be mounted in a vertical position with inlet connection at the bottom rear and outlet at the top rear.

Bezel or Through-Panel Mounting: Make panel cutout using appropriate dimensions from Fig. 2. Flowmeter must fit into panel freely without forcing or squeezing. Insert the flowmeter from the front of the panel and install the mounting clamps from the rear. Insert and tighten the clamp bolts in the locations shown in Fig. 3. Do not exceed 5 in./lbs. Make connections to inlet and outlet ports using pipe thread sealant tape to avoid leakage. Avoid excess torque, which may damage the flowmeter body.

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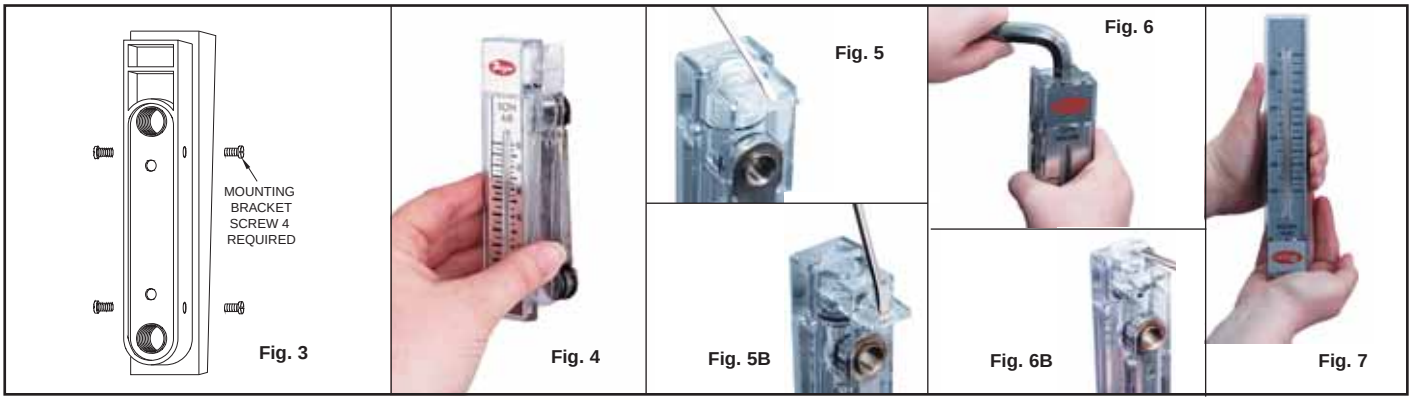


Surface Mounting: Drill appropriate holes in panel, using the dimensions shown in Fig. 2. Hold the flowmeter in position in front of the panel and install the clamp bolts from the rear. (The mounting clamps may be used as washers, if desired, by installing them backwards or straightening them out.) Pipe up inlet and discharge following the directions in the previous sections.

Surface Mounting on Piping Only: An alternate method of surface mounting, omitting the clamp bolts and supporting the flowmeter solely on the connecting piping, is possible. For this method, extra-long or straight pipe threads should be used so that nuts may be run onto the pipe and later tightened against the back of the panel to retain the unit in proper position. Use appropriate hole layout in formation from Fig. 2, but omit the small holes.

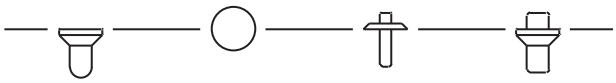
Surface Mounting on Piping Only Without Panel: For a temporary or laboratory type installation, the panel may be omitted altogether and the flowmeter installed directly in rigid piping. Its light weight permits this without difficulty.

OPERATION

To start system, open valve slowly to avoid possible damage. Control valves on BV and SSV models are turned clockwise to reduce flow, counter-clockwise to increase flow. A nylon insert is provided in the threaded section of the valve stem to give a firm touch to valve and to prevent change of setting due to vibration.

The performance of low range units used in air or gas applications may be affected by static electricity. Excessive static charge may cause the ball float to behave erratically or provide a false reading. To ensure the proper function of the unit, the application should be designed to minimize or dispel static electricity.

The standard technique for reading a Variable Area Flowmeter is to locate the highest point of greatest diameter on the float, and then align that with the theoretical center of the scale graduation. In the event that the float is not aligned with a grad, an extrapolation of the float location must be made by the operator as to its location between the two closest grads. The following are some sample floats shown with reference to the proper location to read the float.



Variable Area Flowmeters used for gases are typically labeled with the prefix “S” or “N”, which represents “Standard” for English units or “Normal” for metric units. Use of this prefix designates that the flowmeter is calibrated to operate at a specific set of conditions, and deviation from those standard conditions will require correction for the calibration to be valid. In practice, the reading taken from the flowmeter scale must be corrected back to standard conditions to be used with the scale units. The correct location to measure the actual pressure and temperature is at the exit of the flowmeter, except when using the Top Mounted Valve under vacuum applications, where they should be measured at the flowmeter inlet. The equation to correct for nonstandard operating conditions is as follows:

$$Q_2 = Q_1 \times \sqrt{\frac{P_1 \times T_2}{P_2 \times T_1}}$$

Where: Q_1 = Actual or Observed Flowmeter Reading
Q_2 = Standard Flow Corrected for Pressure and Temperature
P_1 = Actual Pressure (14.7 psia + Gage Pressure)
P_2 = Standard Pressure (14.7 psia, which is 0 psig)
T_1 = Actual Temperature (460 R + Temp °F)
T_2 = Standard Temperature (530 R, which is 70°F)

Example: A flowmeter with a scale of 10-100 SCFH Air. The float is sitting at the 60 grad on the flowmeter scale. Actual Pressure is measured at the exit of the meter as 5 psig. Actual Temperature is measured at the exit of the meter as 85°F.

$$Q_2 = 60.0 \times \sqrt{\frac{(14.7 + 5) \times 530}{14.7 \times (460 + 85)}}$$

Q_2 = 68.5 SCFH Air

CAUTION: Do not completely unscrew valve stem unless the flowmeter is unpressurized and drained of any liquid. Removal while in service will allow gas or liquid to flow out the front of the valve body and could result in serious personal injury. For applications involving high pressure and/or toxic gases or fluids, special non-removable valves are available on special order. Please contact factory for details.

MAINTENANCE

The only maintenance normally required is occasional cleaning to assure reliable operation and good float visibility.

Disassembly: The flowmeter can be disassembled for cleaning simply as follows:

1. Remove valve knob from RMB or RMC -BV or -SSV units by pulling the knob forward. It is retained by spring pressure on the stem half-shaft so that a gentle pull will remove it. On RMA-BV or -SSV models, turn the valve knob counter-clockwise until the threads are disengaged. Then withdraw the stem from the valve by gently pulling on the knob.

2. Remove the four mounting bracket screws located in the sides of the flowmeter. See Fig. 3. Pull the flowmeter body gently forward away from the back plate to avoid undue strain on the body. Leave the piping connections intact. There is no need to disturb them. See Fig. 4.

3. Threaded body style flowmeters - Remove the slip cap with a push on a screwdriver as shown in Fig. 5. Remove the plug ball stop as shown in Fig. 6 using allen wrench sizes as follows: Model RMA - 1/4˝, Model RMB - 1/2˝ and Model RMC - 3/4˝ Threadless body style flowmeters - Release the plastic retaining clip with a screw driver (Figure 5B), it will unclip from the valve body (TMV Option) or the plug ball stop, slide the clip back until the valve body or ball stop can be removed. The clip will remain in the body for convenience. Using a screwdriver gently lift up on the plug in the groove as shown in Figure 6B until the o-ring seal is released and remove the plug. For the TMV option gently pull up on the valve knob to release the valve body seals and remove the valve.

4. Take out the ball or float by inverting the body and allowing the float to fall into your hand, as shown in Fig. 7. (Note: It is best to cover the discharge port to avoid losing the float through that opening.)

Cleaning: The flow tube and flowmeter body can best be cleaned with a little pure soap and water. Use of a bottle brush or other soft brush will aid the cleaning. Avoid benzene, acetone, carbon tetrachloride, alkaline detergents, caustic soda, liquid soaps (which may contain chlorinated solvents), etc. Also, avoid prolonged immersion, which may harm or loosen the scale.

Reassembly: Simply reverse steps 1 through 4 and place the flowmeter back in service. A little stopcock grease or petroleum jelly on the “O” rings will help maintain a good seal as well as facilitate assembly. No other special care is required.

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Operating Instructions

INTERMATIC®

FM/1 Series
Time Switches

TECHNICAL DATA

Supply Voltage:	Synchronous: 24, 120 and 240VAC, 60Hz Quartz: 24V AC/DC, 120 and 240VAC 50/60 Hz
Switch Type:	SPDT
Switch Rating:	21A @ 250VAC resistive 1350 watt tungsten 1HP @ 125VAC 2HP @ 240VAC
Ambient Temp. Range:	–40°F to 180°F, synchronous units –20°F to 140°F, quartz units
Terminals:	1/4" spade terminals
Reserve Carryover:	7 days for quartz units
Weight:	Approximately 3 oz.
Agency Approvals:	UL Recognized

NOTE: 24V quartz unit will operate on 6VDC, 12VDC, or 24VDC

APPLICATIONS

The FM/1 series of time switches are designed for control of heating, ventilating, air conditioning, refrigeration, lighting, security, circulating pumps, spas or any electrical load requiring 24-hour or 7-day scheduling.

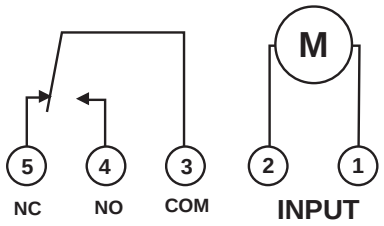
WIRING

Verify input voltage stated on back of unit. Use 1/4" quick connects and make connections in accordance with the wiring diagram shown and applicable code requirements. When using 24V units, it is important to use transformers that will supply the required 24 volts AC to terminals 1 & 2.

Terminal Connections

Contacts shown in "Off" position (trippers pushed inward)

"On" position (trippers pushed outward) will close contacts 3 & 4

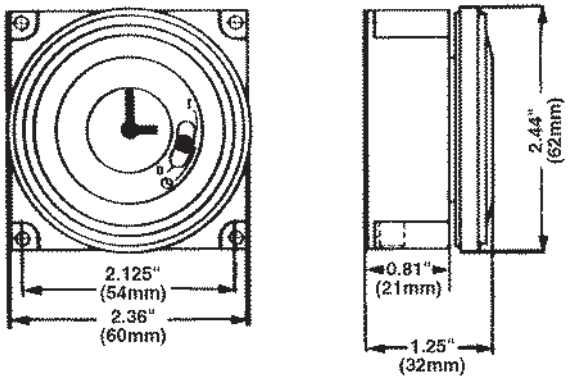


MOUNTING

The standard FM/1 units can be flush mounted (mounting kit with screws available) or surface mounted inside a panel. A printed circuit board mounting base is also available. An indoor or outdoor enclosure is available for stand-alone mounting. In addition, unit is also available in DIN housing for flush or surface mounting (see MIL72, Digi 20 or Digi 42 data sheets). Optional clear plastic dust cover is available.

Dimensions

FM/1 synchronous/quartz



TIME SETTING

TO SET THE CURRENT TIME (AND DAY OF WEEK ON 7 DAY UNITS), TURN THE MINUTE HAND CLOCKWISE. DO NOT SET THE TIME BY ROTATING "OUTER" DIAL.

Turn the minute hand clockwise until the day of the week (7-day timer) and the time of day on the outer dial is aligned with the triangle marker on the inner dial (two o'clock position).

Example for 7-day program dial Monday 10:30 AM. Turn the minute hand clockwise until Monday 10:30 AM is aligned with the triangle on the inner dial. The hour and minute hand will show exactly 10:30.

Example for 24-hour program dial 10:30 AM. Turn the minute hand clockwise until 10:30 AM is aligned with the triangle on the inner dial. The hour and the minute dial will show exactly 10:30.

PROGRAMMING

7-Day (SW, QRW Models)

The weekly program dial reflects the seven days of the week and AM/PM imprints for each day.

The time switch is programmed by pushing the captive trippers to the outer ring position for the entire period that the load is to be turned "ON", i.e., two hours for each tripper on the 7-Day dial. When the tripper is pushed to the inside, the switch is in the "OFF" position.

24-Hour (ST, QRT Models)

The 24-Hour dial has quarter-hour divisions and AM/PM indications.

The time switch is programmed by pushing the captive trippers to the outer ring position for the entire period that the load is to be turned "ON", i.e., fifteen minutes for each tripper on the 24-Hour dial. When the tripper is pushed to the inside, the switch is in the "OFF" position.

PROGRAMMING WITH MANUAL OVERRIDE SWITCH

AUTOMATIC MODE

In order to operate the time switch module in the automatic mode, the manual switch must be in the center position (automatic) - see diagram.

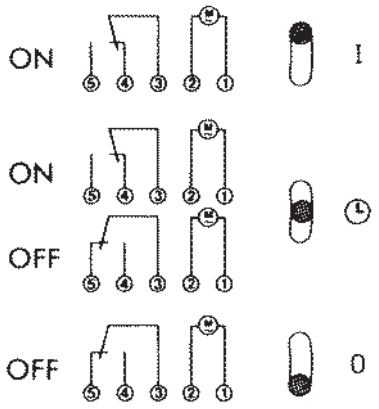
MANUAL MODE

With the manual switch selector lever the selected programs can be overridden. In the lower position, marked "O", terminals 3 and 5 are permanently closed. In the upper position, marked "I", terminals 3 and 4 are permanently closed (see diagram).

