TIME 1-HOUR CLEANERS
CONSTRUCTION COMPLETION REPORT

NIAGARA FALLS, NIAGARA COUNTY, NEW YORK

NYSDEC SITE NUMBER: #932158

Prepared For:



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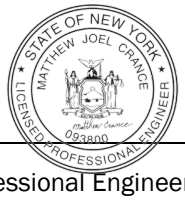


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FEBRUARY 2025

CERTIFICATIONS

I, Matthew Joel Crance, am currently a registered professional engineer licensed by the State of New York, I had primary direct responsibility for implementation of the remedial program activities, and I certify that the Interim Remedial Measure was implemented and that all construction activities were completed in substantial conformance with the Department-approved Interim Remedial Measures.



NYS Professional Engineer #093800	Date	Signature
	2/14/2025	Matthew Crance

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LIST OF ACRONYMS

Acronym	Definition
APU	Air Purifying Unit
CCR	Construction Completion Report
DCE	cis-1,2-dichloroethene
FS	Feasibility Study
GAC	granular activated carbon
HEPA	high-efficiency particulate air
IRM	interim remedial measure
NES	National Environmental Systems
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	Department of Transportation
OM&M	monitoring, and maintenance
PCE	tetrachloroethylene
PID	photoionization detector
PVC	polyvinyl chloride
PVE	passive vapor extraction
RI	Remedial Investigation
Site	Time 1-Hour Cleaners
SSDS	sub-slab depressurization system
SVE	soil vapor extraction
SVI	soil vapor intrusion
TCE	trichloroethene
VOC	volatile organic compound
VOCs	volatile organic compounds

SECTION 1 INTRODUCTION

Time 1-Hour Cleaners (Site), Site Number 932158, is a Class 2 inactive hazardous waste disposal site within the New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program). Remedial Investigation activities and Interim Remedial Measures (IRM) as described in Sections 2 and 3 have been completed at the Site. The site is currently zoned for mixed residential and commercial use. Site location is shown on (**Figure 1**).

1.1 Physical Setting

The Site is approximately 0.24 acres and is located at 2526 and 2532 Pine Avenue in Niagara Falls, Niagara County, New York. Both parcels are primarily occupied by the footprint of two structures. Parking areas located on the north side of both properties were originally unpaved, however the 2532 Pine Avenue parking area was paved in Fall of 2021 while 2526 Pine Avenue remains unpaved as of the last site visit (**Figure 2**). Site properties are described below:

- 2526 Pine Avenue (Time 1-Hour Cleaners) is a 4,143-square-foot two-story structure that includes a store front that previously housed a dry cleaning business on the first floor and three apartment units on the second floor
- 2532 Pine Avenue (DiLaura DDS) includes a 3,012-square-foot two-story structure that includes a dental office on the first floor and one residential apartment on the second floor

The Site is located in a densely populated commercial and residential area of the City of Niagara Falls. The Site is bordered to the north by a residential area, to the west by commercial and residential properties, to the east by a commercial building (at 2602 Pine Avenue) and to the south by Pine Avenue.

The Site is situated at a ground surface elevation of approximately 575 feet above mean sea level. Site topography is relatively flat, and the greater area slopes gently to the east/southeast toward Gill Creek.

No water supply wells have been identified immediately downgradient of the Site. The nearest water supply well identified during the remedial investigation is located at approximately 2 miles southeast of the Site, cross-gradient of the inferred groundwater flow direction. No wetlands exist on or adjacent to the Site based on New York State and federal wetland mapping.

1.2 Site History

Dry cleaning operations began at the 2532 Pine Avenue property during, or prior to, 1969 and continued at that location until 1982. Beginning in 1982, Time 1-Hour Cleaners relocated to the adjacent property at 2526 Pine Avenue. Dry cleaning operations continued at 2526 Pine Avenue until 1988, at which point dry cleaning equipment was removed and on-site services were limited to garment pressing and drop off/pickup (no active dry cleaning). The 2526 Pine Avenue property was sold on June 14, 2021 to the Rahima Aziz Foundation. The building is currently unoccupied. This Construction Completion Report is specific to the Soil Vapor Extraction System installed at the 2532 Pine Avenue property (DiLaura DDS).

1.3 Report Organization

This Construction Completion Report (CCR) is organized into the following sections:

Report Organization

SECTION	DESCRIPTION
Section 1 – Introduction	Site description and history.
Section 2 – Project Overview	Summary of Investigation activities.
Section 3 – Interim Remedial Measures (IRMs)	Report of IRM measures completed at the site to date.
Section 4 – References	Documents references for this report.

SECTION 2 PROJECT OVERVIEW

The site has a history of investigation and characterization efforts conducted which are summarized in the Phase I Remedial Investigation (RI) Report (Parsons 2022) and Phase II RI Report (Parsons, 2024). Prior investigations identified impacts to indoor air at the Time 1-Hour Cleaners property located at 2526 Pine Avenue associated with dry cleaning operations, including elevated concentrations of tetrachloroethylene (PCE), trichloroethene (TCE), and cis1,2dichloroethene (DCE). A sub-slab depressurization system (SSDS) was installed at the Time 1-Hour Cleaners property in 2012 to mitigate indoor air impacts. Subsequent investigations identified indoor air impacts in the form of elevated PCE concentrations within the DiLaura DDS building (2532 Pine Avenue).

A series of RI investigation activities beginning in Spring 2014 included collection of soil vapor samples from the Time 1-Hour Cleaners building, DiLaura DDS property, offsite Building 3, and from the Pine Avenue right-of-way to identify potential source areas associated with utility corridors. The RI activities also included collection of numerous overburden soil samples, surface soils, sub-surface soil samples, installation of bedrock monitoring wells, collection of bedrock groundwater samples, collection of overburden groundwater samples, collection of sump water samples from the basement of the DiLaura DDS building, and collection of sub-slab soil samples beneath the DiLaura DDS basement slab.

In 2015, GES implemented mitigation measures at the DiLaura DDS property, including sealing of a sump and gravel pit in the basement as well as the installation of three air purifying units (APU)s. Subsequently, four additional APUs were added to the DiLaura DDS property resulting in:

- 3 APUs in the basement
- 2 APUs on the ground floor (one each in the dentist's office and access corridor)
- 2 APUs within the second floor apartment

In 2017, the previously sealed sump in the DiLaura DDS building was modified to include a ventilation system to mitigate the potential buildup of volatile vapors within the sump.

In 2018, an SSDS was installed in the basement of an adjacent building to the site, referred to as Building 3 (as shown in **Figure 2**) by Ramboll due to elevated indoor air concentrations of PCE and TCE that were detected in samples collected in May 2017. To date, post system start-up sampling has not been completed due to lack of permission from the property owner to enter the building.

SECTION 3 INTERIM REMEDIAL MEASURES

Persistent indoor air impacts within the DiLaura DDS building necessitated the implementation of IRM activities to mitigate potential exposure of building residents to site contaminants, as discussed with New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) and documented in a memorandum submitted to NYSDEC on September 13, 2018 (**Appendix A**). IRM components are detailed in the following sections.

Cumulative indoor air concentrations over time for the basement, first floor, second floor, and ambient air are provided in **Table 1A** through **1D,** respectively.

3.1 Continued Operation Of Air Purifying Units (APUs)

In November 2015 three IQ Air GCX Series APUs were installed in the DiLaura DDS building. One APU was installed on each floor of the building, including the basement.

In March 2016, four AirPura APUs were purchased from Sylvane and installed in the DiLaura DDS building to supplement the original IQ Air units installed in 2015. Two of these units were installed in the basement, and one each on the first and second floors.

Despite being installed prior to the implementation a formal IRM, APUs within the DiLaura DDS building were a key component to mitigating indoor air impacts. The IRM included continue APU operation, monitoring, and maintenance (OM&M), which included routine replacement of volatile organic compound (VOC) filter cartridges and high-efficiency particulate air (HEPA) filters.

The APUs have continued to operate throughout the implementation of the remaining IRM components, described below. APUs were turned off following completion of the other IRM components and indoor air samples were collected to evaluate the efficacy of the non-APU IRM components. Due to the lack on sub-slab samples for the DiLaura DDS building, a direct comparison of the 2017 NYSDOH Decision Matrices cannot be completed. However, based on the current indoor air values, by default, the most stringent recommendations should be followed. Based on this, indoor air sample results demonstrated mitigation of indoor air impacts per the NYSDOH May 2017 Decision Matrices. It is recommended that the APUs remain at the property as a contingency measure in the event of future impacts are identified. Costs associated with this effort are included in **Table 2**.

3.2 Soil Vapor Extraction System

Persistent indoor air impacts of PCE and TCE following APU installation prompted further investigation into the DiLaura DDS basement and development of remedial measures beyond installation of APUs. Following a discussion between NYSDEC, NYSDOH, and Parsons on July 26, 2018, Parsons was directed to develop a short-term IRM, a long-term remedy, and a contingent remedy to supplement the long-term remedial approach. The following approaches were proposed in a memorandum to NYSDEC on September 13, 2018:

1. Short-term IRM: Seal basement floor slab/basement walls, lining of the sub-slab sanitary sewer utility in basement, including associated floor drains, and sealing of utility penetrations between the basement and 1st floor of the structure.
2. Long-Term Remedial Action: In addition to the measures implemented under the short-term IRM, the long-term remedy includes the installation of a three-well soil vapor extraction (SVE) system beneath the

basement floor. The SVE system will also include the installation of two passive-air injection points through the basement floor.

3. Contingent Remedial Action: If deemed necessary based on the performance of the SVE system, the system may be expanded to address a larger area. The expansion would include conversion of the passive-air intake wells noted above into SVE wells and installation of additional extraction wells outside of the footprint of the DiLaura building, providing greater coverage throughout the subsurface.

On January 15, 2019, Parsons submitted a memorandum presenting the proposed SVE system design to NYSDEC with the intent of further mitigating indoor air impacts associated with historical site operations by applying vacuum to the sub-slab environment and minimize vapor intrusion from beneath the slab to the building interior.