Override Mode

3-way manual override switch

I = permanent ON
◷ = automatic
0 = permanent OFF



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VACUUM AND PRESSURE LIQUID FILLED GAUGES
Back Mount

U Clamp

Standard

Flange Mount

- Suitable for Air, Water, Oil & Gas
- Dual Scale PSI/Kpa
- Stainless Steel Case & Bezel
- Brass Internals & NPT Connection
- Phosphor Bronze Bourdon Tube
- Accuracy 1-1/2" - 2-1/2": 3-2/3% 4":1%
- Ambient Temperature -30 F to 160˚F
- Liquid Filled Helps Dampen Effects of Pulsation and Vibration
- Liquid Filled Lubricates the Gauge Movement Keeping the Contaminates (Dirt) Away, Extending the Life of the Gauge
- ANSE 40.1 Compliant
- Connection: 1/8" NPT 1-1/2" Dial
  1/4" NPT 2" & Above

Part No.	Dial Size (In)	Pressure Range Code
Back Mount Pressure Gauges		
LFSB15-PSI	1-1/2	2
LFSB20-PSI	2	3
LFSB25-PSI	2-1/2	4
LFSB25-PSI	2-1/2	6
LFSB40-PSI	4	5
LFSB40-PSI	4	6
Back Mount U-Clamp Pressure Gauges		
LFSB25-PSI-U	2-1/2	4
LFSB25-PSI-U	2-1/2	6
LFSB40-PSI-U	4	5
LFSB40-PSI-U	4	6
Back Mount Flange Pressure Gauges		
LFSB25-PSI-F	2-1/2	4
LFSB25-PSI-F	2-1/2	6
LFSB40-PSI-F	4	5

LFSB40-PSI-F	4	6
Back Mounted Vacuum Gauges		
VFSB15-030	1-1/2	7
VFSB20-030	2	7
VFSB25-030	2-1/2	7
VFSB40-030	4	7
Back Mount U- Clamp Vacuum Gauges		
VFSB25-030U	2-1/2	7
VFSB40-030U	4	7

Pressure Code Range	**PSI/Hg**
1	15, 30, 60, 100, 160, 200, 300 PSI
2	Same As Range 1 Plus 600, 1000, 2000, 3000, 5000 PSI
3	Same As Range 1 Plus 600, 1000, 2000, 3000, 5000, 6000 PSI
4	Same As Range 1 Plus 400, 600, 1000, 1500, 2000, 3000, 4000, 5000, 6000 PSI
5	Same As Range 1 Plus 400, 600, 1000, 1500, 2000, 3000, 5000, 6000 psI
6	10,000, 15000 PSI
7	-30” to 0” Hg

APPENDIX F

HASP and CAMP

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

Overview

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

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

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

Community Air Monitoring Plan

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

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

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “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, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the

work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

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

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

December 2009

LABELLA Associates, P.C.

Engineering
Architecture
Environmental

Site Health and Safety Plan

Location:

Lake Ontario Mariner's Marina
12548 Eastman Tract
Henderson Harbor, New York, 13651

Prepared For:

The Upstate National Bank
One West Main Street
Rochester, New York 14614

July 2010

Site Health and Safety Plan

Location:

Lake Ontario Mariner's Marina
12548 Eastman Tract
Henderson Harbor, New York, 13651

Prepared For:

The Upstate National Bank
One West Main Street
Rochester, New York 14614

July 2010

LaBella Associates, P.C.
300 State Street
Rochester, New York 1464

Table of Contents

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
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
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
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

Table 1 (continued)
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
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	Almond		NA
Cadmium	0.2	0.5	NA	NA	NA				NA
Chromium	1	0.5	NA	NA	NA				NA
Lead	0.05	0.15	NA	NA	NA	700			NA
Mercury	0.05	0.05	NA	NA	NA	28	Odorless		NA
Selenium	0.2	0.02	NA	NA	NA	Unknown			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.

SITE HEALTH AND SAFETY PLAN

Project Title:	Lake Ontario Mariner's Marina
Project Number:	207820
Project Location (Site):	12548 Eastman Tract, Henderson Harbor, New York, 13651
Environmental Director:	Gregory Senecal, CHMM
Project Manager:	Dennis Porter, CHMM
Plan Approval Date:	_____
Plan Review Date:	_____
Site Safety Supervisor:	To Be Determined
Site Contact:	To Be Determined
Safety Director:	Rick Rote, CIH
Proposed Date(s) of Field Activities:	To Be Determined
Site Conditions:	Slightly sloping, encompassing approximately 8.4 acres
Site Environmental Information Provided By:	• Phase I Environmental Site Assessment completed by Passero Associates dated October 11, 2001 • Limited Phase II Investigation completed by Environmental InSite, Inc. dated April 4, 2002. • Proposed Remedial Investigation Work Plan completed by Strategic Environmental Management, Inc. dated October 3, 2002. This report was submitted to the NYSDEC but was never implemented. • Expanded Site Investigation Report completed by phA Environmental Restoration, Inc. dated December 2005 • IRM Report completed by LaBella Associates, P.C. dated March 15, 2010
Air Monitoring Provided By:	LaBella Associates, P.C.
Site Control Provided By:	To Be Determined.

EMERGENCY CONTACTS

	Name	Phone Number
Ambulance:	As Per Emergency Service	911
Hospital Emergency:	Samaritan Medical Center	315-785-4000
Poison Control Center:	Henderson Fire District Building	315-938-5032
Police (local, state):	Henderson Police	911
Fire Department:	Henderson Fire Department	911
Site Contact / Site Safety Supervisor:	To Be Determined	
Agency Contact:	NYSDEC Reg. 6 – William Jesmore	315-785-2513
Environmental Director:	Greg Senecal, CHMM	Direct: 585-295-6243 Cell: 585-752-6480 Home: 585-323-2142
Project Manager:	Dennis Porter, CHMM	Direct: 585-295-6245 Cell: 585-451-4854 Home: 585-289-3380
Safety Director	Rick Rote, CIH	Direct: 585-295-6241 Cell: 585-414-8891

MAP AND DIRECTIONS TO THE MEDICAL FACILITY
- SAMARITAN MEDICAL CENTER -

1: Start out going NORTHEAST on CR-123 toward ROCKLEDGES SUB 1. 1.4 miles
2: Turn RIGHT. <0.1 miles
3: Turn LEFT onto NY-3. 5.9 miles
4: Turn RIGHT onto CR-62 / SULPHUR SPRINGS RD. 4.8 miles
5: Turn LEFT onto CR-63 / MASSEY ST RD. Continue to follow CR-63. 4.2 miles
6: CR-63 becomes S MASSEY ST. 0.9 miles
7: Turn SLIGHT RIGHT onto PADDOCK ST. 0.7 miles
8: Turn RIGHT onto WASHINGTON ST / US-11. 0.2 miles
9: End at 830 Washington St Watertown, NY 13601-4034, US Total Est. Time: 27 minutes Total Est.

1.0 Introduction

The purpose of this Health and Safety Plan (HASP) it to provide guidelines for responding to potential health and safety issues that may be encountered during the implementation of the Remedial Investigation Work Plan (RIWP) at the Lake Ontario Mariner's Marina located at 12548 Eastman Tract in the Town of Henderson, Jefferson County, New York. This HASP only reflects the policies of LaBella Associates 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 and other regulatory body.

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:

- Management of environmental investigation activities
- Environmental Monitoring
- Collection of samples

4.0 Work Area Access and Site Control

The contractor 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 or her instructions must be followed.

5.1 Hazards Due to Heavy Machinery

Potential Hazard:
Heavy machinery including trucks, Geoprobe, drilling equipment, excavators, backhoes, 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).

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.

5.3 Cuts, Punctures and Other Injuries

Potential Hazard:
In any excavation or 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:
Volatile organic vapors from petroleum products or other chemicals may be encountered during excavation activities at the project work site. Inhalation of high concentrations of organic vapors can cause headache, stupor, drowsiness, confusion and other health effects. Skin contact can cause irritation, chemical burn, or dermatitis. Previous investigations completed at the Site indicate that the constituents of concern are limited to petroleum related compounds. Table 1, lists potential chemicals at the Site.

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 or benzene readings of 1.0 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 5.4), 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. Air monitoring will consist at a minimum of the procedure listed below. Air monitoring instruments will be calibrated and maintained in accordance with the manufacturer's specifications.

The Air Monitor will utilize a photoionization Detector (PID) to screen the ambient air in the work areas (excavation, soil staging, and soil grading areas) for total Volatile Organic Compounds (VOCs) and a DustTrak tm Model 8520 aerosol monitor or equivalent for measuring particulates. Work area ambient air will generally be monitored in the work area and downwind of the work area. Air monitoring of the work areas and downwind of the work areas will be conducted in accordance with the New York State Department of Health *Generic Community Air Monitoring Plan*.

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 and wait at the assigned 'safe area'. 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.

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APPENDIX G

Monitoring Well Construction Log

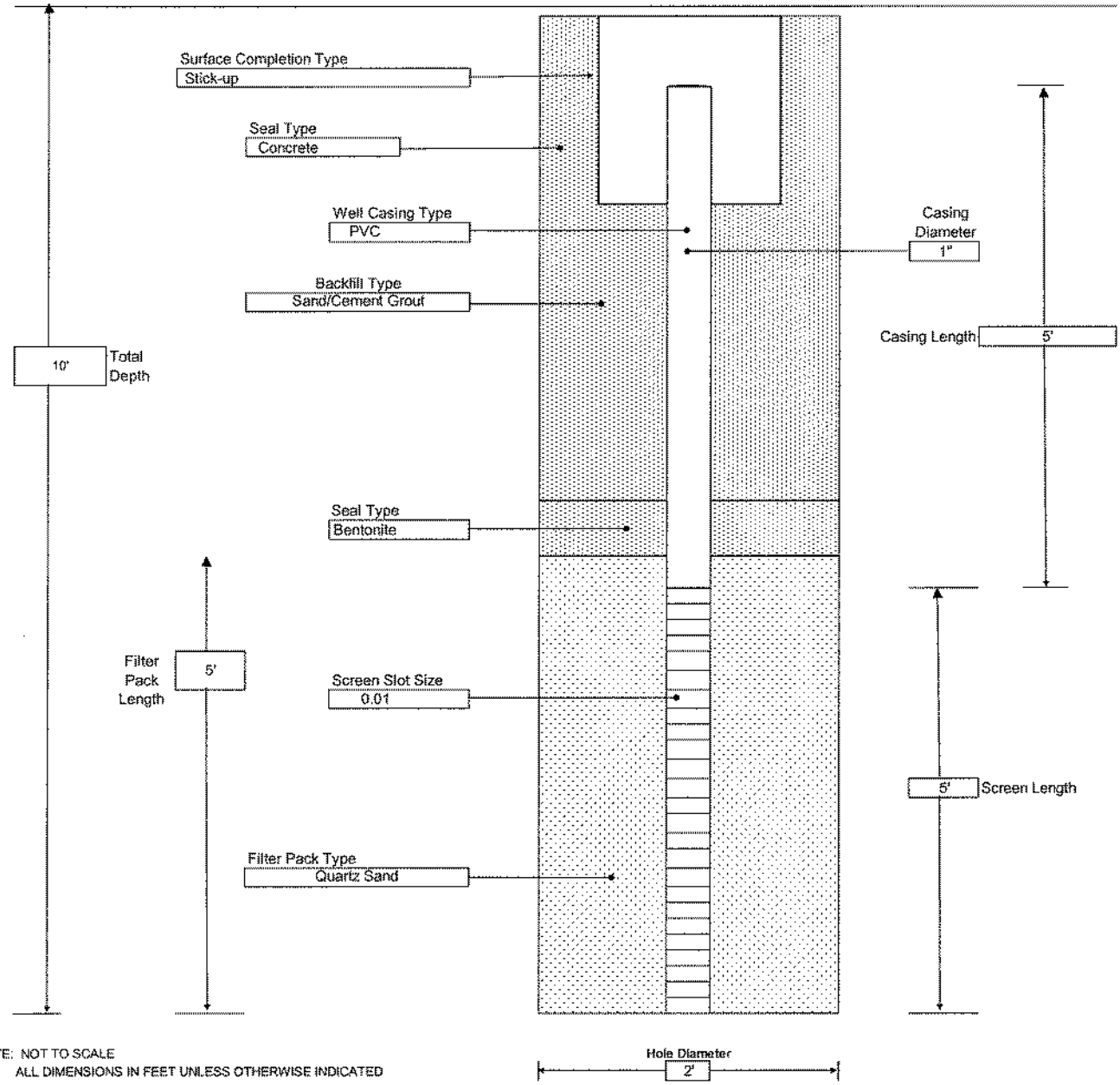
LABELLA Associates, P.C. 300 STATE STREET, ROCHESTER, NEW YORK ENVIRONMENTAL ENGINEERING CONSULTANTS	PROJECT Groundwater Monitoring Well Construction Lake Ontario Mariner's Marina Henderson Harbor, New York	BORING: MW-12 SHEET 1 OF 1 JOB # 207820 CHKD. BY:

CONTRACTOR: TREC Environmental
DRILLER: S. Stockmaster
LABELLA REPRESENTATIVE: SRD

BORING LOCATION: B-15
GROUND SURFACE ELEVATION: N/A DATUM: N/A
START DATE: 10/6/10 END DATE:

TYPE OF DRILL RI Dolly mounted 420 model
AUGER SIZE AND TYPE: N/A
OVERBURDEN SAMPLING METHOD: macrocore
ROCK DRILLING METHOD: N/A

WATER LEVEL DATA				
DATE	TIME	WATER	CASING	REMARKS



NOTE: NOT TO SCALE
ALL DIMENSIONS IN FEET UNLESS OTHERWISE INDICATED

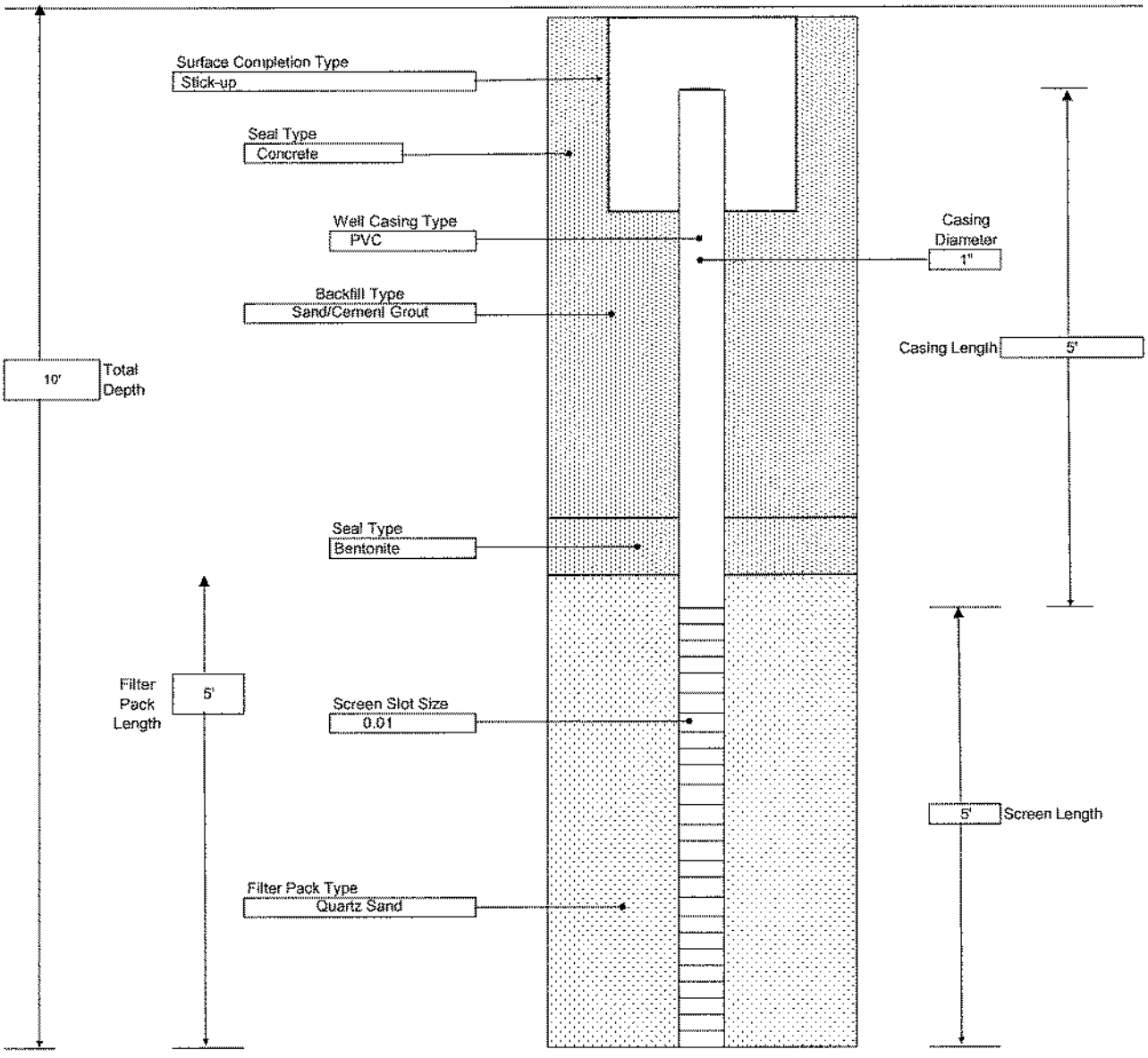
GENERAL NOTES:
1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

LABELLA Associates, PC. 300 STATE STREET, ROCHESTER, NEW YORK ENVIRONMENTAL ENGINEERING CONSULTANTS	PROJECT Groundwater Monitoring Well Construction Lake Ontario Mariner's Marina Henderson Harbor, New York	BORING: MW-13 SHEET 1 OF 1 JOB # 207820 CHKD. BY:

CONTRACTOR: TREC Environmental	BORING LOCATION: B-16
DRILLER: S. Stockmaster	GROUND SURFACE ELEVATION: N/A DATUM: N/A
LABELLA REPRESENTATIVE: SRD	START DATE: 10/6/10 END DATE:
TYPE OF DRILL RI Truck-mounted rig	
AUGER SIZE AND TYPE: N/A	
OVERBURDEN SAMPLING METHOD: macrocore	
ROCK DRILLING METHOD: N/A	

WATER LEVEL DATA

DATE	TIME	WATER	CASING	REMARKS



NOTE: NOT TO SCALE
ALL DIMENSIONS IN FEET UNLESS OTHERWISE INDICATED

GENERAL NOTES:

1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

APPENDIX H

Groundwater Sampling Log

LABELLA Associates, P.C.

300 State Street
Rochester, New York 14614

Telephone: (585) 454-6110
Facsimile: (585) 454-3066

Project Name: Lake Ontario Mariners Marina (LOMM), VCA Index No. A4-0463-0602
Location: 12548 Eastman Tract, Henderson Harbor, New York
Project No.: 207820
Sampled By: MFP
Date:
Weather:

Well ID	Well Diameter (in.)	Static Water Level (ft)	Depth of Well (ft)	One Well Volume (gal)	Total Volume Purged (gal)	Petroleum Odor (Yes/No)	Sample Time	Notes

APPENDIX I

Site-wide Inspection Form

	SITE-WIDE INSPECTION FORM
	Project Name: NYSDEC Site No. V00585
	Location: Lake Ontario Mariner's Marina, Henderson Harbor, New York
300 State Street Rochester, New York 14614 Phone: (585) 454-6110 Fax: (585) 454-3066	Project No.: 207820
	Inspected By:
	Date of Inspection:
	Weather Conditions:

1. COMMENTS ON GENERAL SITE CONDITIONS: _____

_____

_____

2. CURRENT USE OF SITE: _____

3. ARE CURRENT SOIL CONDITIONS IN ACCORDANCE WITH THE EXCAVATION WORK PLAN? YES/NO

If No, Explain and indicate actions to be taken: _____

_____

4. PHOTOGRAPHS TAKEN? YES/NO

5. SITE RECORDS UP TO DATE? YES/NO

6. SUB-SLAB DEPRESSURIZATION SYSTEM

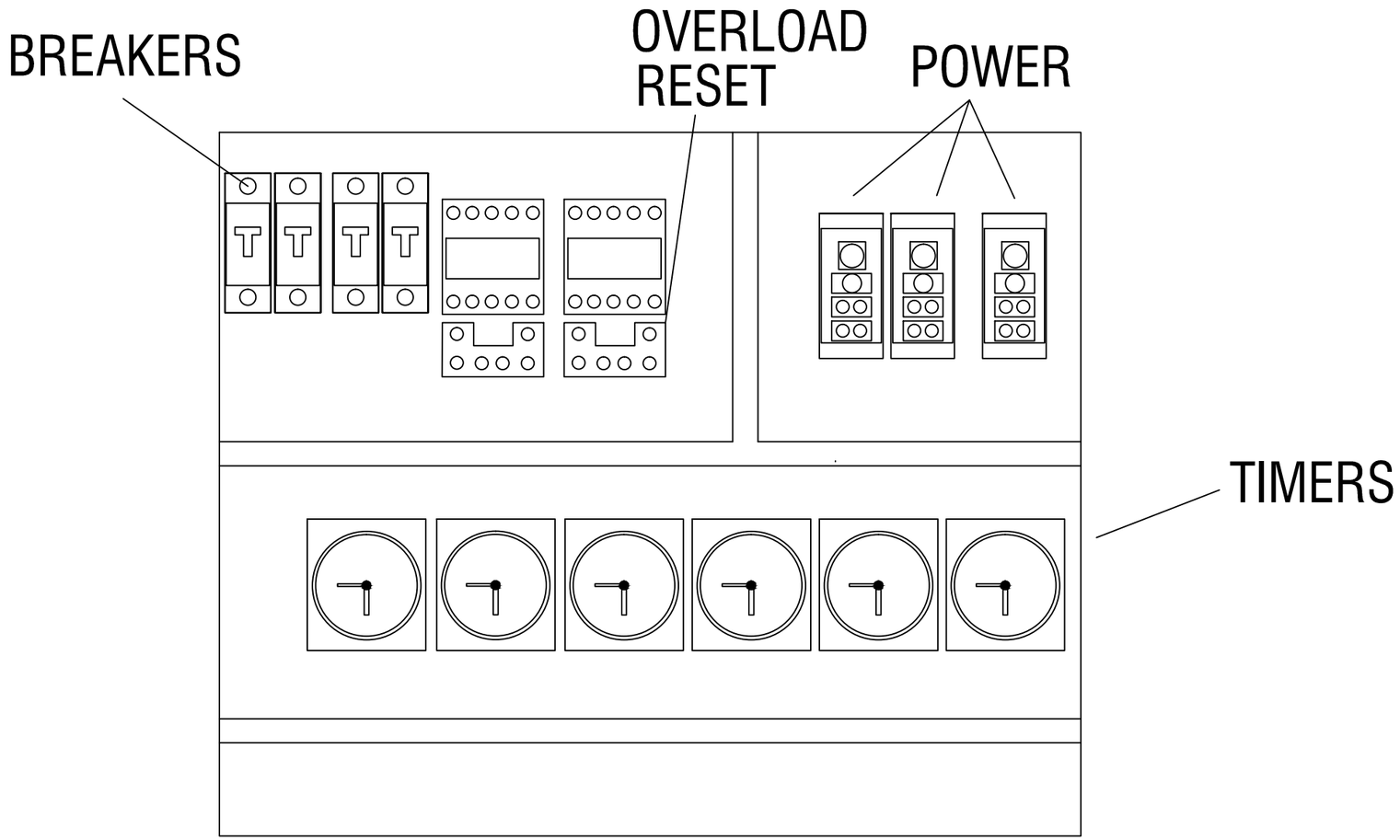
- Manometer Reading = ____
- Vent fans functioning properly?
- Do vent pipes and/or wiring appear damaged?
- Is the alarm functioning properly?

7. AIR SPARGE/SOIL VAPOR EXTRACTION SYSTEM

- Air compressor functioning properly?
- Do piping, wiring or shed appear damaged?
- Heat exchangers?
- Solenoid valves?
- Flow meters and gauges?
- Control panel?

(General locations of each of these system features are shown on the as-built figures included in Appendix I of the SMP.)

COMMENTS AND/OR ACTIONS TAKEN



CONTROL PANEL INTERIOR

NOTES: NOT TO SCALE. FOR INFORMATIONAL PURPOSES ONLY.

LABELLA Associates, P.C.
300 STATE STREET
ROCHESTER, NY 14614
P: (585) 454-6110
F: (385) 454-3066
www.labellapc.com

PROJECT/CLIENT
LAKE ONTARIO MARINER'S MARINA
NYSDEC SITE NO. V-00525-6
12548 EASTMAN TRACT
HENDERSON HARBOR, NEW YORK

DRAWING TITLE
AIR SPARGING SYSTEM
CONTROL PANEL

ISSUED FOR
FINAL

DESIGNED BY: ENVIRO-EQUIPMENT, INC.
DRAWN BY: JMG
REVIEWED BY: DPR
DATE: AUGUST 2014

PROJECT/DRAWING NUMBER
207820
003

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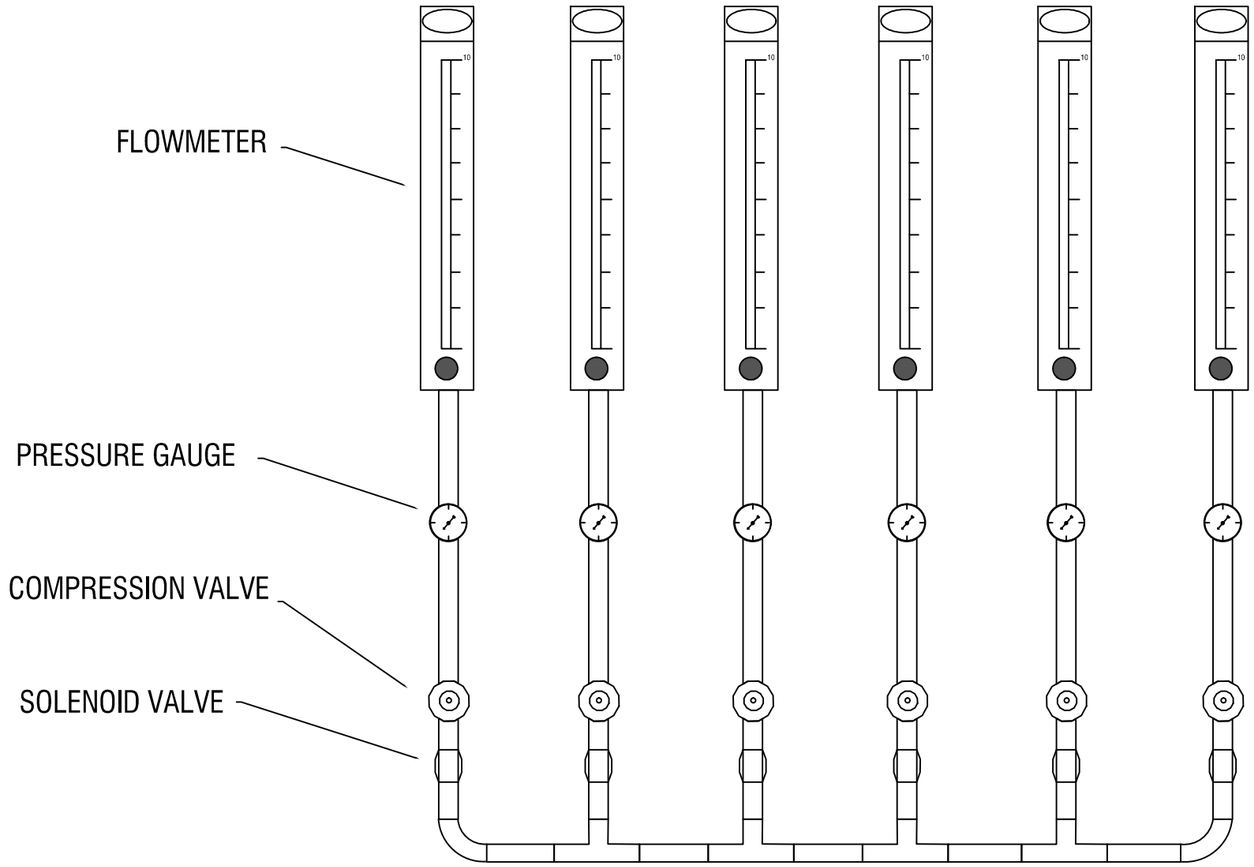

FLOWMETERS

NOTES: NOT TO SCALE. FOR INFORMATIONAL PURPOSES ONLY.

LABELLA Associates, P.C.
300 STATE STREET
ROCHESTER, NY 14614
P: (585) 454-6110
F: (385) 454-3066
www.labellapc.com
contact: C.Cox

PROJECT/CLIENT
LAKE ONTARIO MARINER'S MARINA
NYSDEC SITE NO. V-00525-6

12548 EASTMAN TRACT
HENDERSON HARBOR, NEW YORK

DRAWING TITLE
AIR SPARGING SYSTEM
FLOWMETERS

ISSUED FOR
FINAL

DESIGNED BY: ENVIRO-EQUIPMENT, INC.
DRAWN BY: JMG
REVIEWED BY: DPK
DATE: AUGUST 2014

PROJECT/DRAWING NUMBER
207820
004

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Appendix J

Quality Assurance Project Plan

Quality Assurance Project Plan

Location:

Lake Ontario Mariner's Marina
12548 Eastman Track
Henderson Harbor, New York

Prepared For:

The Upstate National Bank
One West Main Street
Rochester, New York 14614

LaBella Project No. 207820

February 2015

Quality Assurance Project Plan (QAPP)

Location:

Lake Ontario Mariner's Marina
12548 Eastman Track
Henderson Harbor, New York

Prepared For:

The Upstate National Bank
One West Main Street
Rochester, New York 14614

LaBella Project No. 207820

February 2015

LaBella Associates, D.P.C.
300 State Street
Rochester, New York 14614

Table of Contents

Table of Contents (continued)

Page

1. Introduction

LaBella's Quality Assurance Project Plan (QAPP) is an integral part of its approach to environmental investigations. By maintaining a rigorous QAPP, our firm is able to provide accurate and reliable data. A QAPP also provides safe working conditions for all on-site workers.

The QAPP contains procedures, which provide for collected data to be properly evaluated, and which document that quality control procedures have been followed in the collection of samples. The quality control program represents the methodology and measurement procedures used in collecting quality field data. This methodology includes the proper use of equipment, documentation of sample collection, and sample handling practices.

Procedures used in the firm's QAPP are compatible with federal, state, and local regulations, as well as, appropriate professional and technical standards.