Potential remedial benefits beyond enhancement of indoor air were not included in the IRM work scope but will be included in the site Feasibility Study (FS). Additionally, the potential for saturated subsurface conditions was identified prior to the design and installation of the SVE system and have been observed to date since SVE system installation and start-up. Subsequent investigations into the nature of sub-slab water are discussed in the Phase I RI Report, as well as the Phase II RI Work Plan (Parsons 2022) and Phase II RI. System installation was completed in September 2019 and system start-up was conducted in January 2021. Significant water has been observed in each extraction well since their installation. Multiple dewatering events have been performed at the site to date. There is currently no available space to stage water tanks on the property to perform regular dewatering events and discharge to the City of Niagara Falls sewer system is not permitted., The frequency of these events was dependent on availability of a tank truck from the subcontracted waste management company to temporarily hold and transport the water offsite for disposal. Alternatives for optimizing SVE system performance will be evaluated in the FS.

The basis for SVE system design and description of the system components are provided in the following sections. Costs associated with the installation and OM&M of the SVE System is included in **Table 2**.

3.2.1 System Design

The design basis for the SVE system was presented in a memorandum submitted to NYSDEC on December 27, 2018 (**Appendix B**). The SVE system consists of a network of five vertical wells, three of which are extraction wells that are piped to the SVE system enclosure and two are passive air intake wells connected to an exterior above-grade inlet vent. The SVE system was prefabricated by National Environmental Systems (NES) and is housed in a 7-foot long by 8-foot wide by 8.5-foot tall insulated and sound attenuated enclosure. The primary SVE system components include:

- A regenerative blower with a one-half horse power motor, which is rated for a maximum flow rate of 90 cubic feet per minute at a vacuum of 20-inches of water column;
- Particulate filter;
- passive-air intake valve;
- Moisture separator with level switch and sight glass; and
- Drum-style granular activated carbon (GAC) off-gas treatment system.
- Climate controlled system enclosure

The system includes an instrumentation and control package equipped with a remote telemetry system to communicate system status and transmit any alarms that may occur to the system operator. The system provides alarm notifications for system low vacuum, moisture separator high level, high temperature, blower motor fault, and system shutdown (manual from local switch).

3.2.2 SVE & PVE Well Installation

The SVE system installation consists of five wells: Three extraction wells and two passive air intake wells, which are designated as SVE and passive vapor extraction (PVE) wells. Well placement was selected to minimize the impact to the usable space in the basement as well as target where the bulk of the contamination was located (near the sump and historic floor drains). PVE wells were located on the opposite side of the building from the SVE wells to draw fresh air through the material underneath the basement slab.

Each well was installed by coring a hole through the basement slab and removal of sub-slab soils using hand methods (e.g. post-hole digger, rock bars, shovels, etc.). Each boring was advanced to approximately 6 feet below slab and was constructed with 4-inch diameter schedule 80 (SCH80) polyvinyl chloride (PVC) riser and .010-slot screen. Well construction schematics are shown on **Figure 3**. Encountered soils were observed to consist of fine sands, fine to coarse gravel, silt, and clay. Elevated photoionization detector (PID) readings and odors were encountered in well locations SVE-02 and SVE-03. Water was encountered while installing all SVE and PVE well locations. Since the object of the SVE and PVE wells were to remove soil vapor, no development of the wells was required. While extraction of soil vapor from the SVE wells takes place at the top of the SVE well, water is also encountered in the wells and is collected in the high-level (moisture separator).

Conveyance piping was installed in trenches running from the each of the wells to the foundation wall. The trenches were approximately 8-inches wide by 18-inches deep. Material was removed and the trenches were backfilled with New York State Department Of Transportation (NYSDOT) #1 fill material. Excavated material was placed in five 55-galon drums and sampled as part of IDW waste management. Conveyance piping consists of 2-inch diameter Schedule 40 PVC.

The conveyance piping transitions to 1.25-inch galvanized pipe as it penetrates the basement slab and runs to a valve with vacuum gauge and sampling port before connecting to a 1.25-inch galvanized header pipe. The header pipe penetrates the foundation wall and runs to the SVE enclosure. PVE wells are constructed with in a similar fashion, except the lateral runs, vertical runs, and header piping are all constructed of schedule 80 PVC. The PVE header pipe penetrates the building foundation wall and terminates at an exterior vent.

3.2.3 System Piping

Conveyance piping conducts soil vapor from the point of extraction to the SVE regenerative blower. Once the piping exits the building, it is wrapped and insulated until it enters the climate-controlled system enclosure. External piping (outside the SVE enclosure) is shown on **Figure 4**. System piping is shown in the system manual in **Appendix C**.

3.2.4 System Startup

Following system start-up in January 2021, monthly system inspections and required maintenance has been performed. The system start-up was completed in accordance with the SVE system manual provided to Parsons by NES, this document is included in **Appendix C**.

3.2.5 System Dewatering

Significant water has been observed in each extraction well since their installation. Multiple dewatering events have been performed at the site to date. There is currently no available space to stage water tanks on the property to perform regular dewatering events and discharge to the City of Niagara Falls sewer system is not permitted., The frequency of these events was dependent on availability of a tank truck from the subcontracted

waste management company to temporarily hold and transport the water offsite for disposal. Alternatives for optimizing SVE system performance will be evaluated in the FS.

3.3 Sewer Renovation/Replacement

Investigation of the condition of an on-site sewer utility was conducted on January 13th, 2020. The sewer inspection was completed using a camera inside of the DiLaura DDS sub-slab sewer utility from 1) the cleanout to the sewer connection, and 2) from the cleanout into the building interior. The results of the inspection indicated that the section within the building footprint had excessive scale buildup and was cracked in multiple areas. Further, the sewer main was observed to contain debris resulting from breakdown of the pipe material.

In addition to visual indications of degradation, surveys of air quality using a PID indicated that the floor drains, which are directly connected to the sewer, and sewer vent were likely a major contributing source of indoor air impacts to the basement, and likely the entire building. Therefore, NYSDEC and Parsons decided to abandon the existing sub-slab utility and install a new above-slab sewer line. This work was completed in January 2021 by a licensed City of Niagara Falls Plumbing company, DV Brown. A new PVC pipe was installed above grade in the basement. The new PVC sewer line was then connected to the sewer lateral which runs to the main line that is parallel to Pine Avenue. The old sewer line was grouted in place and capped off. Costs associated with this effort are included in **Table 2**.

3.4 Basement Slab and Utility Penetrations Sealing

Numerous cracks and cold joints were present in the DiLaura DDS basement slab as well multiple utility penetrations from the basement to the first floor. To mitigate potential vapor intrusion from the subsurface into the basement the concrete slab was coated with an epoxy concrete sealant and cold joints and cracks were filled and sealed with an elastomeric caulk in August 2021. In addition, utilities, penetrations, and chases in the first floor were sealed with a combination of spray foam and elastomeric caulk to minimize communication of air from the basement to the working and living spaces on the first and second floor. Costs associated with this effort are included in **Table 2**.

3.5 Site Drainage Renovation

Over the course of numerous site visits and discussions with the property owner, the DiLaura DDS property was observed to act as a catchment for a significant amount of surface water during, and following, rain events. This surface water was thought to be a potential contributor to saturated conditions observed beneath the DiLaura DDS basement slab that were noted in Section 3.2.

Additionally, rainwater from the roof of both the Time 1-Hour Cleaners and DiLaura DDS buildings was discharged via gutters and downspouts to a small area on the DiLaura DDS property. Further, a clay pipe utility was encountered during installation of one of the SVE wells. Discussion with the property owner indicated that this pipe was likely connected to a roof downspout and discharged into the sewer. The pipe was left in place.

In August 2021, the roof downspout discharging beneath the basement slab was capped, and the gutter system for the second story was rerouted to the first story system, where it joined runoff from the first story roof and discharged to the storm water collection basin in the back parking lot of DiLaura DDS. Subsequently, the property owner installed a new drainage system in the DiLaura DDS parking area to contain runoff and convey it away from the property, via catch basin and storm drain, to a storm water utility located in the alleyway bounding the site to the north. Following installation of the below-grade drainage infrastructure, the property owner had the

entire area behind the DiLaura DDS building paved with asphalt and sealed. These efforts eliminated the pooling water issue in the parking area behind DiLaura DDS building however, it has not been observed to have any impact on the amount of water underneath the basement slab. NYSDEC costs associated with the efforts completed by Parsons are included in **Table 2**.

SECTION 4 WASTE MANAGEMENT

The following sections document wastes generated during the implementation of IRM activities, as well as waste management and disposal practices associated with each.

4.1 SVE System Well Installation Waste

Waste generated during the drilling, trenching, and installation processes were placed into 55-gallon NYSDOT-approved drums. A total of 275 gallons of soil were generated as part of this work. In addition to this, two 55-gallon drums were filled with concrete that were removed from the basement floor and two 55-gallon drums were filled with decontamination water. The drums were temporarily staged onsite in the DiLaura DDS parking lot. On-site soil was not reused as fill material.

Waste classification samples, , were collected in June 2019 for soil and liquids, no sample was collected from the concrete. At the request of the disposal company, subsequent soil samples were collected for Total Metals and Total VOCs in August and September 2019, respectively.

Analytical results from environmental samples collected from SVE and PVE borings indicate that soils removed during drilling operations contained elevated PCE concentrations. Waste characterization analytical results are summarized in **Table 3A .** Laboratory Analytical reports are included in **Appendix D-1**.

Veolia was contracted to perform soil drum transportation and disposal on September 9, 2019. The soil determined to be hazardous was delivered to the US Ecology – Wayne Disposal facility located at 49350 NI-94 Service Drive Belleville, MI 43111. This material was transported under manifest number 001563242.

Non-hazardous concrete and water were transported under manifest number004521533 to a Veolia disposal facility located at 4301 Infirmary Road, West Carrollton, OH 45449. Both manifests were under generator ID NYCESQD. Manifests and/or bills of lading are included in **Appendix E-1**.

4.2 DiLaura DDS Basement Sub-Slab Water

Persistent water levels have been observed in each of the DiLaura DDS SVE and PVE wells since their installation. Water levels fluctuate slightly but are generally static at screen level. Dewatering events have been performed periodically and generally consist of:

1. Vacuum extraction of water accumulated in SVE wells using a Vac-Truck.
2. Manual pumping of sub-slab water using groundwater pumps, and containerization and staging of purged water.

Multiple dewatering events (between one and two days each) were completed and found to have minimal impact on drawdown of the water beneath the basement slab. A total of 890 gallons of water were disposed as a result of these dewatering events (**Appendix E-2**). There is currently no available space to stage water tanks on the property to perform regular dewatering events and discharge to the City of Niagara Falls sewer system is not permitted; The frequency of these events was dependent on availability of a tank truck from the subcontracted waste management company to temporarily hold and transport the water offsite for disposal. Alternatives for addressing the basement sub-slab water will be evaluated in the Feasibility Study.