This QAPP has been organized into the following areas:

- QAPP Objectives and Checks
- Field Equipment, Handling, and Calibration
- Sampling Techniques
- Sample Handling and Packaging

2. QAPP Objectives

The United States Environmental Protection Agency (EPA) has identified five general levels of analytical data quality as being potentially applicable to site investigations conducted under CERCLA. These levels are summarized below:

- **Level I -** Field screening. This level is characterized by the use of portable instruments, which can provide real-time data to assist in the optimization of sampling point locations and for health and safety support. Data can be generated regarding the presence or absence of certain contaminants (especially volatiles) at sampling locations.
- **Level II -** Field analysis. This level is characterized by the use of portable analytical instruments, which can be used on site or in mobile laboratories stationed near a site (close-support labs). Depending upon the types of contaminants, sample matrix, and personnel skills, qualitative and quantitative data can be obtained.
- **Level III -** Laboratory analysis using methods other than the Contract Laboratory Program (CLP) Routine Analytical Services (RAS). This level is used primarily in support of engineering studies using standard EPA-approved procedures. Some procedures may be equivalent to CLP RAS, without the CLP requirements for documentation.
- **Level IV -** CLP Routine Analytical Services. This level is characterized by rigorous quality control (QC) protocols and documentation and provides qualitative and quantitative analytical data. Some regions have obtained similar support via their own regional laboratories, university laboratories, or other commercial laboratories.
- **Level V -** Non-standard methods. Analyses, which may require method modification and/or development. CLP Special Analytical Services (SAS) are considered Level V.

Unless stated otherwise, all data will be generated in accordance with Level IV. When CLP methodology is not available, federal and state approved methods will be utilized. Level III will be utilized, as necessary, for non-CLP RAS work which may include ignitability, corrosivity, reactivity, EP toxicity, and other state approved parameters for characterization. Level I will be used throughout the RI for health and safety monitoring activities.

All measurements will be made to provide that analytical results are representative of the media and conditions measured. Unless otherwise specified, all data will be calculated and reported in units consistent with other organizations reporting similar data to allow comparability of data bases among organizations. Data will be reported in µg/L and mg/L for aqueous samples, and µg/kg and mg/kg (dry weight) for soils, or otherwise as applicable.

The characteristics of major importance for the assessment of generated data are accuracy, precision, completeness, representativeness, and comparability. Application of these characteristics to specific projects is addressed later in this document. The characteristics are defined below.

2.1. Accuracy

Accuracy is the degree of agreement of a measurement or average of measurements with an accepted reference or "true" value and is a measure of bias in the system.

2.2. Precision

Precision is the degree of mutual agreement among individual measurements of a given parameter.

2.3. Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under correct normal conditions.

2.4. Representativeness

Representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition

Careful choice and use of appropriate methods in the field will ensure that samples are representative. This is relatively easy with water or air samples since these components are homogeneously dispersed. In soil and sediment, contaminants are unlikely to be evenly distributed, and thus it is important for the sampler and analyst to exercise good judgment when removing a sample.

2.5. Comparability

Comparability expresses the confidence with which one data set can be compared to another. The data sets may be inter- or intra- laboratory.

3. Measurement of Data Quality

3.1. Accuracy

Accuracy of a particular analysis is measured by assessing its performance with "known" samples. These "knowns" take the form of EPA standard reference materials, or laboratory prepared solutions of target analytes spiked into a pure water or sample matrix. In the case of GC or GC/MS analyses, solutions of surrogate compounds, which can be spiked into every sample and are designed to mimic the behavior of target analytes without interfering with their determination, are used.

In each case the recovery of the analyte is measured as a percentage, correcting for analytes known to be present in the original sample if necessary, as in the case of a matrix spike analysis. For EPA supplied known solutions, this recovery is compared to the published data that accompany the solution.

For the firm's prepared solutions, the recovery is compared to EPA-developed data or the firm's historical data as available. For surrogate compounds, recoveries are compared to EPA CLP acceptable recovery tables.

If recoveries do not meet required criteria, then the analytical data for the batch (or, in the case of surrogate compounds, for the individual sample) are considered potentially inaccurate. The analyst or his supervisor must initiate an investigation of the cause of the problem and take corrective action. This can include recalibration of the instrument, reanalysis of the quality assurance (QA)/QC sample, reanalysis of the samples in the batch, or flagging the data as suspect if the problems cannot be resolved. For highly contaminated samples, recovery of the matrix spike may depend on sample homogeneity. As a rule, analyses are not corrected for recovery of matrix spike or surrogate compounds.

3.2. Precision

Precision of a particular analysis is measured by assessing its performance with duplicate or replicate samples. Duplicate samples are pairs of samples taken in the field and transported to the laboratory as distinct samples. Their identity as duplicates is sometimes not known to ASC and usually not known to bench analysts, so their usefulness for monitoring analytical precision at bench level is limited. For most purposes, precision is determined by the analysis of replicate pairs (i.e., two samples prepared at the laboratory from one original sample). Often in replicate analysis the sample chosen for replication does not contain target analytes so that quantitation of precision is impossible. For EPA CLP analyses, replicate pairs of spiked samples, known as matrix spike/matrix spike duplicate samples, are used for precision studies. This has the advantage that two real positive values for a target analyte can be compared.

Precision is calculated in terms of Relative Percent Difference (RPD).

- Where X_1 and X_2 represent the individual values found for the target analyte in the two replicate analyses or in the matrix spike/matrix spike duplicate analyses.
- RPDs must be compared to the method RPD for the analysis. The analyst or his supervisor must investigate the cause of RPDs outside stated acceptance limits. This may include a visual inspection of the sample for non homogeneity, analysis of check samples, etc. Follow-up action may include sample reanalysis or flagging of the data as suspect if problems cannot be resolved.

- During the data review and validation process (see Section 9), field duplicate RPDs are assessed as a measure of the total variability of both field sampling and laboratory analysis.

3.3. Completeness

Completeness for each parameter is calculated as follows:

- The firm's target value for completeness for all parameters is 100%. A completeness value of 95% will be considered acceptable. Incomplete results will be reported to the site managers. In planning the field sample collection, the site manager will plan to collect field duplicates from identified critical areas. This procedure should assure 100% completeness for these areas.

3.4. Representativeness

The characteristic of representativeness is not quantifiable. Subjective factors to be taken into account are as follows:

- The degree of homogeneity of a site;
- The degree of homogeneity of a sample taken from one point in a site; and
- The available information on which a sampling plan is based.

To maximize representativeness of results, sampling techniques and sample locations will be carefully chosen so that they provide laboratory samples representative of the site and the specific area. Within the laboratory, precautions are taken to extract from the sample bottle an aliquot representative of the whole sample. This includes premixing the sample and discarding pebbles from soil samples.

4. Quality Control Targets

Target values for detection limit, percent spike recovery and percent "true" value of known check standards, and RPD of duplicates/replicates are included in the QAPP, Analytical Procedures. Note that tabulated values are not always attainable. Instances may arise where high sample concentrations, non homogeneity of samples, or matrix interferences preclude achievement of target detection limits or other quality control criteria. In such instances, the firm will report reasons for deviations from these detection limits or noncompliance with quality control criteria.

5. Sampling Procedures

This section describes the sampling procedures to be utilized for each environmental medium that will be collected and analyzed in accordance with appropriate state and federal requirements. All procedures described are consistent with EPA sampling procedures as described in SW-846, third edition, September 1986. All samples will be delivered to the laboratory within 24 to 28 hours of collection.

6. Soil & Groundwater Investigation

The groundwater sampling plan outlined in this subsection has been prepared in general accordance with RCRA Groundwater Monitoring Technical Enforcement Guidance Document 9950.1 (September 1986), Office of Solid Waste and Emergency Response.

Prior to drilling, all drill sites will be cleared with appropriate utility companies to avoid potential accidents relating to underground utilities.

6.1. Test Borings and Well Installation

6.1.1. Drilling Equipment

Direct Push "Geo-Probe" Soil Borings:

Borings will be advanced with a "geo-probe" direct push sampling system. The use of direct push technology allows for rapid sampling, observation, and characterization of relatively shallow overburden soils. The geo-probe utilizes a four-foot macro-core sampler, with disposable polyethylene sleeves. Soil cores will be retrieved in four-foot sections, and can be easily cut from the polyethylene sleeves for observation and sampling. The macro-core sampler will be decontaminated between samples and borings using an alconox and water solution.

Drill Rig Advanced Soil Borings:

The drilling and installation of monitoring wells will be performed using a rotary drill rig which will have sufficient capacity to perform 4 1/2-inch inside diameter (ID) hollow-stem auger drilling in the overburden, retrieve split-spoon samples, and perform necessary rock coring to provide a minimum 3-inch diameter core, known in the industry as "NX." The borehole may be reamed to 5 1/2-inch diameter prior to monitoring well installation as cased hole in the bedrock, or may be left as open hole, with NYSDEC concurrence.

6.1.2. Drilling Techniques

Direct Push "Geo-Probe" Advanced Borings:

Prior to initiating drilling activities, the Geo-probe, macro cores, drive rods, pertinent equipment, well pipe and screens will be steam cleaned or washed with an alconox and water solution followed by a clean water rinse. This cleaning procedure will also be used between each boring. These activities will be performed in a designated on-site decontamination area. Throughout and after the cleaning processes, direct contact between the equipment and the ground surface will be avoided. Plastic sheeting and/or clean support structures (e.g., pallets, sawhorses) will be used. The drilling rig and all equipment will be steam cleaned upon completion of the investigation and prior to leaving the site.

Test borings will be advanced with 2-inch direct push macro-cores through overburden soils. Drilling fluids, other than water from a NYSDEC-approved source, will not be allowed without special consideration and agreement from NYSDEC. The use of lubricants is also not allowed unless approved by the NYSDEC representative.

It will be the responsibility of the consultant to arrange for the appropriate drilling equipment to be present at the site. Standby time to arrange for additional equipment or a water supply will not be allowed unless caused by unexpected site conditions.

During the drilling, a Photoionization detector (PID) will be used to monitor the gases exiting the hole. Macro-core cuttings will be contained if the PID meter readings are greater than 5 ppm above background or the cuttings show visible evidence of contamination.

Drill Rig Advanced Borings:

Prior to initiating drilling activities, the drilling rig, augers, rods, split spoons, pertinent equipment, well pipe and screens will be steam cleaned. This cleaning procedure will also be used between each boring. These activities will be performed in a designated on-site decontamination area. Throughout and after the cleaning processes, direct contact between the equipment and the ground surface will be avoided. Plastic sheeting and/or clean support structures (e.g., pallets, sawhorses) will be used. The drilling rig and all equipment will be steam cleaned upon completion of the investigation and prior to leaving the site.

Test borings will be advanced with 4 1/2-inch (ID) hollow stem augers through overburden, and NX-sized diamond core barrels in competent rock, driven by truck-, track-, or trailer-mounted drilling equipment. Alternative methods of drilling or equipment may be allowed or requested for site-specific criteria, but must be approved by the NYSDEC. Drilling fluids, other than water from a NYSDEC-approved source, will not be allowed without special consideration and agreement from NYSDEC. The use of lubricants is also not allowed unless approved by the NYSDEC representative. One sample from each drilling water source may be analyzed for full TCL.

It will be the responsibility of the consultant to arrange for the appropriate drilling equipment to be present at the site. Standby time to arrange for additional equipment or a water supply will not be allowed unless caused by unexpected site conditions.

During the drilling, a photoionization detector (PID) will be used to monitor the gases exiting the hole. Auger cuttings will be contained if the PID meter readings are greater than 5 ppm above background or the cuttings show visible evidence of contamination.

Where bedrock wells are required, test borings shall be advanced into rock with NX coring tools. Only water from an approved source shall be used in rock coring. The consultant shall monitor and record the petrology, core recovery, fractures, rate of advance, water levels, and water lost or produced in each test boring. The Rock Quality Determination (RQD) value shall be calculated for each 5-foot core. Each core shall be screened with a PID upon extraction to determine proper handling procedure. All core samples shall be retained and stored by the consultant, for review by NYSDEC, in an approved wooden core box for a period of not less than one year.

Bedrock well installation will involve construction of a rock socket. The socket will be drilled into the top of rock at each bedrock well location to allow permanent 3-inch casing to be grouted securely in place prior to completion of the well. The purpose for this is to provide a seal at the overburden/bedrock interface and into the upper bedrock surface, to prevent the entrance of overburden water into the bedrock.

To construct the rock socket, a core hole will be reamed out to a minimum diameter of 3 7/8-inches and set into the first 5-feet of bedrock. This will allow the placement of permanent 3-inch diameter Polyvinyl chloride (PVC) well casing into the bedrock surface. The method selected may be percussion or rotary drilling at the option of the subcontractor. The method and equipment selected must be capable of penetrating the bedrock at each well location to a depth required by the work plan and will be selected based on the results of the rock coring performed.

While the augers are seated on top of bedrock, a cement grout will be tremied into the bedrock socket. Once sufficient grout has been place, the 3-inch PVC casing will be lowered into the bedrock socket. A PVC plug will be placed in the end of the 3-inch PVC casing, prior to insertion in the borehole, to prevent grout from entering the PVC casing. Once the 3-inch PVC casing is in place, the augers can be removed

and the remaining grout should be added. After the grout and 3-inch PVC casing have set up for 24 hours, the remaining amount of bedrock can be NX cored through the 3-inch PVC casing to a depth determined by the RI work plan.

6.1.3. Well Casing (Riser)

Direct Push Geo-Probe Groundwater Monitoring Wells:

Direct Push Geo-Probe advanced groundwater-monitoring wells utilized 1.25-inch threaded flush joint PVC pipe.

Drill Rig Advanced Groundwater Monitoring Wells:

The well riser shall consist of 2-inch or 4-inch diameter, threaded flush-joint PVC pipe. All well risers will conform to the requirements of ASTM-D 1785 Schedule 40 pipe, and shall bear markings that will identify the material as that which is specified. All materials used to construct the wells will be NSF/ASTM approved.

6.1.4. Well Screen

Direct Push Geo-Probe Groundwater Monitoring Wells:

Direct Push Geo-Probe advanced groundwater-monitoring wells utilized 1.25-inch diameter well screen. Groundwater-monitoring wells will set to intersect the top of the shallow overburden groundwater table. Each geo-probe advanced well will be equipped with 5 to 10 feet (based on anticipated groundwater level and bedrock depth) of .010 inch slotted PVC screen connected to an appropriate length of PVC riser to complete the well installation.

Drill Rig Advanced Groundwater Monitoring Wells:

Generally, wells will be constructed with 10-foot machine-slotted screens, unless otherwise specified or dictated by field conditions (i.e., screens of less than 10-feet in length may be used, depending on the characteristics of the well). The well screen slot size will be selected based on the filter pack grain size and the ability to hold back 85 percent or more of the filter pack materials. Screen and riser sections shall be joined by flush-threaded coupling to form watertight unions that retain 100% of the strength of the casing. Solvent PVC glue shall not be used at any time in the construction of the wells. The bottom of the screen shall be sealed with a treated cap or plug. No lead shot or lead wool is to be employed in sealing the bottom of the well or for sealant at any point in the well.

All risers and screens shall be set round, plumb, and true to line.

6.1.5. Artificial Sand Pack

Granular backfill will be chemically and texturally clean (as determined using a 10x hand lens), inert, siliceous, and of appropriate grain size for the screen slot size and the host environment. Sand pack grain size will be selected based on sieve analyses of formation samples. The sand pack will be installed using a tremie pipe and the casing will be equipped with centralizers (wells 15 ft. or deeper only) to minimize the tendency for particle separation and bridging. Prior to casing and screen insertion, a minimum of 1-foot of gravel-pack bedding will be placed in the bottom of the hole. The well screen and casing will be installed, and the sand pack placed around the screen and casing to a depth extending at least 25 percent of the screen length above the top of the screen.

6.1.6. Bentonite Seal

A minimum 2-foot thick seal of tamped bentonite pellets will be placed directly on top of the sand pack, and care will be taken to avoid bridging. The seal will be measured immediately after placement, without allowance for swelling.

6.1.7. Grout Mixture

Upon completion of the bentonite seal, the well will be grouted with a non-shrinking cement grout (e.g., Volclay®) mix to be placed from the top of the bentonite seal to the ground surface. The cement grout shall consist of a mixture of Portland cement (ASTM C 150) and water, in the proportion of not more than 7 gallons of clean water per bag of cement (1 cubic foot or 94 pounds). Additionally, 3% by weight of bentonite powder shall be added, if permitted.

6.1.8 Surface Protection

At all times during the progress of the work, precautions shall be used to prevent tampering with or the entrance of foreign material into the well. Upon completion of the well, a suitable lockable cap shall be installed to prevent material from entering the well. The PVC well riser shall be protected by a flush mounted road box set into a concrete pad. A concrete pad, sloped away from the well, shall be constructed around the flush mount road box at ground level.

Any well that is to be temporarily removed from service or left incomplete due to delay in construction shall be capped with a watertight cap and equipped with a "vandal-proof" cover, satisfying applicable NYSDEC regulations or recommendations.

6.1.9. Surveying

Coordinates and elevations will be established for each monitoring well and sampling location. Elevations to the closest 0.01 foot shall be used for the survey. These elevations shall be referenced to a regional, local, or project-specific datum. USGS benchmarks will be used whenever available. The location, identification, coordinates, and elevations of the wells will be plotted on maps with a scale large enough to show their location with reference to other structures at each site.

6.1.10. Well Development

After completion of the well, but not sooner than 24 hours after grouting is completed, development will be accomplished using pumping, bailing, or surge blocking. No dispersing agents, acids, disinfectants, or other additives will be used during development or introduced into the well at any other time. During development, water will be removed throughout the entire water column by periodically lowering and raising the pump intake (or bailer stopping point).

Well development will include washing the entire well cap and the interior of the well casing above the water table, using only water from the well itself. As a result of this operation, the well casing will be free of extraneous materials (grout, bentonite, and sand) inside the riser, well cap, and blank casing between top of the well casing and water table. This washing will be conducted before and/or during development; not after development. Development water will be either properly contained and treated as waste until the results of chemical analysis of samples are obtained or discharged on site as determined by the site-specific work plans and/or consultation with the NYSDEC representatives on site.

The development process will continue until a stabilization of pH, specific conductance, temperature, and clarity (goal of <50 NTUs) of the discharge is achieved or for a maximum of two hours.

After final development of the well, water levels will be recorded and approximately 1 liter of water from the well will be collected in a clear glass jar, labeled and photographed, and submitted as part of the well log. The photograph will be taken to show the relative clarity of the water. Visual identification of the physical characteristics of removed sediments will also be recorded.

7. Geologic Logging and Sampling

At each investigative location, the boring will be advanced through overburden using either a drill rig and hollow-stem auger or direct push technology; soils will be visually inspected for stains and monitored with a PID to help determine potential for vertical migration of contaminants. Soil samples will be collected continuously in both the unsaturated soil zone and the saturated zone. Selected wells will be sampled continuously over the entire depth of the well. The sampling device will be decontaminated according to procedures outlined in the Decontamination section of this document. The split-spoon sampler will be driven into the soil using a 140-pound safety hammer and allowed to free-fall 30-inches, in accordance with ASTM-D 1586-84 specifications. The number of blows required to drive the sampler each 6-inches of penetration will be recorded. Soil samples will be screened in the field for volatile organic vapors using a PID, classified in accordance with Unified Soil Classification System (USCS) specifications, and logged. Samples will be stored in glass jars until they are needed for testing or the project is complete.

All samples will be screened with a PID during collection. The headspace of all samples taken in the field will be screened using USEPA method 3810.

Monitoring well borings will be advanced to maximum design depth below the ground surface, as indicated by the work plan for each site. If hard boulders or bedrock result in auger refusal, rock coring will be used to advance the hole to design depth. If hydrogeologic conditions are favorable for well installation at a depth less than design, the well will be installed at the boring or coring termination depth. In the event that maximum design depth is reached and hydrogeologic conditions are not suitable for well installation, the maximum drilling depth will be revised. Hydrogeologic suitability for well emplacement will be determined by the supervising geologist in consultation with NYSDEC, based on thickness and estimated hydraulic conductivity of the saturated zone encountered. If necessary, the borehole will be advanced to water or abandoned.

Boulders and bedrock encountered during well installation shall be cored by standard diamond-core drilling methods using an "NX" size core barrel. All rock cores recovered will be logged by a geologist, labeled, photographed, and stored in wooden core boxes. The photographs will be submitted as part of the completed boring logs. The cores will be stored by the firm until the project is completed or for at least one year. Drilling logs will be prepared by an experienced geologist or geotechnical engineer, who will be present during all drilling operations. One copy of each field boring and well construction log, including color photographs of the rock core, if encountered, and groundwater data, will be submitted as part of the RI report. The RQD value shall be calculated for each 5-foot section. Information provided in the logs shall include, but not be limited to, the following:

- Date, test hole identification, and project identification;
- Name of individual developing the log;
- Name of driller and assistant(s);
- Drill, make and model, auger size;
- Identification of alternative drilling methods used and justification thereof (e.g., rotary drilling with a specific bit type to remove material from within the hollow stem augers);
- Standard penetration test (ASTM D-1586) blow counts;

- Field diagram of each monitoring well installed with the depth to bottom of screen, top of screen, and pack, bentonite seal, etc.;
- Reference elevation for all depth measurements;
- Depth of each change of stratum;
- Thickness of each stratum;
- Identification of the material of which each stratum is composed, according to the USCS system or standard rock nomenclature, as appropriate;
- Depth interval from which each sample was taken;
- Depth at which hole diameters (bit sizes) change;
- Depth at which groundwater is encountered;
- Depth to static water level and changes in static water level with well depth;
- Total depth of completed well;
- Depth or location of any loss of tools or equipment;
- Location of any fractures, joints, faults, cavities, or weathered zones;
- Depth of any grouting or sealing;
- Nominal hole diameters;
- Amount of cement used for grouting or sealing;
- Depth and type of well casing;
- Description of well screen (to include depth, length, location, diameter, slot sizes, material, and manufacturer);
- Any sealing-off of water-bearing strata;
- Static water level upon completion of the well and after development;
- Drilling date or dates;
- Construction details of well; and
- An explanation of any variations from the work plan.

8. Groundwater Sampling Procedures

The groundwater in all new monitoring wells will be allowed to stabilize for 7 days following development. Water levels will be measured to within 0.01 foot prior to purging and sampling. A temporary staff gauge or other surface water elevation measuring device will be established on any nearby surface water body, which may significantly influence groundwater movement. The surface elevation of these water bodies will be checked whenever groundwater elevations are measured. Sampling of each well will be accomplished in one of two ways.

Active Sampling:

Purging will be completed prior to active sampling. In general, wells will be purged until the pH, conductivity, temperature, and turbidity of the water being pumped from the well have stabilized. All wells will be purged of at least three well-bore volumes or to dryness. Groundwater samples will be collected via active methods (i.e., purging) according to the following procedures and in the volumes specified in Table 11-1:

- Water clarity will be quantified during sampling with a turbidity meter;
- When transferring water from the bailer or pump line to sample containers, care will be taken to avoid agitating the sample, since agitation promotes the loss of volatile constituents;
- Any observable physical characteristics of the groundwater (e.g., color, sheen, odor, turbidity) at the time of sampling will be recorded; and
- Weather conditions (i.e., air temperature, sky condition, recent heavy rainfall, drought

conditions) at the time of sampling will be recorded.

Passive Sampling:

Groundwater samples will be collected via passive methods (i.e., no-purge) according to the following procedures and in the volumes specified in Table 11-1:

- Samples will be collected via passive diffusion bag (PDB) samplers. PDB samplers are made of low-density polyethylene plastic tubing (typically 4 mil), filled with laboratory grade (ASTM Type II) deionized water and sealed at both ends.
- PDB samplers will only be used to collect groundwater samples which will be analyzed for VOCs.
- PDB samplers will be deployed by hanging in the well at the middle of the well screen unless a low water table, need to deploy multiple samplers or the targeting of a specific depth interval is identified. The PDB samplers will be deployed at least 14 days prior to sampling.
- The PDB samplers will be deployed using a Teflon® coated string or synthetic rope.
- When transferring water from the PDB to sample containers, care will be taken to avoid agitating the sample, since agitation promotes the loss of volatile constituents;
- Any observable physical characteristics of the groundwater (e.g., color, sheen, odor, turbidity) at the time of sampling will be recorded; and
- Weather conditions (i.e., air temperature, sky condition, recent heavy rainfall, drought conditions) at the time of sampling will be recorded.

All groundwater samples and their accompanying QA/QC samples will be run for volatile organic chemicals using NYSDEC Analytical Services Protocol (ASP; revised July 2005 and subsequent amendments or revisions).

9. Management of Investigative-Derived Waste

Purpose:

The purposes of these guidelines are to ensure the proper holding, storage, transportation, and disposal of materials that may contain hazardous wastes. Investigation-derived waste (IDW) included the following:

- Drill cuttings, discarded soil samples, drilling mud solids, and used sample containers;
- Well development and purge waters and discarded groundwater samples;
- Decontamination waters and associated solids;
- Soiled disposable personal protective equipment (PPE);
- Used disposable sampling equipment;
- Used plastic sheeting and aluminum foil;
- Other equipment or materials that either contain or have been in contact with potentially-impacted environmental media.
- Because these materials may contain regulated chemical constituents, they must be managed as a solid waste. This management may be terminated id characterization analytical results indicate the absence of these constituents.

Procedure:

1. Contain all investigation-derived wastes in Department of Transpiration (DOT)-approved 55-gallon drums, roll-off boxes, or other containers suitable for the wastes.

2. Contain wastes from separate borings or wells in separate containers (i.e. do not combine wastes from several borings/wells in a single container, unless it is a container used specifically for transfer purposes, or unless specific permission to do so has been provided by the LaBella Project Manager. Unused samples from surface sample locations within a given area may be combined.

3. To the extent practicable, separate solids from drilling muds, decontamination waters, and similar liquids. Place solids within separate containers.

4. Transfer all waste containers to a staging area. Access to this area will be controlled. Waste containers must be transferred to the staging area as soon as practicable after the generating activity is complete.

5. Pending transfer, all containers will be covered and secured when not immediately attended,

6. Label all containers with regard to contents, origin, and date of generation. Use indelible ink for all labeling.

7. Collect samples for waste characterization purposes, use boring/well sample analytical data for characterization.

8. For wastes determined to be hazardous in character, be aware on accumulation time limitations. Coordinate the disposal of these wastes with the Owner and NYSDEC.

9. Dispose of investigation-derived wastes as follows;

    - Soil, water, and other environmental media for which analysis does not detect organic constituents, and for which inorganic constituents are at levels consistent with background, may be spread on-site (pending NYSDEC approval) or otherwise treated as a non-waste material.
    - Soils, water, and other environmental media in which organic compounds are detected or metals are present above background will be disposed as industrial waste. Alternate disposition must be consistent with applicable State and Federal laws.
    - Personal protective equipment, disposable bailers, and similar equipment may be disposed as municipal waste, unless waste characterization results mandate disposal as industrial wastes

10. Decontamination

Sampling methods and equipment have been chosen to minimize decontamination requirements and to prevent the possibility of cross-contamination. Decontamination of equipment will be performed between discrete sampling locations. Equipment used to collect samples between composite sample locations will not require decontamination between collection of samples. All drilling equipment will be decontaminated prior to drilling, after drilling each monitoring well, and after the completion of all drilling. Special attention will be given to the drilling assembly, augers, and PVC casing and screens.

Drilling decontamination will consist of:

- Steam cleaning;
- Scrubbing with brushes, if soil remains on equipment; and
- Steam rinse.

Split spoons and other non-disposable equipment will be decontaminated between each sampling event. The sampler will be cleaned prior to each use, by one of the following procedures:

- Initially cleaned of all foreign matter;
- Sanitized with a steam cleaner;

OR

- Initially cleaned of all foreign matter;
- Scrubbed with brushes in alconox solution;
- Triple rinsed with deionized water; and
- Allowed to air dry.

11. Sample Containers

The volumes and containers required for the sampling activities are included in pre-washed sample containers will be ordered directly from a firm, which prepares the containers in accordance with EPA bottle washing procedures.

Table 11-1
Water Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Maximum Holding Time
Volatile Organics	40-ml glass vial with Teflon-backed septum	Two (2); fill completely, no air space	Cool to 4° C (ice in cooler), Hydrochloric acid to pH <2	7 days
Semivolatile Organics	1,000-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
Pesticides	1,000-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
PCBs	1,000-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
Metals	500-ml polyethylene	One (1); fill completely	Cool to 4° C (Nitric acid to pH <2	6 months

* Holding time is based on verified time of sample receipt at laboratory.

Note: All sample bottles will be prepared in accordance with USEPA bottle washing procedures. These procedures are incorporated in LaBella Associates Quality Control Procedures Manual, January, 1992

TABLE 11-2
Soil Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Maximum Holding Time
Volatile Organics, Semivolatile Organics, PCBs, and Pesticides	8-oz, glass jar with Teflon-lined cap	Two (2), fill as completely as possible	Cool to 4° C (ice in cooler)	7 days
RCRA Characterization	8-oz. glass jar with Teflon-lined cap	One (1); fill completely	Cool to 4° C (ice in cooler)	Must be extracted within 10 days; analyzed with 30 days

* Holding time is based on the times from verified time of sample receipt at the laboratory.

Note: All sample bottles will be prepared in accordance with USEPA bottle washing procedures. These procedures are incorporated in LaBella Associates Quality Control Procedures Manual, January, 1992.