A waste stream for sub-slab water related to these efforts has been established through collection of waste characterization sample analysis. Waste characterization analytical result summaries are shown in **Table 3B.** Characterization results are included in **Appendix D-2**. The water was transported off-site as hazardous waste by Miller Environmental Group, Inc. and taken for disposal to Cycle Chem PA under generator ID NYD012966156. Manifest numbers associated with these disposal events are 014280975 FLE, 001215540 FLE, 014280994 FLE, and 001215534 FLE. Manifests are included in **Appendix E-2**.

SECTION 5 CONCLUSION/RECOMMENDATIONS

- Periodic assessment of SVE systems should be performed yearly to determine optimal system effectiveness.
- Inspection of SVE and PVE wells for leaks or signs of wear/degradation
- Replace faulty or worn components as needed
- Continued OM&M inspections will be performed on a monthly basis for SVE system
- Comprehensive water level measurements shall be completed for all overburden, bedrock, and SVE/PVE wells installed at the Site
- Check the gauges and sample ports and collect vacuum and PID readings, record to the observation log
- Collect one SVE piping air sample per discussions with NYSDOH and NYSDEC.
- Collect indoor air samples one time per heating season until it is determined that it is no longer necessary.

SECTION 6 REFERENCES

Parsons, 2022. Remedial Investigation Report, Time 1-Hour Cleaners Site Niagara Falls New York, NYSDEC Site Number 932158. Prepared for NYSDEC. April 8, 2022.

Parsons, 2024. Phase II Remedial Investigation Report for the Time 1-Hour Cleaners Site.

TABLES

Table 1A
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results - Basement
2014 through 2024

Location ID		2865E-IA		2865E-IA		2865E-SS*		2865E-IA		2865E-IA		2865E-IA-01		2865E-IA-02		2865E-IA-02	
Sample ID		2865E-IA-032614		IAD-032614		2865E-SS-032614		2865E-IA-033115		IAD-033115		2865E-IA-091115-01		2865E-IA-091115-02		2865E-IA-091115-DUP	
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR		AIR	
Sample Date		3/27/2014		3/27/2014		3/27/2014		3/31/2015		3/31/2015		9/11/2015		9/11/2015		9/11/2015	
Sample Type Code		N		FD		N		N		FD		N		N		FD	
Chemical Name	Unit																
1,1,1-Trichloroethane (TCA)	ug/m3	0.034	U	0.034	U	0.29	U	0.034	U	0.034	U	0.034	U	0.034	U	0.034	U
1,1,2,2-Tetrachloroethane	ug/m3	0.057	U	0.057	U	0.49	U	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/m3	0.6		0.6		0.64	U	0.41	J	0.41	J	0.72	J	0.72	J	0.68	J
1,1,2-Trichloroethane	ug/m3	0.058	U	0.058	U	0.5	U	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U
1,1-Dichloroethane	ug/m3	0.04	U	0.04	U	0.34	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U
1,1-Dichloroethene	ug/m3	0.034	U	0.034	U	0.29	U	0.034	U	0.034	U	0.034	U	0.034	U	0.034	U
1,2,4-Trichlorobenzene	ug/m3	0.098	U	0.098	U	0.84	U	0.098	U	0.098	U	0.098	U	0.098	U	0.098	U
1,2,4-Trimethylbenzene	ug/m3	2.5		2.5		0.36	U	6.9	J+	6.6	J+	6		6.9		7.5	
1,2-Dibromoethane (Ethylene Dibromide)	ug/m3	0.06	U	0.06	U	0.52	U	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U
1,2-Dichlorobenzene	ug/m3	0.056	U	0.056	U	0.48	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U
1,2-Dichloroethane	ug/m3	0.24		0.24		0.34	U	0.35		0.35		0.87		0.83		0.83	
1,2-Dichloropropane	ug/m3	0.056	U	0.056	U	0.48	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U
1,2-Dichlorotetrafluoroethane	ug/m3	0.058	U	0.058	U	0.5	U	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U
1,3,5-Trimethylbenzene (Mesitylene)	ug/m3	0.54		0.53		0.29	U	1.3	J+	1.4	J+	1.4		1.6		1.8	
1,3-Butadiene	ug/m3	0.04	U	0.04	U	0.34	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U
1,3-Dichlorobenzene	ug/m3	0.047	U	0.047	U	0.4	U	0.047	U	0.047	U	0.047	U	0.047	U	0.047	U
1,4-Dichlorobenzene	ug/m3	1.4		1.4		0.45	U	7.3		7.3		4.6		5.3		5.6	
1,4-Dioxane (P-Dioxane)	ug/m3	0.82	U	0.82	U	7	U	0.82	U	0.82	U	0.82	U	0.82	U	0.82	U
2,2,4-Trimethylpentane	ug/m3	-		-		-		-		-		-		-		-	
2-Chlorotoluene	ug/m3	-		-		-		-		-		-		-		-	
2-Hexanone	ug/m3	0.037	U	0.53		0.31	U	0.037	U	0.037	U	0.037	U	0.037	U	0.037	U
4-Ethyltoluene	ug/m3	0.62		0.66		0.33	U	1.4		1.4		1.3		1.6		1.7	
Acetone	ug/m3	150		170	J	380		280		260		460		460		410	
Allyl Chloride (3-Chloropropene)	ug/m3	-		-		-		-		-		-		-		-	
Benzene	ug/m3	2.2		2.2		4.4		7.3		7.1		3.3		3.8		4	
Benzyl Chloride	ug/m3	0.035	U	0.035	U	0.3	U	0.035	UJ	0.035	UJ	0.035	UJ	0.035	UJ	0.035	UJ
Bromodichloromethane	ug/m3	0.051	U	0.051	U	0.44	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U
Bromoform	ug/m3	0.07	U	0.07	U	0.6	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U
Bromomethane	ug/m3	0.094	U	0.094	U	0.8	U	0.094	UJ	0.094	UJ	0.094	U	0.094	U	0.094	U
Carbon Disulfide	ug/m3	0.038	U	0.038	U	49		0.066	J	0.055	J	0.13	J	0.11	J	0.038	U
Carbon Tetrachloride	ug/m3	0.43		0.45		0.46	U	0.64		0.57		0.49		0.46		0.45	
Chlorobenzene	ug/m3	0.056	U	0.056	U	0.48	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U
Chloroethane	ug/m3	0.035	U	0.035	U	6.8		0.035	U	0.035	U	0.035	U	0.035	U	0.035	U
Chloroform	ug/m3	0.22		0.22		0.34	U	0.21		0.22		0.81		0.68		0.68	
Chloromethane	ug/m3	1.1		1.1		1.6		1		1.1		0.92		0.96		0.9	
Cis-1,2-Dichloroethylene	ug/m3	13		13		6.7		14		17		10		12		12	
Cis-1,3-Dichloropropene	ug/m3	0.042	U	0.042	U	0.36	U	0.042	U	0.042	U	0.042	U	0.042	U	0.042	U
Cyclohexane	ug/m3	0.93		0.94		91		2.7		2.7		1.8		2.2		2.3	
Dibromochloromethane	ug/m3	0.08	U	0.08	U	0.68	U	0.08	U	0.08	U	0.08	U	0.08	U	0.08	U
Dichlorodifluoromethane	ug/m3	1.3		1.4		0.64	U	0.6	J	0.86	J	2.1		2.1		2	
Ethanol	ug/m3	310		360		270		590		860		520		600		610	

Table 1A
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results - Basement
2014 through 2024

Location ID		2865E-IA		2865E-IA		2865E-SS*		2865E-IA		2865E-IA		2865E-IA-01		2865E-IA-02		2865E-IA-02	
Sample ID		2865E-IA-032614		IAD-032614		2865E-SS-032614		2865E-IA-033115		IAD-033115		2865E-IA-091115-01		2865E-IA-091115-02		2865E-IA-091115-DUP	
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR		AIR	
Sample Date		3/27/2014		3/27/2014		3/27/2014		3/31/2015		3/31/2015		9/11/2015		9/11/2015		9/11/2015	
Sample Type Code		N		FD		N		N		FD		N		N		FD	
Chemical Name	Unit																
Ethyl Acetate	ug/m3	0.094	U	0.094	U	0.81	U	31	J	9	J	2.1		2.4		2.6	
Ethylbenzene	ug/m3	1.7		1.7		1.9		5.6		5.6		4.2		4.8		5.2	
Hexachlorobutadiene	ug/m3	0.14	U	0.14	U	1.2	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
Isopropanol	ug/m3	2200	J+	2400	J+	670	J+	3000		4200		2600	J	2900	J	3000	J
m,p-Xylene	ug/m3	5.9		6.1		7.2		25		24		17		19		20	
Methyl Ethyl Ketone (2-Butanone)	ug/m3	1.2	J	2.8	J	5.4	J	3.4	J	2	J	5		4.3		4.1	J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ug/m3	0.034	U	0.19		0.29	UJ	0.034	U	0.034	U	0.47		0.51		0.44	
Methyl Methacrylate	ug/m3	-		-		-		-		-		-		-		-	
Methylene Chloride	ug/m3	0.15	U	0.15	U	14		4.5		2.4		1.3		1.1	J	1.2	
M-P-Xylene	ug/m3	-		-		-		-		-		-		-		-	
Naphthalene	ug/m3	0.4		0.49		0.86	UJ	0.55	J+	0.72	J+	0.85		0.89		1.2	
N-Heptane	ug/m3	1.5		1.5		72		7.7	J	7.5	J	3.4		4.2		4.3	
N-Hexane	ug/m3	6.7		6.9		130		31	J	28	J	5.4	J	6.3	J	6.6	J
O-Xylene (1,2-Dimethylbenzene)	ug/m3	2.4		2.4		2.7		8.2	J+	8	J+	6		6.8		7.3	
Propylene	ug/m3	0.18	U	0.18	U	1.6	U	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U
Styrene	ug/m3	0.029	U	0.029	U	0.25	U	0.17		0.14	J	0.37		0.42		0.49	
Tert-Butyl Alcohol	ug/m3	0.16	U	0.16	U	1.4	U	0.23	U	0.23	U	1.6		1.5	J	7.6	J
Tert-Butyl Methyl Ether	ug/m3	0.039	U	0.039	U	0.33	U	0.039	U	0.039	U	0.039	UJ	0.039	UJ	0.039	UJ
Tetrachloroethylene (PCE)	ug/m3	640		700		420		550		750		210		220		220	
Tetrahydrofuran	ug/m3	0.043	U	0.043	U	7.5		0.043	U	0.043	U	3		2.3		2.3	
Toluene	ug/m3	11		11		18		40		36		15		15		15	
Trans-1,2-Dichloroethene	ug/m3	0.17		0.18		0.31	U	0.21		0.27		0.15		0.16		0.16	
Trans-1,3-Dichloropropene	ug/m3	0.043	U	0.043	U	0.36	U	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U
Trichloroethylene (TCE)	ug/m3	24		23		12		37		41		21		25		25	
Trichlorofluoromethane	ug/m3	2		2		0.59	U	2.4		2.6		3.7		3.9		3.5	
Vinyl Acetate	ug/m3	0.063	U	0.063	U	0.53	U	0.063	UJ	0.063	UJ	0.063	U	0.063	U	0.063	U
Vinyl Bromide	ug/m3	-		-		-		-		-		-		-		-	
Vinyl Chloride	ug/m3	0.095		0.093		260		0.12		0.13		0.038	U	0.038	U	0.038	U
Xylenes	ug/m3	-		-		-		-		-		-		-		-	

Notes:
* = Incomplete sub-slab sample due to water being pulled into the canister during sampling
IA = Indoor Air
- = Indicates compound was not sampled for
N = Normal Sample
FD = Field Duplicate Sample
U = Not detected at the detection limit shown
J = Estimated value
UJ = Approximate non-detect
J+ = Estimate biased high
ug/m3 = microgram per cubic meter

Table 1A
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results - Basement
2014 through 2024

Location ID		2865E-IA-01		2865E-IA		2532-IA		2532-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA	
Sample ID		2865E-IA-0333116-01		2865E-IA-111716-01		2532-IA-120818-04		2532-IA-120818-05		2532-IA-120420-01		2532-IA-120420-02		2532-IA-42221-01		2532-IA-42221-02					
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR		AIR					
Sample Date		3/31/2016		11/18/2016		12/8/2018		12/8/2018		12/4/2020		12/4/2020		4/23/2021		4/23/2021					
Sample Type Code		N		N		N		N		N		N		N		N					
Chemical Name	Unit																				
1,1,1-Trichloroethane (TCA)	ug/m3	0.034	U	0.46		0.44	U	0.44	U	0.44	U	0.44	U	8.7	U	8.7	U				
1,1,2,2-Tetrachloroethane	ug/m3	0.057	U	0.057	U	0.55	U	0.55	U	0.55	U	0.55	U	11	U	11	U				
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/m3	0.73	J	0.48	J	0.61	U	0.61	U	0.61	U	0.61	U	12	U	12	U				
1,1,2-Trichloroethane	ug/m3	0.058	U	0.058	U	0.44	U	0.44	U	0.44	U	0.44	U	8.7	U	8.7	U				
1,1-Dichloroethane	ug/m3	0.04	U	0.04	U	0.65	U	0.65	U	0.32	U	0.32	U	6.5	U	6.5	U				
1,1-Dichloroethene	ug/m3	0.44		0.39		0.13	U	0.13	U	0.16		0.16	U	3.2	U	3.2	U				
1,2,4-Trichlorobenzene	ug/m3	0.098	U	0.098	U	0.59	U	0.59	U	0.59	U	0.59	U	12	U	12	U				
1,2,4-Trimethylbenzene	ug/m3	2.8		0.33		0.93		0.59	J	0.45		0.54		7.9	U	7.9	U				
1,2-Dibromoethane (Ethylene Dibromide)	ug/m3	0.06	U	0.06	U	1		0.61	U	0.61	U	0.61	U	12	U	12	U				
1,2-Dichlorobenzene	ug/m3	0.056	U	0.056	U	0.19	U	0.19	U	0.48	U	0.48	U	9.6	U	9.6	U				
1,2-Dichloroethane	ug/m3	0.43		0.17		0.65	U	0.65	U	0.32	U	0.32	U	6.5	U	6.5	U				
1,2-Dichloropropane	ug/m3	0.056	U	0.056	U	0.74	U	0.74	U	0.37	U	0.37	U	7.4	U	7.4	U				
1,2-Dichlorotetrafluoroethane	ug/m3	0.058	U	0.058	U	0.56	U	0.56	U	0.56	U	0.56	U	11	UJ	11	UJ				
1,3,5-Trimethylbenzene (Mesitylene)	ug/m3	0.75		0.086	J	0.79	U	0.79	U	0.39	U	0.39	U	7.9	U	7.9	U				
1,3-Butadiene	ug/m3	0.04	U	0.28	J	0.35	U	0.35	U	-		-		-		-					
1,3-Dichlorobenzene	ug/m3	0.047	U	0.047	U	0.48	U	0.48	U	0.48	U	0.48	U	9.6	U	9.6	U				
1,4-Dichlorobenzene	ug/m3	1.8		0.39		0.48	U	0.48	U	0.48	U	0.48	U	9.6	U	9.6	U				
1,4-Dioxane (P-Dioxane)	ug/m3	0.82	U	0.82	U	0.58	U	0.58	U	0.72	U	0.72	U	14	U	14	U				
2,2,4-Trimethylpentane	ug/m3	-		-		0.89		0.84		0.93	U	0.93	U	19	U	19	U				
2-Chlorotoluene	ug/m3	-		-		0.83	U	0.83	U	-		-		-		-					
2-Hexanone	ug/m3	0.42		0.037	U	0.65	U	0.65	U	-		-		-		-					
4-Ethyltoluene	ug/m3	0.74		0.079	J	0.79	U	0.79	U	-		-		-		-					
Acetone	ug/m3	430		150		20		5.7		-		-		-		-					
Allyl Chloride (3-Chloropropene)	ug/m3	-		-		0.5	U	0.5	U	-		-		-		-					
Benzene	ug/m3	8.1		1		0.89		1.5		1.4		1.5		5.1	U	5.1	U				
Benzyl Chloride	ug/m3	0.035	U	0.035	U	0.82	UJ	0.82	UJ	0.83	U	0.83	U	17	U	17	U				
Bromodichloromethane	ug/m3	0.051	U	0.094	J	0.54	U	0.54	U	0.54	U	0.54	U	11	U	11	U				
Bromoform	ug/m3	0.07	U	0.07	U	0.33	U	0.33	U	0.83	U	0.83	U	17	U	17	U				
Bromomethane	ug/m3	0.094	U	0.094	U	0.62	U	0.62	U	0.31	U	0.31	U	6.2	UJ	6.2	UJ				
Carbon Disulfide	ug/m3	0.038	U	0.3	J	0.5	U	0.5	U	-		-		-		-					
Carbon Tetrachloride	ug/m3	0.82		0.25		0.2	U	0.42		0.37		0.41		4	UJ	4	UJ				
Chlorobenzene	ug/m3	0.056	U	0.056	U	0.74	U	0.74	U	0.37	U	0.37	U	7.4	U	7.4	U				
Chloroethane	ug/m3	0.035	U	0.035	U	0.42	U	0.42	U	0.21	U	0.21	U	4.2	U	4.2	U				
Chloroform	ug/m3	1.1		0.9		0.54	J	0.78	U	1.9		1.9		7.8	U	7.8	U				
Chloromethane	ug/m3	1.2		1.5	J	0.78		0.89		1.1	J+	1.2	J+	8.3	U	8.3	U				
Cis-1,2-Dichloroethylene	ug/m3	58		16		4.4		0.13	U	4.8		5		3.7		3.8					
Cis-1,3-Dichloropropene	ug/m3	0.042	U	0.042	U	0.73	U	0.73	U	0.36	U	0.36	U	7.3	U	7.3	U				
Cyclohexane	ug/m3	5.5		0.69		0.41	J	0.38	J	0.96		0.99		14	U	14	U				
Dibromochloromethane	ug/m3	0.08	U	0.08	U	0.68	U	0.68	U	0.68	U	0.68	U	14	U	14	U				
Dichlorodifluoromethane	ug/m3	1.9		0.8		1.8		2		1.1	J	1.1	J	7.9	U	7.9	U				
Ethanol	ug/m3	1200	J+	1000		580	J	11		1700		1800		3000		3000					

Table 1A
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results - Basement
2014 through 2024