TABLE 11-3
List of Major Instruments for Sampling and Analysis

- MSA 360 0_2 /Explosimeter
- Hollige Series 963 Nephlometer (turbidity meter)
- EM-31 Geomics Electromagnetic Induction Device
- pH/Temperature/Conductivity Meter - Portable
- Hewlett Packard (HP) 1000 computer with RTE-6 operating system; and HP 9144 computer with RTE-4 operating system equipped with Aquarius software for control and data acquisition from gas chromatograph/mass spectrometer (GC/MS) systems; combined wiley and National Bureau of Standards (NBS) mass spectral library; and data archiving on magnetic tape
- Viriam 6000 and 37000 gas chromatrographs equipped with flame ionization, electron capture, photoionization and wall detectors as appropriate for various analyses,, and interfaced to Variam DS604 or D5634 data systems for processing data.
- Spectra-Physics Model SP 4100 and SP 4270 and Variam 4270 cam puting integrators
- Perkin Eimer (PE) 3000% and 3030% fully Automated Atomic Absorption Spectrophotometers (AAS) with Furnace Atomizer and background correction system
- PE Plasma II Inductively Coupled Argon Plasma (ICAP) Spectre meter with PE7500 laboratory computer
- Dionex 20001 ion chromatograph with conductivity detector for anion analysis, with integrating recorder

12. Sample Custody

This section describes standard operating procedures for sample identification and chain-of-custody to be utilized for all Phase II field activities. The purpose of these procedures is to ensure that the quality of the samples is maintained during their collection, transportation, and storage through analysis. All chain-of-custody requirements comply with standard operating procedures indicated in EPA sample handling protocol.

Sample identification documents must be carefully prepared so that sample identification and chain-of-custody can be maintained and sample disposition controlled. Sample identification documents include:

- Field notebooks,
- Sample label,
- Custody seals, and
- Chain-of-custody records.

13. Chain-of-Custody

The primary objective of the chain-of-custody procedures is to provide an accurate written or computerized record that can be used to trace the possession and handling of a sample from collection to completion of all required analyses. A sample is in custody if it is:

- In someone's physical possession;
- In someone's view;
- Locked up; or
- Kept in a secured area that is restricted to authorized personnel.

13.1. Field Custody Procedures

- As few persons as possible should handle samples.
- Sample bottles will be obtained precleaned from a source such as I-Chem. Coolers or boxes containing cleaned bottles should be sealed with a custody tape seal during transport to the field or while in storage prior to use.
- The sample collector is personally responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under chain-of-custody rules.
- The sample collector will record sample data in the notebook.
- The site manager will determine whether proper custody procedures were followed during the fieldwork and decide if additional samples are required.

13.2. Sample Tags

Sample tags attached to or affixed around the sample container must be used to properly identify all samples collected in the field. The sample tags are to be placed on the bottles so as not to obscure any QA/QC lot numbers on the bottles; sample information must be printed in a legible manner using waterproof ink. Field identification must be sufficient to enable cross-reference with the logbook. For chain-of-custody purposes, all QA/QC samples are subject to exactly the same custodial procedures and documentation as "real" samples.

13.3. Transfer of Custody and Shipment

- The coolers in which the samples are packed must be accompanied by a chain-of-custody record. When transferring samples, the individuals relinquishing and receiving them must sign, date, and note the time on the chain-of-custody record. This record documents sample custody transfer.
- Shipping containers must be sealed with custody seals for shipment to the laboratory. The method of shipment, name of courier, and other pertinent information are entered in the "Remarks" section of the chain-of-custody record and traffic reports.
- All shipments must be accompanied by the chain-of-custody record identifying their contents. The original record accompanies the shipment. The other copies are distributed appropriately to the site manage.
- If sent by mail, the package is registered with return receipt requested. If sent by common carrier, a bill of lading is used. Freight bills, Postal Service receipts, and bill of lading are retained as part of the permanent documentation.

13.4. Chain-of-Custody Record

The chain-of-custody record must be fully completed in duplicate, using black carbon paper where possible, by the field technician who has been designated by the project manager as responsible for sample shipment to the appropriate laboratory for analysis. In addition, if samples are known to require rapid turnaround in the laboratory because of project time constraints or analytical concerns (e.g., extraction time or sample retention period limitations, etc.), the person completing the chain-of-custody record should note these constraints in the "Remarks" section of the record.

13.5. Laboratory Custody Procedures

A designated sample custodian accepts custody of the shipped samples and verifies that the sample identification number matches that on the chain-of-custody record and traffic reports, if required. Pertinent information as to shipment, pickup, and courier is entered in the "Remarks" section.

13.6. Custody Seals

Custody seals are preprinted adhesive-backed seals with security slots designed to break if the seals are disturbed. Sample shipping containers (coolers, cardboard boxes, etc., as appropriate) are sealed in as many places as necessary to ensure security. Seals must be signed and dated before use. On receipt at the laboratory, the custodian must check (and certify, by completing the package receipt log and LABMIS entries) that seals on boxes and bottles are intact. Strapping tape should be placed over the seals to ensure that seals are not accidentally broken during shipment.

14. Documentation

14.1. Sample Identification

All containers of samples collected from the project will be identified using the following format on a label or tag fixed to the sample container (labels are to be covered with Mylar tape):

XX-YY-O/D

- XX This set of initials indicates the specific Phase II sampling project
- YY These initials identify the sample location. Actual sample locations will be recorded in the task log.
- O/D An "O" designates an original sample; "D" identifies it as a duplicate.

Each sample will be labeled, chemically preserved, if required and sealed immediately after collection. To minimize handling of sample containers, labels will be filled out prior to sample collection. The sample label will be filled out using waterproof ink and will be firmly affixed to the sample containers and protected with Mylar tape. The sample label will give the following information:

- Name of sampler,
- Date and time of collection,
- Sample number,
- Analysis required,
- pH, and
- Preservation.

14.2. Daily Logs

Daily logs and data forms are necessary to provide sufficient data and observations to enable participants to reconstruct event that occurred during the project and to refresh the memory of the field personnel if called upon to give testimony during legal proceedings. All daily logs will be kept in a bound waterproof notebook containing numbered pages. All entries will be made in waterproof ink, dated, and signed. No pages will be removed for any reason. Corrections will be made according to the procedures given at the end of this section. The daily logs will include a site log and task log.

The site log is the responsibility of the site manager and will include a complete summary of the day's activity at the site.

The **Task Log** will include:

- Name of person making entry (signature).
- Names of team members on-site.
- Levels of personnel protection:
  - Level of protection originally used;
  - Changes in protection, if required; and
  - Reasons for changes
  - Time spent collecting samples.
- Documentation on samples taken, including:
  - Sampling location and depth station numbers;
  - Sampling date and time, sampling personnel;
  - Type of sample (grab, composite, etc.); and
  - Sample matrix.
- On-site measurement data.
- Field observations and remarks.
- Weather conditions, wind direction, etc.
- Unusual circumstances or difficulties.
- Initials of person recording the information.

15. Corrections to Documentation

15.1. Notebook

As with any data logbooks, no pages will be removed for any reason. If corrections are necessary, these must be made by drawing a single line through the original entry (so that the original entry can still be read) and writing the corrected entry alongside. The correction must be initialed and dated. Most corrected errors will require a footnote explaining the correction.

15.2. Sampling Forms

As previously stated, all sample identification tags, chain-of-custody records, and other forms must be written in waterproof ink. None of these documents are to be destroyed or thrown away, even if they are illegible or contain inaccuracies that require a replacement document.

If an error is made on a document assigned to one individual, that individual may make corrections simply by crossing a line through the error and entering the corrected information. The incorrect information should not be obliterated. Any subsequent error discovered on a document should be corrected by the person who made the entry. All corrections must be initialed and dated.

15.3. Photographs

Photographs will be taken as directed by the site manager. Documentation of a photograph is crucial to its validity as a representation of an existing situation. The following information will be noted in the task log concerning photographs:

- Date, time, location photograph was taken;
- Photographer (signature);
- Weather conditions;
- Description of photograph taken;
- Reasons why photograph was taken;
- Sequential number of the photograph and the film roll number; and
- Camera lens system used.

After the photographs have been developed, the information recorded in the field notebook should be transferred to the back of the photographs

16. Sample Handling, Packaging, and Shipping

The transportation and handling of samples must be accomplished in a manner that not only protects the integrity of the sample, but also prevents any detrimental effects due to the possible hazardous nature of samples. Regulations for packaging, marking, labeling, and shipping hazardous materials are promulgated by the United States Department of Transportation (DOT) in the Code of Federal Regulation, 49 CFR 171 through 177. All samples will be delivered to the laboratory with 24 to 48 hours from the day of collection.

All chain-of-custody requirements must comply with standard operating procedures in the EPA sample handling protocol. All sample control and chain-of-custody procedures applicable to the Consultant are presented in the Field Personnel Chain-of-Custody Documentation and Quality Control Procedures Manual, January 1992.

16.1. Sample Packaging

Samples must be packaged carefully to avoid breakage or contamination and must be shipped to the laboratory at proper temperatures. The following sample packaging requirements will be followed:

- Sample bottle lids must never be mixed. All sample lids must stay with the original containers.
- The sample volume level can be marked by placing the top of the label at the appropriate sample height, or with a grease pencil. This procedure will help the laboratory to determine if any leakage occurred during shipment. The label should not cover any bottle preparation QA/QC lot numbers.
- All sample bottles are placed in a plastic bag to minimize the potential for vermiculite contamination.
- Shipping coolers must be partially filled with packing materials and ice when required, to prevent the bottles from moving during shipment.
- The sample bottles must be placed in the cooler in such a way as to ensure that they do not touch one another.
- The environmental samples are to be cooled. The use of "blue ice" or some other artificial icing material is preferred. If necessary, ice may be used, provided that it is placed in plastic bags. Ice is not to be used as a substitute for packing materials.
- Any remaining space in the cooler should be filled with inert packing material. Under no circumstances should material such as sawdust, sand, etc., be used.
- A duplicate custody record and traffic reports, if required must be placed in a plastic bag and taped to the bottom of the cooler lid. Custody seals are affixed to the sample cooler.

16.2. Shipping Containers

Shipping containers are to be custody-sealed for shipment as appropriate. The container custody seal will consist of filament tape wrapped around the package at least twice and custody seals affixed in such a way that access to the container can be gained only by cutting the filament tape and breaking a seal.

Field personnel will make arrangements for transportation of samples to the lab. When custody is relinquished to a shipper, field personnel will telephone the lab custodian to inform him of the expected time of arrival of the sample shipment and to advise him of any time constraints on sample analysis. The lab must be notified as early in the week as possible, and in no case later than 3 p.m. (EST) on Thursday, regarding samples intended for Saturday delivery.

16.3. Marking and Labeling

- Use abbreviations only where specified.
- The words "This End Up" or "This Side Up" must be clearly printed on the top of the outer package. Upward pointing arrows should be placed on the sides of the package. The words "Laboratory Samples" should also be printed on the top of the package.
- After a sample container has been sealed, two chain-of-custody seals are placed on the container, one on the front and one on the back. The seals are protected from accidental

damage by placing strapping tape over then.

- If samples are designated as medium or high hazard, they must be sealed in metal paint cans, placed in the cooler with vermiculite and labeled and placarded in accordance with DOT regulations.
- In addition, the coolers must also be labeled and placarded in accordance with DOT regulations if shipping medium and high hazard samples.

17. Calibration Procedures and Frequency

All instruments and equipment used during sampling and analysis will be operated, calibrated, and maintained according to the manufacturer's guidelines and recommendations as well as criteria set forth in the applicable analytical methodology references. Operation, calibration, and maintenance will be performed by personnel properly trained in these procedures. Documentation of all routine and special maintenance and calibration information will be maintained in an appropriate logbook or reference file, and will be available on request. Section 7 lists the major instruments to be used for sampling and analysis. Brief descriptions of calibration procedures for major field and laboratory instruments follow.

18. Field Instrumentation

18.1. Photovac/MiniRae Photoionization Detector (PID)

Standard operating procedures for the PID require that routine maintenance and calibration be performed every six months. Field calibration will be performed on a daily basis. The packages used for calibration are non-toxic analyzed gas mixtures available in pressurized containers.

18.2. Organic Vapor Analyzer

Organic vapor analyzers (OVAs) are calibrated and routine maintenance performed every six months when the units are not in use. Calibration is performed and the major system checks are performed prior to the instrument being released for field use.

Calibration of the OVA 128 GC must be performed by a factory-authorized service representative. The instrument is removed from its protective case and the probe is connected to the base unit. After checking for an airtight seal in the sample line (plugging the sample inlet to stop the pump), the hydrogen supply is turned on and the pressure is set to 10 psi. The electronics are turned on and the instrument is allowed to warm up for at least 5 minutes. After warm up, the instrument is zeroed on the "X10" scale using the adjust knob. The flame is then lit and a gas-tight sample bag is filled with a mixture of 100 ppm methane in air. The sample bag is then attached to the probe inlet and the internal pump is allowed to draw in as much sample as is needed. R32 on the control board is adjusted to read 100 ppm on the "X10" scale and then the hydrogen supply is shut down. The pump can now be turned off and the sample bag removed. Using the adjust knob, the meter is set to read 4 ppm on the "X1" scale. Switching back to the "X10" scale the adjust knob is again used to set the meter to 40 ppm. The scale is then set to "X100" and R33 is adjusted until the meter reads 40 ppm on the "X100" scale.

The OVA has a detection limit of 0.1 ppm in methane equivalents and a working range of 0 to 1,000 ppm. During daily field use, system checks are performed which involve calibration and maintenance of the pump systems, gases, and filters. Care is taken to check for and prevent clogging or leaks. Quad rings and the burner chamber are examined on a weekly basis. Routine biannual maintenance includes a

thorough cleaning as well as a re-examination of the pump system for leaks and wear. Parts are replaced as necessary. Instrument operation is verified by calibrating and running the OVA for 4 to 6 hours. An instrument specific logbook is maintained with the OVA to document its use and maintenance.

18.3. Conductance, Temperature, and pH Tester

Temperature and conductance instruments are factory calibrated. Temperature accuracy can be checked against an NBS certified thermometer prior to field use if necessary. Conductance accuracy may be checked with a solution of known conductance and recalibration can be instituted, if necessary.

To recalibrate conductance, remove the black plug revealing the adjustment potentiometer screw. Add standard solution to cup, discard and refill. Repeat procedure until the digital display indicates the same value twice in a row. Adjust the potentiometer until the digital display indicates the known value of conductance. To increase the digital display reading, turn the adjustment potentiometer screw counter-clockwise (clockwise to decrease).

To standardize the pH electrode and meter, place the pH electrode in the 7.0 buffer bottle. Adjust the "ZERO" potentiometer on the face of the tester so that the digital display indicates 7.00.

Then place the pH electrode in the 4.0 or 10.0 buffer bottle (depending on where you expect the actual measurement to be). Adjust the "SLOPE" potentiometer on the face of the tester so that the digital display indicates the value of the buffer chosen.

Note: There is interaction between the "ZERO" and "SLOPE" adjustments, so the procedure should be repeated several times.