Location ID		2865E-IA-01		2865E-IA		2532-IA		2532-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA			
Sample ID		2865E-IA-0333116-01		2865E-IA-111716-01		2532-IA-120818-04		2532-IA-120818-05		2532-IA-120420-01		2532-IA-120420-02		2532-IA-42221-01		2532-IA-42221-02					
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR		AIR					
Sample Date		3/31/2016		11/18/2016		12/8/2018		12/8/2018		12/4/2020		12/4/2020		4/23/2021		4/23/2021					
Sample Type Code		N		N		N		N		N		N		N		N					
Chemical Name	Unit																				
Ethyl Acetate	ug/m3	5.1	J+	1.5		0.94		0.58	U	-		-		-		-					
Ethylbenzene	ug/m3	2.5		0.26		0.69		0.69	U	0.53		0.54		6.9	U	6.9	U				
Hexachlorobutadiene	ug/m3	0.14	U	0.14	U	0.77	U	0.77	U	0.85	U	0.85	U	17	U	17	U				
Isopropanol	ug/m3	2300	J	2100		109	J	1.8		-		-		-		-					
m,p-Xylene	ug/m3	11		0.89						2		2.1		6.9	U	6.9	U				
Methyl Ethyl Ketone (2-Butanone)	ug/m3	4.1		0.75	J	0.35	J	0.5		0.94	U	3.3		19	U	19	U				
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ug/m3	2.9		0.034	U	0.66	U	0.66	U	0.82	U	0.82	U	16	U	16	U				
Methyl Methacrylate	ug/m3	-		-		0.66	U	0.66	U	-		-		-		-					
Methylene Chloride	ug/m3	1.1	J	0.66	J	0.56	U	2.4		4.8		1.8		28	U	28	U				
M-P-Xylene	ug/m3	-		-		2.6		1.7		-		-		-		-					
Naphthalene	ug/m3	1.2		0.21						1	U	1	U	21	U	21	U				
N-Heptane	ug/m3	2.7		0.3		0.7		0.66		-		-		-		-					
N-Hexane	ug/m3	12	J	4.9	J	2.3		2.4		3.7		3.6		14	U	14	U				
O-Xylene (1,2-Dimethylbenzene)	ug/m3	3.7		0.34		1		0.61	J	0.65		0.69		6.9	U	6.9	U				
Propylene	ug/m3	0.18	U	0.18	UJ	0.69	U	0.69	U	-		-		-		-					
Styrene	ug/m3	0.029	U	0.093	J	0.68	U	0.68	U	0.34	U	0.34	U	6.8	U	6.8	U				
Tert-Butyl Alcohol	ug/m3	2.7	J+	0.66		0.49	U	0.49	U	0.97	U	1		19	UJ	19	UJ				
Tert-Butyl Methyl Ether	ug/m3	0.039	U	0.039	U	0.58	U	0.58	U	0.58	U	0.58	U	12	U	12	U				
Tetrachloroethylene (PCE)	ug/m3	710		46		4.1		0.2	J	1.8		1.8		11		11					
Tetrahydrofuran	ug/m3	0.25		0.043	U	0.47	U	0.47	U	-		-		-		-					
Toluene	ug/m3	21		2.3		4.1		2.6		5.4		5		12		12					
Trans-1,2-Dichloroethene	ug/m3	1		0.32		0.63	U	0.63	U	0.32	U	0.32	U	6.3	U	6.3	U				
Trans-1,3-Dichloropropene	ug/m3	0.043	U	0.043	U	0.73	U	0.73	U	0.36	U	0.36	U	7.3	U	7.3	U				
Trichloroethylene (TCE)	ug/m3	130		10		1.3		0.17	U	2		1.2		3.9		3.9	U				
Trichlorofluoromethane	ug/m3	3.2		2.9		1.7		1.7		6.1		6.2		9	UJ	9	UJ				
Vinyl Acetate	ug/m3	0.063	U	0.063	U	0.56	U	0.56	U	-		-		-		-					
Vinyl Bromide	ug/m3	-		-		0.7	U	0.7	U	-		-		-		-					
Vinyl Chloride	ug/m3	0.86		2.4		10		0.082	U	5		5.2		2.8		2.8					
Xylenes	ug/m3	-		-		3.6		2.3		-		-		-		-					

Notes:
* = Incomplete sub-slab sample due to water being pulled into the canister during sampling
IA = Indoor Air
- = Indicates compound was not sampled for
N = Normal Sample
FD = Field Duplicate Sample
U = Not detected at the detection limit shown
J = Estimated value
UJ = Approximate non-detect
J+ = Estimate biased high
ug/m3 = microgram per cubic meter

Table 1A
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results - Basement
2014 through 2024

Location ID		2532-IA		2532-IA		2532-IA		2532-IA		2532-IA		2532-IA		2532-IA	
Sample ID		2532-IA-040622-01		2532-IA-040622-02		2532-IA-01202023-01		2532-IA-01202023-02		2532-IA-042324-01		2532-IA-042324-02		2532-IA-042324-03	
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR	
Sample Date		4/7/2022		4/7/2022		1/20/2023		1/20/2023		4/24/2024		4/24/2024		4/24/2024	
Sample Type Code		N		FD		N		N		N		N		FD	
Chemical Name	Unit														
1,1,1-Trichloroethane (TCA)	ug/m3	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U
1,1,2,2-Tetrachloroethane	ug/m3	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/m3	0.36	J	0.31	J	1.1	U	0.33	J	0.4	J	0.41	J	0.38	J
1,1,2-Trichloroethane	ug/m3	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U
1,1-Dichloroethane	ug/m3	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
1,1-Dichloroethene	ug/m3	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
1,2,4-Trichlorobenzene	ug/m3	0.26	U	0.26	U	0.26	U	0.26	U	0.52	U	0.52	U	0.46	J
1,2,4-Trimethylbenzene	ug/m3	0.22		0.23		0.41		0.42		3.6		3.9		3.9	
1,2-Dibromoethane (Ethylene Dibromide)	ug/m3	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U
1,2-Dichlorobenzene	ug/m3	0.21	U	0.21	U	0.21	U	0.21	U	0.21	U	0.21	U	0.084	J
1,2-Dichloroethane	ug/m3	0.14	U	0.14	U	0.14	U	0.14	U	0.13	J	0.12	J	0.14	
1,2-Dichloropropane	ug/m3	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
1,2-Dichlorotetrafluoroethane	ug/m3	0.25	U	0.25	U	0.25	U	0.25	U	0.13	J	0.12	J	0.12	J
1,3,5-Trimethylbenzene (Mesitylene)	ug/m3	0.17	U	0.17	U	0.12	J	0.11	J	0.83		0.9		0.89	
1,3-Butadiene	ug/m3	0.078	U	0.078	U	0.078	U	0.078	U	-		-		-	
1,3-Dichlorobenzene	ug/m3	0.21	U	0.21	U	0.21	U	0.21	U	0.21	U	0.21	U	0.21	U
1,4-Dichlorobenzene	ug/m3	0.21	U	0.21	U	0.21		0.22		2.1		2.3		2.2	
1,4-Dioxane (P-Dioxane)	ug/m3	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U		U
2,2,4-Trimethylpentane	ug/m3	-		-		-		-		2.3		2.4		2.5	
2-Chlorotoluene	ug/m3	-		-		-		-		-		-		-	
2-Hexanone	ug/m3	0.14	U	0.14	U	0.31		0.38		-		-		-	
4-Ethyltoluene	ug/m3	0.17	U	0.17	U	0.13	J	0.11	J	-		-		-	
Acetone	ug/m3	35		33		22		30		-		-		-	
Allyl Chloride (3-Chloropropene)	ug/m3	-		-		-		-		-		-		-	
Benzene	ug/m3	0.29		0.32		0.79		0.8		3.6	J	2.8	J	2.8	J
Benzyl Chloride	ug/m3	0.18	U	0.18	U	0.18	U	0.18	U	0.36	UJ	0.36	UJ	0.36	UJ
Bromodichloromethane	ug/m3	0.24	U	0.24	U	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
Bromoform	ug/m3	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U
Bromomethane	ug/m3	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
Carbon Disulfide	ug/m3	1.1	U	1.1	U	1.1	U	1.1	U	-		-		-	
Carbon Tetrachloride	ug/m3	0.22	U	0.22	U	0.2	J	0.27		0.53	J	0.44	J	0.46	J
Chlorobenzene	ug/m3	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
Chloroethane	ug/m3	0.093	U	0.093	U	0.093	UJ	0.093	UJ	0.092	U	0.092	U	0.092	U
Chloroform	ug/m3	0.17	U	0.17	U	0.17	U	0.17		0.16	J	0.17	U	0.17	U
Chloromethane	ug/m3	1.2		1.2		0.79		0.77		1		1		1	
Cis-1,2-Dichloroethylene	ug/m3	0.41		0.38		0.29		0.32		0.54		0.61		0.64	
Cis-1,3-Dichloropropene	ug/m3	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
Cyclohexane	ug/m3	0.12	U	0.12	U	0.33		0.39		2.3		2.7		2.6	
Dibromochloromethane	ug/m3	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
Dichlorodifluoromethane	ug/m3	1.1		1.1		1.1		1.1		1.9		2		1.8	
Ethanol	ug/m3	240		250		130		120		1400	J	1500	J	1500	J

Table 1A
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results - Basement
2014 through 2024

Location ID		2532-IA		2532-IA		2532-IA		2532-IA		2532-IA		2532-IA		2532-IA							
Sample ID		2532-IA-040622-01		2532-IA-040622-02		2532-IA-01202023-01		2532-IA-01202023-02		2532-IA-042324-01		2532-IA-042324-02		2532-IA-042324-03							
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR							
Sample Date		4/7/2022		4/7/2022		1/20/2023		1/20/2023		4/24/2024		4/24/2024		4/24/2024							
Sample Type Code		N		FD		N		N		N		N		FD							
Chemical Name	Unit																				
Ethyl Acetate	ug/m3	1.3	U	0.69	J	1.3	U	1.3	U	-		-		-							
Ethylbenzene	ug/m3	0.2		0.23		0.35		0.36		3.4		3.5		3.5							
Hexachlorobutadiene	ug/m3	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U						
Isopropanol	ug/m3	210		210		250		210		-		-		-							
m,p-Xylene	ug/m3	0.71		0.8		1.4		1.4		13		13		13							
Methyl Ethyl Ketone (2-Butanone)	ug/m3	4.1	U	4.1	U	1.4	J	1.7	J	4.1	U	4.1	U	4.1	U						
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ug/m3	0.14	U	0.14	U	0.14	U	0.1	J	0.14	U	0.14	U	0.14	U						
Methyl Methacrylate	ug/m3	-		-		-		-		-		-		-							
Methylene Chloride	ug/m3	4.1		4.2		1.2	UJ	1.2	UJ	0.38	J	0.39	J	0.41	J						
M-P-Xylene	ug/m3	-		-		-		-		-		-		-							
Naphthalene	ug/m3	0.18	U	0.18	U	0.18	U	0.18	U	0.49	J-	0.53	J-	0.65	J-						
N-Heptane	ug/m3	0.22		0.23		0.55		0.45		4		4.5		4.5							
N-Hexane	ug/m3	1.1	J	1	J	2	J	2	J	12		13		13							
O-Xylene (1,2-Dimethylbenzene)	ug/m3	0.28		0.31		0.48		0.53		4.2		4.5		4.5							
Propylene	ug/m3	2.4	U	2.4	U	2.4	U	2.4	U	-		-		-							
Styrene	ug/m3	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U						
Tert-Butyl Alcohol	ug/m3	-		-		-		-		0.35	J	0.36	J	0.38	J						
Tert-Butyl Methyl Ether	ug/m3	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U						
Tetrachloroethylene (PCE)	ug/m3	0.71		0.7		0.79		0.81		6		5.6		5.8							
Tetrahydrofuran	ug/m3	0.18	J	0.17	J	1	U	1	U	-		-		-							
Toluene	ug/m3	1.8		1.8		3.7		3.8		22		23		23							
Trans-1,2-Dichloroethene	ug/m3	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U						
Trans-1,3-Dichloropropene	ug/m3	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U						
Trichloroethylene (TCE)	ug/m3	0.16	J	0.15	J	0.19		0.21		0.6		0.56		0.57							
Trichlorofluoromethane	ug/m3	1.8		1.7		1.5		1.6		2.6		2.6		2.6							
Vinyl Acetate	ug/m3	2.5	U	2.5	U	2.5	U	2.6		-		-		-							
Vinyl Bromide	ug/m3	-		-		-		-		-		-		-							
Vinyl Chloride	ug/m3	0.29		0.29		0.09	U	0.09		0.089	U	0.11		0.093							
Xylenes	ug/m3	-		-		-		-		-		-		-							

Notes:
* = Incomplete sub-slab sample due to water being pulled into the canister during sampling
IA = Indoor Air
- = Indicates compound was not sampled for
N = Normal Sample
FD = Field Duplicate Sample
U = Not detected at the detection limit shown
J = Estimated value
UJ = Approximate non-detect
J+ = Estimate biased high
ug/m3 = microgram per cubic meter

Table 1B
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - 1st Floor
2015 through 2024

Location ID		2865E-FF		2865E-IA-03		2865E-IA-05		2865E-IA-03		2865E-SS		2865E-IA		2865E-IA		2865E-IA					
Sample ID		2865E-FF-033115		2865E-IA-091115-03		2865E-IA-091115-05		2865E-IA-0333116-03		2865E-SS-0333116-01		2865E-IA-081816-01		2865E-IA-081816-03		2865E-IA-081816-DUP					
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR		AIR					
Sample Date		3/31/2015		9/11/2015		9/11/2015		3/31/2016		3/31/2016		8/19/2016		8/19/2016		8/19/2016					
Sample Type Code		N		N		N		N		N		N		N		FD					
Chemical Name	Unit																				
1,1,1-Trichloroethane (TCA)	ug/m3	-		0.034	U	0.034	U	0.098	U	0.098	U	0.034	U	0.034	U	0.034	U				
1,1,2,2-Tetrachloroethane	ug/m3	0.057	U	0.057	U	0.057	U	0.16	U	0.16	U	0.057	U	0.057	U	0.057	U				
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/m3	0.67	J	0.68	J	0.66	J	1.1	J	0.21	U	0.63	J	0.66	J	0.65	J				
1,1,2-Trichloroethane	ug/m3	0.058	U	0.058	U	0.058	U	0.17	U	0.17	U	0.058	U	0.058	U	0.058	U				
1,1-Dichloroethane	ug/m3	0.04	U	0.04	U	0.04	U	0.11	U	0.11	U	0.04	U	0.04	U	0.04	U				
1,1-Dichloroethene	ug/m3	0.034	U	0.034	U	0.034	U	0.097	U	0.097	U	0.034	U	0.034	U	0.034	U				
1,2,4-Trichlorobenzene	ug/m3	0.098	U	0.098	U	0.098	U	0.28	U	0.28	U	0.098	U	0.098	U	0.098	U				
1,2,4-Trimethylbenzene	ug/m3	6.4	J+	13		20		2.3		13		0.43		3.1		0.38					
1,2-Dibromoethane (Ethylene Dibromide)	ug/m3	0.06	U	0.06	U	0.06	U	0.17	U	0.17	U	0.06	U	0.06	U	0.06	U				
1,2-Dichlorobenzene	ug/m3	0.056	U	0.056	U	0.22		0.16	U	0.16	U	0.056	U	0.056	U	0.056	U				
1,2-Dichloroethane	ug/m3	0.27		0.34		0.83		0.11	U	0.11	U	0.83		0.039	U	0.84					
1,2-Dichloropropane	ug/m3	-		0.056	U	0.056	U	0.16	U	0.16	U	0.056	UJ	0.056	UJ	0.056	UJ				
1,2-Dichlorotetrafluoroethane	ug/m3	0.058	U	0.058	U	0.058	U	0.17	U	0.17	U	0.058	U	0.058	U	0.058	U				
1,3,5-Trimethylbenzene (Mesitylene)	ug/m3	1.2	J+	6.2		10		0.59		4.6		0.1	J	0.71		0.086	J				
1,3-Butadiene	ug/m3	0.04	U	0.04	U	0.04	U	0.11	U	0.11	U	0.04	U	0.04	U	0.04	U				
1,3-Dichlorobenzene	ug/m3	0.047	U	0.047	U	0.047	U	0.13	U	0.13	U	0.047	U	0.047	U	0.047	U				
1,4-Dichlorobenzene	ug/m3	16		13		8.8		2		0.15	U	0.4		1.8		0.42					
1,4-Dioxane (P-Dioxane)	ug/m3	-		0.82	U	0.82	U	2.3	U	2.3	U	0.82	U	0.82	U	0.82	U				
2,2,4-Trimethylpentane	ug/m3	-		-		-		-		-		-		-		-					
2-Hexanone	ug/m3	0.055	J	0.037	U	0.037	U	0.1	U	0.1	U	0.037	UJ	0.037	UJ	0.037	UJ				
4-Ethyltoluene	ug/m3	4.7		6.6		2.6		0.6		2.2		0.09	J	2.4		0.086	J				
Acetone	ug/m3	400		1000		570		380		13		200		240		200					
Benzene	ug/m3	2.8	J	12		23		6.2		4		0.99		1.8		0.9					
Benzyl Chloride	ug/m3	0.035	UJ	0.035	UJ	0.035	UJ	0.1	U	0.1	U	0.035	U	0.035	U	0.035	U				
Bromodichloromethane	ug/m3			0.051	U	0.051	U	0.15	U	0.15	U	0.36		0.24		0.37					
Bromoform	ug/m3	0.07	U	0.07	U	0.07	U	0.2	U	0.2	U	0.07	U	0.07	U	0.07	U				
Bromomethane	ug/m3	0.094	UJ	0.094	U	0.094	U	0.27	U	0.27	U	0.094	U	0.094	U	0.094	U				
Carbon Disulfide	ug/m3	0.15	J	0.14	J	0.15	J	0.11	U	1	J	0.33	J	0.33	J	0.33	J				
Carbon Tetrachloride	ug/m3	0.4	J	0.61		0.38		0.72		0.15	U	0.39		0.3		0.4					
Chlorobenzene	ug/m3	0.056	U	0.056	U	0.056	U	0.16	U	0.16	U	0.056	U	0.056	U	0.056	U				
Chloroethane	ug/m3	0.035	U	0.035	U	0.035	U	0.1	U	0.1	U	0.035	U	0.035	U	0.035	U				
Chloroform	ug/m3	0.21		0.64		0.04	U	0.8		0.11	U	1.3		0.84		1.3					
Chloromethane	ug/m3	1.6		1.3		1.4		1.6		0.22	J	1.8	J+	2	J+	1.8	J+				
Cis-1,2-Dichloroethylene	ug/m3	1.6		3.8		2.9		18		3.6		19		3		19					
Cis-1,3-Dichloropropene	ug/m3	-		0.042	U	0.042	U	0.12	U	0.12	U	0.042	U	0.042	U	0.042	U				
Cyclohexane	ug/m3	2.3	J	8.4		37		6.1		5.2		2.2		2.7		2.2					
Dibromochloromethane	ug/m3	0.08	U	0.08	U	0.08	U	0.23	U	0.23	U	0.08	U	0.08	U	0.08	U				
Dichlorodifluoromethane	ug/m3	1.1	J	2.3		2.1		4		3.1		0.89	J	1.1	J	0.92	J				
Ethanol	ug/m3	4500		3600		1100		8500	J	7	J	1500		4200		1500					
Ethyl Acetate	ug/m3	0.094	U	8.3		0.094	U	5.7	J+	1.3	J+	3.9		14		4.3					
Ethylbenzene	ug/m3	5.3		17		23		2.1		3.7		0.25		2		0.29					

Table 1B
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - 1st Floor
2015 through 2024

Location ID		2865E-FF		2865E-IA-03		2865E-IA-05		2865E-IA-03		2865E-SS		2865E-IA		2865E-IA		2865E-IA					
Sample ID		2865E-FF-033115		2865E-IA-091115-03		2865E-IA-091115-05		2865E-IA-0333116-03		2865E-SS-0333116-01		2865E-IA-081816-01		2865E-IA-081816-03		2865E-IA-081816-DUP					
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR		AIR					
Sample Date		3/31/2015		9/11/2015		9/11/2015		3/31/2016		3/31/2016		8/19/2016		8/19/2016		8/19/2016					
Sample Type Code		N		N		N		N		N		N		N		FD					
Chemical Name	Unit																				
Hexachlorobutadiene	ug/m3	0.14	U	0.14	U	0.14	U	0.4	U	0.4	U	0.14	UJ	0.14	UJ	0.14	UJ				
Isopropanol	ug/m3	33000		11000	J	4500	J	21000		8	J	3600		9500		3600					
m,p-Xylene	ug/m3	22		24		22		9.7		21		0.99		8		1.2					
Methyl Ethyl Ketone (2-Butanone)	ug/m3	0.077	U	8.5		5.3		5.1	J	1.5	J	2.6	J	0.077	U	2.4	J				
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ug/m3	-		0.034	U	0.034	U	1.5		0.098	U	0.034	U	0.034	U	0.12	J				
Methylene Chloride	ug/m3	3.9		1.6		2.9		0.75	J	0.42	U	0.69	J	0.94	J	0.97	J				
Naphthalene	ug/m3	0.1	U	2.1		12		0.29	U	0.29	U	0.39	J	0.49	J	0.36	J				
N-Heptane	ug/m3	3.3	J	15		72		3.3		11		0.4		1.6		0.29					
N-Hexane	ug/m3	25	J	22	J	120	J	50	J	7.4	J	5.8		16		6					
O-Xylene (1,2-Dimethylbenzene)	ug/m3	7.7	J+	20		16		3		7.9		0.37		2.9		0.44					
Propylene	ug/m3	0.18	U	0.18	U	0.18	U	0.53	U	0.53	U	0.18	UJ	0.18	UJ	0.18	UJ				
Styrene	ug/m3	0.25		0.47		0.18		0.083	U	0.083	U	0.029	UJ	0.09	J	0.029	UJ				
Tert-Butyl Alcohol	ug/m3	6.1		3.9		1.9		9.5	J+	0.47	U	0.16	U	0.16	U	0.16	U				
Tert-Butyl Methyl Ether	ug/m3	0.039	U	0.039	UJ	0.039	UJ	0.4		0.11	U	0.039	U	0.039	U	0.039	U				
Tetrachloroethylene (PCE)	ug/m3	180		180		140		240		210		61		18		58					
Tetrahydrofuran	ug/m3	0.043	U	0.96		0.75		0.12	U	0.12	U	0.69		0.043	U	0.59					
Toluene	ug/m3	33		14		27		19		14		2.4		10		3.5					
Trans-1,2-Dichloroethene	ug/m3	0.037	U	0.037	U	0.037	U	0.1	U	0.1	U	0.35		0.037	U	0.32					
Trans-1,3-Dichloropropene	ug/m3	-		0.043	U	0.043	U	0.12	U	0.12	U	0.043	U	0.043	U	0.043	U				
Trichloroethylene (TCE)	ug/m3	16	J	9.6		8.1		39		6		11		1.8		11					
Trichlorofluoromethane	ug/m3	7.4		5		5.2		12		3.2		6.2		8.6		6					
Vinyl Acetate	ug/m3	0.063	UJ	0.063	U	0.063	U	0.18	U	0.18	U	0.063	UJ	0.063	UJ	0.063	UJ				
Vinyl Chloride	ug/m3	0.065	J	0.038	U	0.038	U	0.34		0.11	U	0.16		0.038	U	0.17					