Do not subject the pH electrode to freezing temperatures.

It is good practice to rinse the electrode in distilled water when going from one buffer to another. When not in use the cap should be kept on the electrode. Keeping the cotton in the cap moist will keep the electrode ready to use. Moisten the cotton frequently (once a week, usually).

18.4. 0_2/Explosimeter

The primary maintenance item of the Model 260 is the rechargeable 2.4 volt (V) nickel cadmium battery. The battery is recharged by removing the screw cap covering receptacle and connecting one end of the charging cable to the instrument and the other end to a 115V AC outlet.

The battery can also be recharged using a 12V DC source. An accessory battery charging cable is available, one end of which plugs into the Model 260 while the other end is fitted with an automobile cigarette lighter plug.

Recommended charging time is 16 hours.

Before the calibration of the combustible gas indicator can be checked, the Model 260 must be in operating condition. Calibration check-adjustment is made as follows:

1. Attach the flow control to the recommended calibration gas tank.
2. Connect the adapter-hose to the flow control.
3. Open flow control valve.

4. Connect the adapter-hose fitting to the inlet of the instrument; after about 15 seconds the LEL meter pointer should be stable and within the range specified on the calibration sheet accompanying the calibration equipment. If the meter pointer is not in the correct range, stop the flow; remove the right hand side cover. Turn on the flow and adjust the "S" control with a small screwdriver to obtain a reading as specified on the calibration sheet.
5. Disconnect the adapter-hose fitting from the instrument.
6. Close the flow control valve.
7. Remove the adapter-hose from the flow control.
8. Remove the flow control from the calibration gas tank.
9. Replace the side cover on the Model 260.

CAUTION: Calibration gas tank contents are under pressure. Use no oil, grease, or flammable solvents on the flow control or the calibration gas tank. Do not store calibration gas tank near heat or fire or in rooms used for habitation. Do not throw in fire, incinerate, or puncture. Keep out of reach of children. It is illegal and hazardous to refill this tank. Do not attach the calibration gas tank to any other apparatus than described above. Do not attach any gas tank other than MSA calibration tanks to the regulator.

18.5. Nephelometer (Turbidity Meter)

The Series 95 nephelometer is calibrated before each use. Allow the instrument to warm up for approximately 2 hours. Using turbidity-free deionized water, zero the meter. Set the scale to 100, fill with a 40 NTU standard (AEPA-1 turbidity standard from Advanced Polymer Systems, Inc.), and insert into the instrument. Adjust the standardize control to give a readout of 200. Re-zero the instrument and repeat these steps with the scale set at 10 and 1 using 4.0 and 0.4 NTU standards, respectively. These standards are prepared by diluting aliquots of the 40 NTU standard.

19. Internal Quality Control Checks

QA/QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of field equipment. Field-based QA/QC will comprise at least 10% of each data set generated and will consist of standards, replicates, spikes, and blanks. Field duplicates and field blanks will be analyzed by the laboratory as samples and will not necessarily be identified to the laboratory as duplicates or blanks. For each matrix, field duplicates will be provided at a rate of one per 10 samples collected or one per shipment, whichever is greater. Field blanks which consist of trip, routine field, and rinsate blanks will be provided at a rate of one per 20 samples collected for each parameter group, or one per shipment, whichever is greater.

Calculations will be performed for recoveries and standard deviations along with review of retention times, response factors, chromatograms, calibration, tuning, and all other QA/QC information generated. All QC data, including split samples, will be documented in the site logbook. QA/QC records will be retained and results reported with sample data.

19.1. Blank Samples

Blank samples are analyzed in order to assess possible contamination from the field and/or laboratory so that corrective measures may be taken, if necessary. Field samples are discussed in the following subsection:

19.2. Field Blanks

Various types of blanks are used to check the cleanliness of field handling methods. The following types of blanks may be used: the trip blank, the routine field blank, and the field equipment blank. They are analyzed in the laboratory as samples, and their purpose is to assess the sampling and transport procedures as possible sources of sample contamination. Field staff may add blanks if field circumstances are such that they consider normal procedures are not sufficient to prevent or control sample contamination, or at the direction of the project manager. Rigorous documentation of all blanks in the site logbooks is mandatory.

- **Routine Field Blanks** or bottle blanks are blank samples prepared in the field to access ambient field conditions. They will be prepared by filling empty sample containers with deionized water and any necessary preservatives. They will be handled like a sample and shipped to the laboratory for analysis.
- **Trip Blanks** are similar to routine field blanks with the exception that they are **not** exposed to field conditions. Their analytical results give the overall level of contamination from everything except ambient field conditions. For the RI/FS, one trip blank will be collected with every batch of water samples for volatile organic analysis. Each trip blank will be prepared by filling a 40-ml vial with deionized water prior to the sampling trip, transported to the site, handled like a sample, and returned to the laboratory for analysis without being opened in the field.
- **Field Equipment Blanks** are blank samples (sometimes called transfer blanks or rinsate blanks) designed to demonstrate that sampling equipment has been properly prepared and cleaned before field use, and that cleaning procedures between samples are sufficient to minimize cross contamination. If a sampling team is familiar with a particular site, they may be able to predict which areas or samples are likely to have the highest concentration of contaminants. Unless other constraints apply, these samples should be taken last to avoid excessive contamination of sampling equipment.

19.3. Field Duplicates

Field duplicate samples consist of a set of two samples collected independently at a sampling location during a single sampling event. In some instances the field duplicate can be a blind duplicate, i.e., indistinguishable from other analytical samples so that personnel performing the analyses are not able to determine which samples are field duplicates. Field duplicates are designed to assess the consistency of the overall sampling and analytical system.

19.4. Quality Control Check Samples

Inorganic and organic control check samples are available from EPA free of charge and are used as a means of evaluating analytical techniques of the analyst. Control check samples are subjected to the entire sample procedure, including extraction, digestion, etc., as appropriate for the analytical method utilized.

QA/QC samples will be submitted for the complete data set generated as part of the RAWP. The QA/QC Sampling Plan presented in the table below outlines the protocol for QA/QC sample collected and submission.

TABLE 11-4
QA/QC Sampling Plan

Trip Blanks	Field Blanks	Method Blanks	MS/MSD
1 per 20 samples, or one per shipment	1 per 20 samples, or one per shipment	1 per 20 samples, or one per shipment	1 per 20 samples, or one per shipment

A Data Usability Summary Report (DUSR) will be completed on the sampling included as part of the Final Engineering Report.

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APPENDIX K

Responsibilities of Owner and Remedial Party

APPENDIX K

RESPONSIBILITIES of

OWNER and REMEDIAL PARTY

Responsibilities

The responsibilities for implementing the Site Management Plan ("SMP") for the Lake Ontario Mariner's Marina site (the "site"), number V00585, are divided between the site owner(s) and a Remedial Party, as defined below. The owner(s) is/are currently listed as:

Jeffrey Cohen ("owner")
5201 Hoag Lane
Fayetteville, New York 13066

Solely for the purposes of this document and based upon the facts related to a particular site and the remedial program being carried out, the term Remedial Party ("RP") refers to any of the following: certificate of completion holder, volunteer, applicant, responsible party, and, in the event the New York State Department of Environmental Conservation ("NYSDEC") is carrying out remediation or site management, the NYSDEC and/or an agent acting on its behalf. The RP is:

The Upstate National Bank
One West Main Street
Rochester, New York 14614

Nothing on this page shall supersede the provisions of an Environmental Easement, Consent Order, Consent Decree, agreement, or other legally binding document that affects rights and obligations relating to the site.

Site Owner's Responsibilities:

1) The owner shall follow the provisions of the SMP as they relate to future construction and excavation at the site.

2) In accordance with a periodic time frame determined by the NYSDEC, the owner shall periodically certify, in writing, that all Institutional Controls set forth in a Deed Restriction remain in place and continue to be complied with. The owner shall provide a written certification to the RP, upon the RP's request, in order to allow the RP to include the certification in the site's Periodic Review Report (PRR) certification to the NYSDEC.

3) In the event the site is delisted, the owner remains bound by the Deed Restriction and shall submit, upon request by the NYSDEC, a written certification that the Deed Restriction is still in place and has been complied with.

4) The owner shall grant access to the site to the RP and the NYSDEC and its agents for the purposes of performing activities required under the SMP and assuring compliance with the SMP.

5) The owner is responsible for assuring the security of the remedial components located on its property to the best of its ability. In the event that damage to the remedial components or vandalism is evident, the owner shall notify the site's RP and NYSDEC in accordance with the timeframes indicated in Section 2.4.2 - Notifications.

6) In the event some action or inaction by the owner adversely impacts the site, the owner must notify the site's RP and the NYSDEC in accordance with the time frame indicated in [Section 2.4.2]-Notifications and (ii) coordinate the performance of necessary corrective actions with the RP.

7) The owner must notify the RP and the NYSDEC of any change in ownership of the site property (identifying the tax map numbers in any correspondence) and provide contact information for the new owner of the site property. 6 NYCRR contains notification requirements applicable to any construction or activity changes and changes in ownership. Among the notification requirements is the following: Sixty days prior written notification must be made to the NYSDEC. Notification is to be submitted to the NYSDEC Division of Environmental Remediation's Site Control Section. Notification requirements for a change in use are detailed in Section 2.4 of the SMP. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.

8) The owner will allow the installed systems to continue operating on behalf of the RP. The RP remains ultimately responsible for maintaining the engineering controls.

9) Until such time as the NYSDEC deems the SSD system or AS/SVE system unnecessary, the owner shall operate the system, and report any maintenance issues to the RP and the NYSDEC.

10) In accordance with the tenant notification law, within 15 days of receipt, the owner must supply a copy of any vapor intrusion data that is produced with respect to structures and that exceeds NYSDOH or OSHA guidelines on the site, whether produced by the NYSDEC, RP, or owner, to the tenants on the property. The owner must otherwise comply with the tenant and occupant notification provisions of Environmental Conservation Law Article 27, Title 24.

Remedial Party Responsibilities

1) The RP must follow the SMP provisions regarding any construction and/or excavation it undertakes at the site.

2) The RP shall report to the NYSDEC all activities required for remediation, operation, maintenance, monitoring, and reporting. Such reporting includes, but is not limited to, periodic review reports and certifications, electronic data deliverables, corrective action work plans and reports, and updated SMPs.

3) Before accessing the site property to undertake a specific activity, the RP shall provide the owner advance notification that shall include an explanation of the work expected to be completed. The RP shall provide to (i) the owner, upon the owner's request, (ii) the NYSDEC, and (iii) other entities, if required by the SMP, a copy of any data generated during the site visit and/or any final report produced.

4) If the NYSDEC determines that an update of the SMP is necessary, the RP shall update the SMP and obtain final approval from the NYSDEC. Within 5 business days after NYSDEC approval, the RP shall submit a copy of the approved SMP to the owner.

5) The RP shall notify the NYSDEC and the owner of any changes in RP ownership and/or control and of any changes in the party/entity responsible for the operation, maintenance, and monitoring of and reporting with respect to any remedial system (Engineering Controls). The RP shall provide contact information for the new party/entity. Such activity constitutes a Change of Use pursuant to 375-

1.11(d) and requires 60-days prior notice to the NYSDEC. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html .

6) The RP shall notify the NYSDEC of any damage to or modification of the systems as required under Section 2.4.2 - Notifications of the SMP.

7) The RP is responsible for the proper maintenance of any installed vapor intrusion mitigation systems associated with the site, as required in Section 4.0 of the SMP.

8) Prior to a change in use that impacts the remedial system or requirements and/or responsibilities for implementing the SMP, the RP shall submit to the NYSDEC for approval an amended SMP.

9) Any change in use, change in ownership, change in site classification (*e.g.*, delisting), reduction or expansion of remediation, and other significant changes related to the site may result in a change in responsibilities and, therefore, necessitate an update to the SMP and/or updated legal documents. The RP shall contact the Department to discuss the need to update such documents.

Change in RP ownership and/or control and/or site ownership does not affect the RP's obligations with respect to the site unless a legally binding document executed by the NYSDEC releases the RP of its obligations.

Future site owners and RPs and their successors and assigns are required to carry out the activities set forth above.

APPENDIX L

Deed Restriction

JEFFERSON COUNTY - STATE OF NEW YORK

GIZELLE J. MEEKS, JEFFERSON COUNTY CLERK
175 ARSENAL STREET
WATERTOWN, NEW YORK 13601

COUNTY CLERK'S RECORDING PAGE
*****THIS PAGE IS PART OF THE DOCUMENT – DO NOT DETACH*****

INSTRUMENT #: 2018-00005959

Receipt#: 2018009009
Clerk: LV
Rec Date: 05/02/2018 01:00:55 PM
Doc Grp: DEE
Descrip: DECLARATION OF RESTRICTION
Num Pgs: 9
Rec'd Frm: BARCLAY DAMON

Party1: HENDERSON HARBOR MARINERS MARINA INC
Party2: DECLARATION OF COVENANTS AND RESTRICTIONS
Town: HENDERSON

Recording:	
Cover Page	5.00
Recording Fee	60.00
Cultural Ed	14.25
Records Management - Coun	1.00
Records Management - Stat	4.75
TP584	5.00
Sub Total:	90.00
Transfer Tax	
Transfer Tax - State	0.00
Sub Total:	0.00
Total:	90.00

****** NOTICE: THIS IS NOT A BILL ******

***** Transfer Tax *****
Transfer Tax #: 3010
Transfer Tax Consideration: 0.00

Total: 0.00

WARNING***
***Information may change during the verification process and may not be reflected on this page

Gizelle J. Meeks
Jefferson County Clerk

Record and Return To:

BARCLAY DAMON
100 CHESTNUT ST
STE 2000
ROCHESTER NY 14604-9959

DECLARATION of COVENANTS and RESTRICTIONS

THIS COVENANT is made the 27 day of March, 2018, by Henderson Harbor Mariners' Marina, Inc., d/b/a Lake Ontario Mariner's Marina, a New York corporation having an office for the transaction of business at 5201 Hoag Lane, Fayetteville, New York 13066.

WHEREAS, the Henderson Harbor Mariners' Marina, Inc. Site, NYSDEC Site No.: V00585, is the subject of a Voluntary Cleanup Agreement, Index No. A4-0463-0602 ("VCA"), executed by The Upstate National Bank ("Bank") as part of the New York State Department of Environmental Conservation's (the "Department's") Voluntary Cleanup Program, namely that parcel of real property located on 12548 Eastman Tract in the Town of Henderson, County of Jefferson, State of New York, being more particularly described in Schedule "A," attached to this declaration and made a part hereof, and hereinafter referred to as "the Site," being a part of that property conveyed to Henderson Harbor Mariners' Marina, Inc. by IFS-Lisbon Asset Advisory Services, LLC by deed(s) dated March 28, 2002 and recorded on April 19, 2002 in the Jefferson County Clerk's Office in Liber 1851 at page 270, and hereinafter referred to as "the Property"; and

WHEREAS, the Department approved a remedy to eliminate or mitigate all significant threats to the environment presented by the contamination disposed at the Site and such remedy requires that a portion of the Site, being more particularly described in Schedule "B," attached to this declaration and made a part hereof, and hereinafter referred to as "the Controlled Property," be subject to this Declaration of Covenants and Restrictions.