Notes:
IA = Indoor Air
FF = First Floor
- = Indicates compound was not sampled for
N = Normal Sample
FD = Field Duplicate Sample
U = Not detected at the detection limit shown
J = Estimated value
UJ = Approximate non-detect
J+ = Estimate biased high
ug/m3 = microgram per cubic meter

Table 1B
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - 1st Floor
2015 through 2024

Location ID		2865E-IA		2532-IA		2532-IA		2532-IA		2865E-IA		2865E-IA					
Sample ID		2865E-IA-111716-03		2532-IA-01202023-05		2532-IA-040622-05		2532-IA-042324-04		2532-IA-120420-05		2532-IA-42221-05					
Matrix		AIR		AIR		AIR		AIR		AIR		AIR					
Sample Date		11/18/2016		1/20/2023		4/7/2022		4/24/2024		12/4/2020		4/23/2021					
Sample Type Code		N		N		N		N		N		N					
Chemical Name	Unit																
1,1,1-Trichloroethane (TCA)	ug/m3	0.48		0.19	U	0.19	U	0.19	U	0.44	U	8.7	U				
1,1,2,2-Tetrachloroethane	ug/m3	0.057	U	0.24	U	0.24	U	0.24	U	0.55	U	11	U				
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/m3	0.47	J	0.47	J	0.61	J	0.49	J	0.61	U	12	U				
1,1,2-Trichloroethane	ug/m3	0.058	U	0.19	U	0.19	U	0.19	U	0.44	U	8.7	U				
1,1-Dichloroethane	ug/m3	0.17		0.14	U	0.14	U	0.14	U	0.32	U	6.5	U				
1,1-Dichloroethene	ug/m3	0.32		0.14	U	0.14	U	0.14	U	0.16	U	3.2	U				
1,2,4-Trichlorobenzene	ug/m3	0.098	U	0.26	U	0.26	U	0.52	U	0.59	U	12	U				
1,2,4-Trimethylbenzene	ug/m3	1.2		0.55		0.17	U	1.1		0.39	U	7.9	U				
1,2-Dibromoethane (Ethylene Dibromide)	ug/m3	0.06	U	0.27	U	0.27	U	0.27	U	0.61	U	12	U				
1,2-Dichlorobenzene	ug/m3	0.056	U	0.21	U	0.21	U	0.21	U	0.48	U	9.6	U				
1,2-Dichloroethane	ug/m3	0.16		0.16		0.14	U	0.27		0.32	U	6.5	U				
1,2-Dichloropropane	ug/m3	0.056	U	0.16	U	0.16	U	0.16	U	0.37	U	7.4	U				
1,2-Dichlorotetrafluoroethane	ug/m3	0.058	U	0.25	U	0.25	U	0.14	J	0.56	U	11	UJ				
1,3,5-Trimethylbenzene (Mesitylene)	ug/m3	0.28		0.12	J	0.17	U	0.23		0.39	U	7.9	U				
1,3-Butadiene	ug/m3	0.29	J	0.078	U	0.078	U	-		-		-					
1,3-Dichlorobenzene	ug/m3	0.047	U	0.21	U	0.21	U	0.21	U	0.48	U	9.6	U				
1,4-Dichlorobenzene	ug/m3	0.5		0.24		0.21	U	0.49		0.48	U	9.6	U				
1,4-Dioxane (P-Dioxane)	ug/m3	0.82	U	1.3	U	1.3	U	1.3	U	0.72	U	14	U				
2,2,4-Trimethylpentane	ug/m3	-		-		-		0.6		0.93	U	19	U				
2-Hexanone	ug/m3	0.037	U	0.31		0.14	U	-		-		-					
4-Ethyltoluene	ug/m3	0.27		0.15	J	0.17	U	-		-		-					
Acetone	ug/m3	250		45		15		-		-		-					
Benzene	ug/m3	2.6		1.2		0.3		1.4	J	0.84		5.1	U				
Benzyl Chloride	ug/m3	0.035	U	0.18	U	0.18	U	0.36	UJ	0.83	U	17	U				
Bromodichloromethane	ug/m3	0.051	U	0.24	U	0.24	U	0.23	U	0.54	U	11	U				
Bromoform	ug/m3	0.07	U	0.36	U	0.36	U	0.36	U	0.83	U	17	U				
Bromomethane	ug/m3	0.094	U	0.14	U	0.14	U	0.14	U	0.31	U	6.2	UJ				
Carbon Disulfide	ug/m3	0.39	J	1.1	U	1.1	U	-		-		-					
Carbon Tetrachloride	ug/m3	0.32		0.45		0.45		0.6	J	0.37		4	UJ				
Chlorobenzene	ug/m3	0.056	U	0.16	U	0.16	U	0.16	U	0.37	U	7.4	U				
Chloroethane	ug/m3	0.035	U	0.093	UJ	0.093	U	0.092	U	0.21	U	4.2	U				
Chloroform	ug/m3	0.77		0.3		0.17	U	0.31		0.58		7.8	U				
Chloromethane	ug/m3	1.6	J	0.81		1.3		1.1		1.2	J+	8.3	U				
Cis-1,2-Dichloroethylene	ug/m3	6.1		0.16		0.14	U	0.29		1.2		3.2	U				
Cis-1,3-Dichloropropene	ug/m3	0.042	U	0.16	U	0.16	U	0.16	U	0.36	U	7.3	U				
Cyclohexane	ug/m3	1.8		0.76		0.12	U	1.6		0.69	U	14	U				
Dibromochloromethane	ug/m3	0.08	U	0.3	U	0.3	U	0.3	U	0.68	U	14	U				
Dichlorodifluoromethane	ug/m3	0.76		1.3		1.7		2.1		1.1	J	7.9	U				
Ethanol	ug/m3	5700		1500		7.6		9200	J	5200		16000					
Ethyl Acetate	ug/m3	9.4		1.3	U	1.3	U	-		-		-					
Ethylbenzene	ug/m3	0.77		0.44		0.15	U	1		0.35	U	6.9	U				

Table 1B
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - 1st Floor
2015 through 2024

Location ID		2865E-IA		2532-IA		2532-IA		2532-IA		2865E-IA		2865E-IA					
Sample ID		2865E-IA-111716-03		2532-IA-01202023-05		2532-IA-040622-05		2532-IA-042324-04		2532-IA-120420-05		2532-IA-42221-05					
Matrix		AIR		AIR		AIR		AIR		AIR		AIR					
Sample Date		11/18/2016		1/20/2023		4/7/2022		4/24/2024		12/4/2020		4/23/2021					
Sample Type Code		N		N		N		N		N		N					
Chemical Name	Unit																
Hexachlorobutadiene	ug/m3	0.14	U	0.37	U	0.37	U	0.37	U	0.85	U	17	U				
Isopropanol	ug/m3	12000		3000		5.2		-		-		-					
m,p-Xylene	ug/m3	3.2		1.6		0.21	J	3.6		1.1		6.9	U				
Methyl Ethyl Ketone (2-Butanone)	ug/m3	2	J	1.4	J	4.1	U	4.1	U	0.94	U	19	U				
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ug/m3	0.034	U	0.19		0.14	U	0.14	U	0.82	U	16	U				
Methylene Chloride	ug/m3	0.88	J	1.2	UJ	1.2	U	0.5	J	3.8		28	U				
Naphthalene	ug/m3	0.26		0.17	J	0.18	U	0.36	J	1	U	21	U				
N-Heptane	ug/m3	1.2		0.64		0.14	J	1.2									
N-Hexane	ug/m3	36		3.2	J	4.9	U	17		7.1		14	U				
O-Xylene (1,2-Dimethylbenzene)	ug/m3	1.2		0.6		0.091	J	1.3		0.38		6.9	U				
Propylene	ug/m3	0.18	UJ	2.4	U	2.4	U										
Styrene	ug/m3	0.072	J	0.11	J	0.15	U	0.15	U	0.34	U	6.8	U				
Tert-Butyl Alcohol	ug/m3	2.2		-		-		2.1		0.97	U	19	UJ				
Tert-Butyl Methyl Ether	ug/m3	0.039	U	0.13	U	0.13	U	0.13	U	0.58	U	12	U				
Tetrachloroethylene (PCE)	ug/m3	45		0.69		0.27		1		0.76		11	U				
Tetrahydrofuran	ug/m3	0.14		1	U	1	U	-		-		-					
Toluene	ug/m3	7.9		4.2		0.73		5.9		3		9	U				
Trans-1,2-Dichloroethene	ug/m3	0.14		0.14	U	0.14	U	0.14	U	0.32	U	6.3	U				
Trans-1,3-Dichloropropene	ug/m3	0.043	U	0.16	U	0.16	U	0.16	U	0.36	U	7.3	U				
Trichloroethylene (TCE)	ug/m3	3.9		0.15	J	0.13	J	0.19		0.54		3.9	U				
Trichlorofluoromethane	ug/m3	6.6		8.3		1.5		9.7		11		10	J				
Vinyl Acetate	ug/m3	0.063	U	2.5	U	2.5	U	-		-		-					
Vinyl Chloride	ug/m3	1.3		0.09	U	0.09	U	0.089	U	1		2	U				

Notes:
IA = Indoor Air
FF = First Floor
- = Indicates compound was not sampled for
N = Normal Sample
FD = Field Duplicate Sample
U = Not detected at the detection limit shown
J = Estimated value
UJ = Approximate non-detect
J+ = Estimate biased high
ug/m3 = microgram per cubic meter