NOW, THEREFORE, Henderson Harbor Mariners' Marina, Inc., for itself and its successors and/or assigns, covenants that:

First, the Controlled Property subject to this Declaration of Covenants and Restrictions is as shown on a map attached to this declaration as Schedule "C" and made a part hereof.

Second, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, where contamination remains at the Controlled Property subject to the provisions of the Site Management Plan ("SMP"), there shall be no construction, use or occupancy of the Controlled Property that results in the disturbance or excavation of the Controlled Property which threatens the integrity of the engineering controls or which results in unacceptable human exposure to contaminated soils. The SMP may be obtained from the New York State Department of Environmental Conservation, Division of Environmental

Record & Return to:
Att: Kathy Brown

BARCLAY DAMON, LLP
2000 FIVE STAR BANK PLAZA
100 CHESTNUT STREET
ROCHESTER, NY 14604

Remediation, Site Control Section, 625 Broadway, Albany, NY 12233.

Third, the owner of the Controlled Property shall not disturb, remove, or otherwise interfere with the installation, use, operation, and maintenance of engineering controls required for the Remedy, which are described in the SMP, unless in each instance the owner first obtains a written waiver of such prohibition from the Department or Relevant Agency.

Fourth, the owner of the Controlled Property shall prohibit the Controlled Property from ever being used for purposes other than for Commercial Use as defined at 6 NYCRR 375-1.8(g)(2)(iii) or Industrial Use as defined at 6 NYCRR 375-1.8(g)(2)(iv) without the express written waiver of such prohibition by the Department or Relevant Agency.

Fifth, the use of groundwater underlying the Controlled Property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Jefferson County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department or Relevant Agency.

Sixth, the Bank or owner of the Controlled Property shall provide a periodic certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department or Relevant Agency, which will certify that the institutional and engineering controls put in place are unchanged from the previous certification, comply with the SMP, and have not been impaired.

Seventh, the owner of the Controlled Property shall continue in full force and effect any institutional and engineering controls required for the Remedy and the Bank or owner of the Controlled Property shall maintain such controls, unless the Bank or owner first obtains permission to discontinue such controls from the Department or Relevant Agency, in compliance with the approved SMP, which is incorporated and made enforceable hereto, subject to modifications as approved by the Department or Relevant Agency.

Eighth, this Declaration is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Controlled Property, and shall provide that the owner and its successors and assigns consent to enforcement by the Department or Relevant Agency of the prohibitions and restrictions that the VCA requires to be recorded, and hereby covenant not to contest the authority of the Department or Relevant Agency to seek enforcement.

Ninth, any deed of conveyance of the Controlled Property, or any portion thereof, shall recite, unless the Department or Relevant Agency has consented to the termination of such covenants and restrictions, that said conveyance is subject to this Declaration of Covenants and

Restrictions.

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

HENDERSON HARBOR MARINERS' MARINA, INC.

By: Marla Cohen

Print Name: MARLA COHEN

Title: President

Date: March 27, 2018

Grantor's Acknowledgment

STATE OF NEW YORK)

) s.s.:

COUNTY OF ONONDAGA)

On the day 27 of March, in the year 2018, before me, the undersigned, personally appeared Marla Cohen, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

SHANE M BUZZARD
Notary Public - State of New York
NO. 01BU6258069
Qualified in Onondaga County
My Commission Expires Mar 19, 2020

Notary Public State of New York

[06/14]

Schedule "A"

Description of the portion of the Henderson Harbor Mariners' Marina Property
(a portion of Tax Map No. 105.12-1-14.22),
which is subject to the
Voluntary Cleanup Agreement, Index No. A4-0463-0602,
between
The Upstate National Bank
and
the New York State Department of Environmental Conservation

METES AND BOUNDS DESCRIPTION
OF AMENDED VCA PROPERTY SITE NO V00585

Beginning at a point in the easterly boundary of lands now or formerly of Henderson Harbor Mariners' Marian Inc., said point being S 35° 51' 01" W, as measured along said easterly boundary a distance of 41.36 feet from the southerly boundary of lands now or formerly of Francis McLeod and Susan McLeod, said point also being a corner of a sheet pile wall; thence

1) S 35° 51' 01" W along the face of said sheet pile wall a distance of 114.59 feet to an angle point in said wall; thence

2) N 55° 17' 42" W continuing along said sheet pile wall a distance of 48.41 feet to a point on the westerly face of an existing wood dock; thence

3) S 35° 51' 26" W along the westerly face of said wood dock a distance of 70.15 feet to a point; thence

4) N 56° 04' 41" W through the lands now or formerly of Henderson Harbor Mariners' Marina Inc. a distance of 38.75 feet to a point, said point being the corner of an existing sheet pile wall; thence

Along the face of said existing sheet pile wall the following courses and distances

5) N 37° 33' 42" E a distance of 6.53 feet to a point; thence

6) N 31° 32' 31" E a distance of 21.57 feet to a point; thence

7) N 35° 02' 10" E a distance of 18.23 feet to a point; thence

8) N 41° 52' 38" E a distance of 22.37 feet to a point; thence

9) N 37° 00' 58" E a distance of 58.87 feet to a point; thence

10) N 41° 38' 21" E a distance of 19.62 feet to a point; thence

11) S 65° 58' 52" E a distance of 11.87 feet to a point; thence

12) S 83° 51' 47" E a distance of 5.67 feet to a point; thence

13) N 35° 48' 30" E a distance of 35.06 feet to a point; thence

14) S 53°59' 51" E a distance of 66.78 feet to the POINT OF BEGINNING.

The above described parcel contains 0.274 acres (11932 sq. ft.) more or less. All as shown on a plan by LaBella Associates PC titled "DECLARATION OF COVENANTS AND RESTRICTIONS CONTROLLED PROPERTY" dated September, 2012.

Schedule "B"

Metes and Bounds Description of the Site
Being and Intending to be the "Controlled Property" which is Subject to this Declaration of Covenants and Restrictions

METES AND BOUNDS DESCRIPTION OF

DECLARATION OF COVENANTS AND

RESTRICTIONS CONTROLLED PROPERTY SITE No V00585

Beginning at a point in the easterly boundary of lands now or formerly of Henderson Harbor Mariners' Marina Inc., said point being S 35° 51' 01" W, as measured along said easterly boundary a distance of 41.36 feet from the southerly boundary of lands now or formerly of Francis McLeod and Susan McLeod, said point also being a corner of a sheet pile wall;

1) S 35° 51' 01" W along the face of said sheet pile wall a distance of 114.59 feet to an angle point in said wall; thence

2) N 55° 17' 42" W continuing along said sheet pile wall and a projection of said wall a distance of 86.45 feet to a point said point being on the face of an existing sheet pile wall; thence

Along the face of said existing sheet pile wall the following courses and distances.

3) N 37° 00' 58" E a distance of 56.68 feet to a point; thence

4) N 41° 38' 21" E a distance of 19.62 feet to a point; thence

5) S 65° 58' 52" E a distance of 11.87 feet to a point; thence

6) S 83° 51' 47" E a distance of 5.67 feet to a point; thence

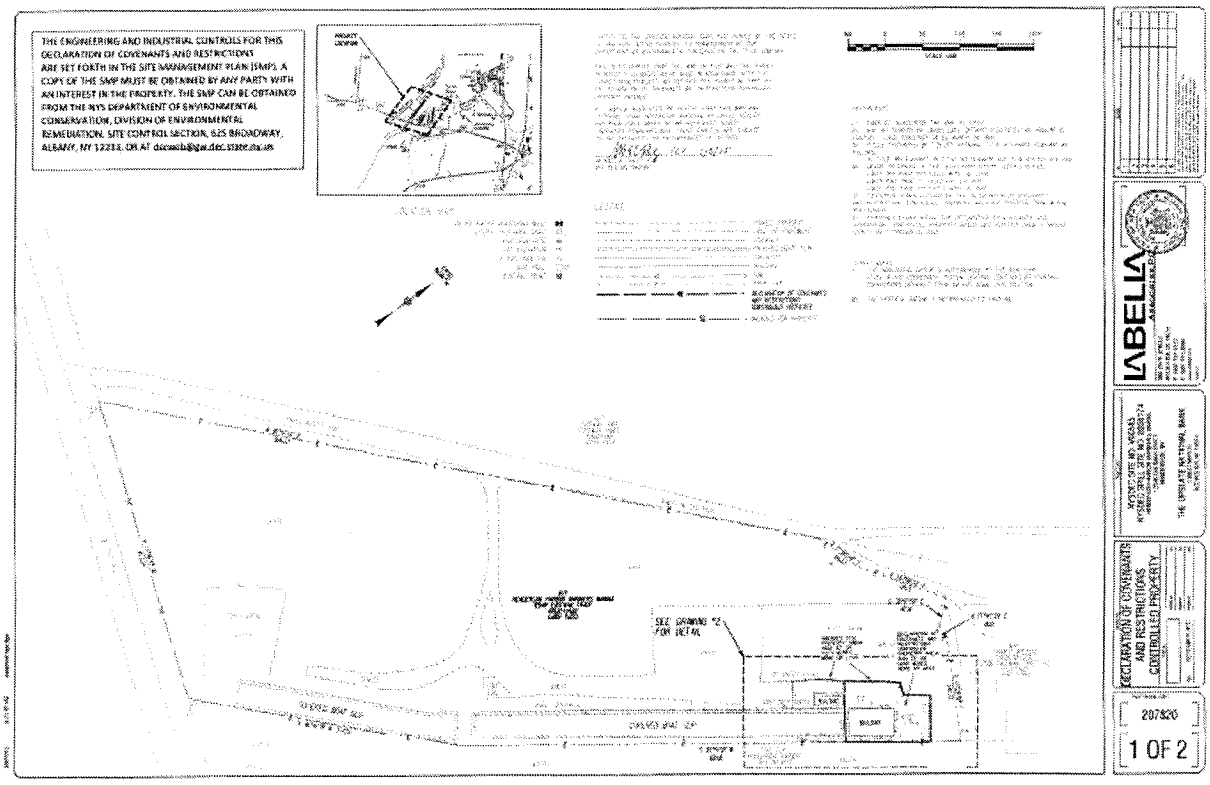
7) N 35° 48' 30" E a distance of 35.06 feet to a point; thence

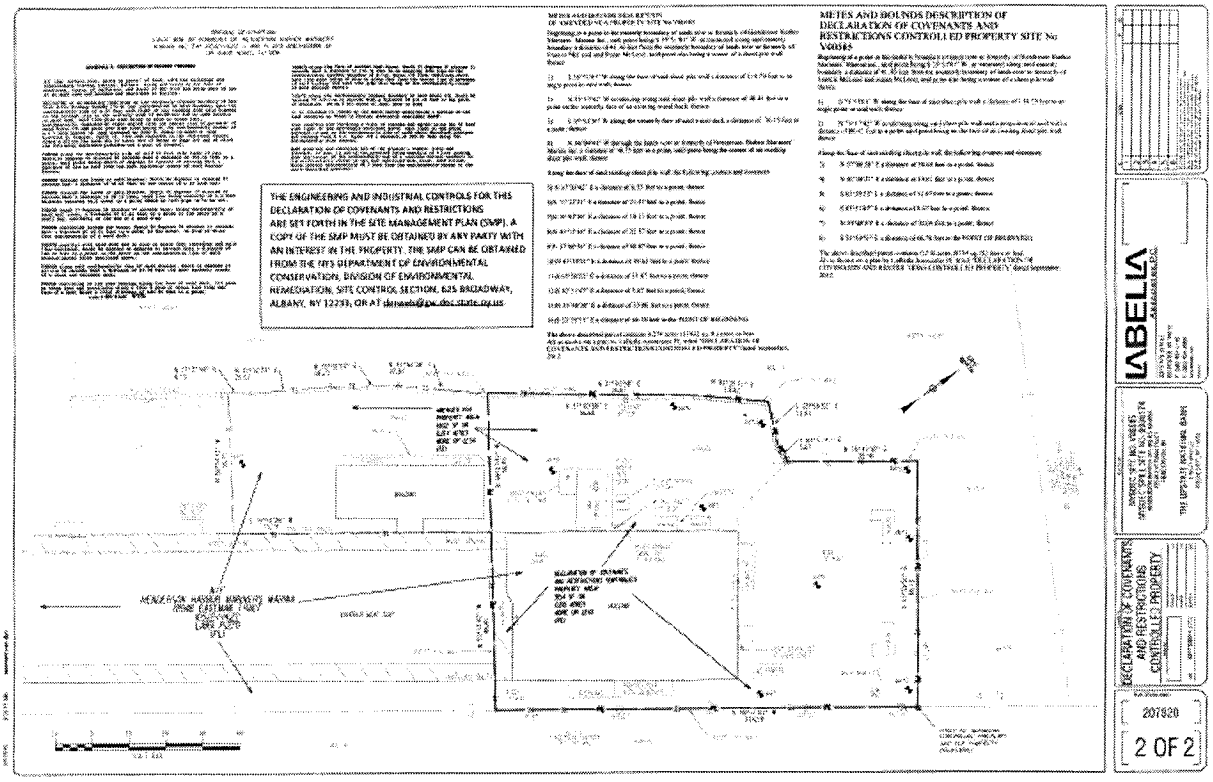
8) S 53° 59' 51" E a distance of 66.78 feet to the POINT OF BEGINNING.

The above described parcel contains 0.210 acres (9154 sq. ft.) more or less. All as shown on a plan by LaBella Associates PC titled "DECLARATION OF COVENANTS AND RESTRICTIONS CONTROLLED PROPERTY" dated September, 2012.

Schedule "C"

Plan entitled "Declaration of Covenants and Restrictions Controlled Property"
LaBella Associates PC
September 2012




METES AND BOUNDS DESCRIPTION OF
DECLARATION OF COVENANTS AND
RESTRICTIONS CONTROLLED PROPERTY SITE No
V00185
THE ENGINEERING AND INDUSTRIAL CONTROLS FOR THIS DECLARATION OF COVENANTS AND RESTRICTIONS ARE SET FORTH IN THE SITE MANAGEMENT PLAN (SMP). A COPY OF THE SMP MUST BE OBTAINED BY ANY PARTY WITH AN INTEREST IN THE PROPERTY. THE SMP CAN BE OBTAINED FROM THE NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DIVISION OF ENVIRONMENTAL REMEDIATION, SITE CONTROL SECTION, 625 BROADWAY, ALBANY, NY 12233, OR AT
LABELLA
DECLARATION OF COVENANTS AND RESTRICTIONS CONTROLLED PROPERTY
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