Table 1C
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - 2nd Floor
2015 through 2024

Location ID		2865E-IA-04		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA	
Sample ID		2865E-IA-091115-04		2865E-IA-081816-04		2865E-IA-111716-04		2865E-IA-111716-05		2865E-IA-111716-06		2865E-IA-111716-07		2865E-IA-111716-08		2865E-IA-111716-DUP					
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR		AIR					
Sample Date		9/11/2015		8/19/2016		11/18/2016		11/18/2016		11/18/2016		11/18/2016		11/18/2016		11/18/2016					
Sample Type Code		N		N		N		N		N		N		N		FD					
Chemical Name	Unit																				
1,1,1-Trichloroethane (TCA)	ug/m3	0.034	U	0.034	U	0.11	J	0.25		0.37		0.35		0.32		0.36	J				
1,1,2,2-Tetrachloroethane	ug/m3	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U				
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/m3	0.7	J	0.32	J	0.55	J	0.86	J	0.9	J	0.83	J	0.86	J	0.42	J				
1,1,2-Trichloroethane	ug/m3	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U				
1,1-Dichloroethane	ug/m3	0.04	U	0.04	U	0.04	U	0.068	J	0.04	U	0.11	J	0.11	J	0.04	U				
1,1-Dichloroethene	ug/m3	0.034	U	0.034	U	0.15	J	0.034	U	0.18		0.18		0.2		0.36	J				
1,2,4-Trichlorobenzene	ug/m3	0.098	U	0.098	U	0.098	U	0.098	U	0.098	U	0.098	U	0.098	U	0.098	U				
1,2,4-Trimethylbenzene	ug/m3	4.1		0.23		4.9	J	1		0.21		0.6		0.71		0.31	J				
1,2-Dibromoethane (Ethylene Dibromide)	ug/m3	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U				
1,2-Dichlorobenzene	ug/m3	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U				
1,2-Dichloroethane	ug/m3	0.18		0.96		0.42	J	2.1		1.7		2.1		2.7		0.17	J				
1,2-Dichloropropane	ug/m3	0.056	U	0.056	UJ	0.056	U	0.062	J	0.056	U	0.056	U	0.056	U	0.056	U				
1,2-Dichlorotetrafluoroethane	ug/m3	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U				
1,3,5-Trimethylbenzene (Mesitylene)	ug/m3	0.96		0.055	J	1.1	J	0.21		0.034	U	0.13	J	0.15	J	0.079	J				
1,3-Butadiene	ug/m3	0.04	U	0.04	U	0.43	J	1.4	J	1.4	J	1.3	J	1.3	J	0.27	J				
1,3-Dichlorobenzene	ug/m3	0.047	U	0.047	U	0.047	U	0.047	U	0.047	U	0.047	U	0.047	U	0.047	U				
1,4-Dichlorobenzene	ug/m3	1.3		0.14	J	0.71	J	0.6		0.053	U	0.42		0.5		0.36	J				
1,4-Dioxane (P-Dioxane)	ug/m3	0.82	U	0.82	U	0.82	U	0.82	U	0.82	U	0.82	U	0.82	U	0.82	U				
2,2,4-Trimethylpentane	ug/m3	-		-		-		-		-		-		-		-					
2-Chlorotoluene	ug/m3	-		-		-		-		-		-		-		-					
2-Hexanone	ug/m3	0.037	U	0.43	J	1.2	J	0.037	U	0.037	U	0.71		0.037	U	0.037	U				
4-Ethyltoluene	ug/m3	1		0.048	J	1.1	J	0.22		0.039	U	0.14	J	0.16	J	0.076	J				
Acetone	ug/m3	130		250		210	J	370		180		240		250		210	J				
Allyl Chloride (3-Chloropropene)	ug/m3	-		-		-		-		-		-		-		-					
Benzene	ug/m3	2.4		0.21		3.9	J	1.5		0.41		1		1.2		1.1	J				
Benzyl Chloride	ug/m3	0.035	UJ	0.035	U	0.035	U	0.035	U	0.035	U	0.035	U	0.035	U	0.035	U				
Bromodichloromethane	ug/m3	0.051	U	0.051	U	0.46	J	0.67		0.37		0.53		0.52		0.34	J				
Bromoform	ug/m3	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U				
Bromomethane	ug/m3	0.094	U	0.094	U	0.094	U	0.094	U	0.094	U	0.094	U	0.094	U	0.094	U				
Carbon Disulfide	ug/m3	0.038	U	0.24	J	0.42	J	0.87	J	0.97	J	0.85	J	0.89	J	0.26	J				
Carbon Tetrachloride	ug/m3	0.39		0.15	J	0.38	J	0.56		0.48		0.5		0.5		0.3	J				
Chlorobenzene	ug/m3	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U				
Chloroethane	ug/m3	0.035	U	0.035	U	0.035	U	0.035	U	0.035	U	0.085	J	0.076	J	0.035	U				
Chloroform	ug/m3	0.35		0.9		0.94	J	2		1.9		1.8		1.8		0.92	J				
Chloromethane	ug/m3	1.3		3	J+	2	J	4	J	2.7	J	2.9	J	3.4	J	1.5	J				
Cis-1,2-Dichloroethylene	ug/m3	1.4		0.27		8	J	3.9		2.9		3.6		3.6		16	J				
Cis-1,3-Dichloropropene	ug/m3	0.042	U	0.042	U	0.042	U	0.042	U	0.042	U	0.042	U	0.042	U	0.042	U				
Cyclohexane	ug/m3	1.2		0.069	U	1.7	J	1.1		0.85		1		1		0.67	J				
Dibromochloromethane	ug/m3	0.08	U	0.08	U	0.08	U	0.11	J	0.08	U	0.08	U	0.08	U	0.08	U				
Dichlorodifluoromethane	ug/m3	2.2		0.62	J	0.86	J	0.77		0.77		0.75		0.84		0.72	J				
Ethanol	ug/m3	250		2400		3600	J	12000		7700		8400		8800		950	J				

Table 1C
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - 2nd Floor
2015 through 2024

Location ID		2865E-IA-04		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA	
Sample ID		2865E-IA-091115-04		2865E-IA-081816-04		2865E-IA-111716-04		2865E-IA-111716-05		2865E-IA-111716-06		2865E-IA-111716-07		2865E-IA-111716-08		2865E-IA-111716-DUP					
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR		AIR					
Sample Date		9/11/2015		8/19/2016		11/18/2016		11/18/2016		11/18/2016		11/18/2016		11/18/2016		11/18/2016					
Sample Type Code		N		N		N		N		N		N		N		FD					
Chemical Name	Unit																				
Ethyl Acetate	ug/m3	1.6		5.4		4.6	J	47		7.8		11		11		1.5	J				
Ethylbenzene	ug/m3	3.3		0.13	J	3	J	0.97		0.16		0.44		0.52		0.26	J				
Hexachlorobutadiene	ug/m3	0.14	U	0.14	UJ	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U				
Isopropanol	ug/m3	760	J	480		3700	J	3500		2500		3200		3500		2000	J				
m,p-Xylene	ug/m3	13		0.55		12	J	2.7		0.6		1.6		1.8		0.95	J				
Methyl Ethyl Ketone (2-Butanone)	ug/m3	2.8	J	4.2		2.7	J	2.1	J	1.9	J	4.5		3	J	2.4	J				
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ug/m3	0.034	U	0.19		0.034	U	0.42		0.034	U	0.85		0.73		0.034	U				
Methyl Methacrylate	ug/m3	-		-		-		-		-		-		-		-					
Methylene Chloride	ug/m3	1.2		0.92	J	1	J	0.73	J	0.98	J	0.98	J	0.72	J	0.66	J				
M-P-Xylene	ug/m3	-		-		-		-		-		-		-		-					
Naphthalene	ug/m3	0.54		0.1	UJ	1.7	J	0.9		0.36		1.2		1.9		0.17	J				
N-Heptane	ug/m3	2.6		0.5		2.7	J	0.7		0.27		0.57		0.67		0.32	J				
N-Hexane	ug/m3	5.1	J	1.2	J	23	J	8.8		2.9	J	7.3		8.5		5.1	J				
O-Xylene (1,2-Dimethylbenzene)	ug/m3	4.6		0.21		4.4	J	1		0.25		0.63		0.69		0.34	J				
Propylene	ug/m3	0.18	U	0.18	UJ	0.18	UJ	0.18	UJ	0.18	UJ	0.18	UJ	0.18	UJ	0.18	UJ				
Styrene	ug/m3	0.029	U	0.054	J	0.27	J	0.42		0.029	U	0.21		0.26		0.087	J				
Tert-Butyl Alcohol	ug/m3	0.56		0.16	U	1.5	J	3.3		1.9		3		3.1		1	J				
Tert-Butyl Methyl Ether	ug/m3	0.039	UJ	0.039	U	0.039	U	0.039	U	0.039	U	0.039	U	0.039	U	0.12	J				
Tetrachloroethylene (PCE)	ug/m3	50		1.1		38	J	21		4.3		14		15		46	J				
Tetrahydrofuran	ug/m3	0.36		0.78		0.46	J	1.2		1.3		0.94		0.91		0.18	J				
Toluene	ug/m3	13		1.4		19	J	8.4		2.9		6.5		7.5		2.5	J				
Trans-1,2-Dichloroethene	ug/m3	0.037	U	0.037	U	0.17	J	0.086	J	0.037	U	0.1	J	0.086	J	0.33	J				
Trans-1,3-Dichloropropene	ug/m3	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U				
Trichloroethylene (TCE)	ug/m3	3		19		8.2	J	10		4.5		7		6.7		11	J				
Trichlorofluoromethane	ug/m3	2.6		1.9		3.6	J	4.1		4		4		4		2.9	J				
Vinyl Acetate	ug/m3	0.063	U	0.063	UJ	0.063	U	0.063	U	0.063	U	0.063	U	0.063	U	0.063	U				
Vinyl Bromide	ug/m3	-		-		-		-		-		-		-		-					
Vinyl Chloride	ug/m3	0.038	U	0.038	U	1.5	J	1.3		1.2		1.2		1.2		2.6	J				
Xylenes	ug/m3	-		-		-		-		-		-		-		-					

Notes:
IA = Indoor Air
FF = First Floor
- = Indicates compound was not sampled for
N = Normal Sample
FD = Field Duplicate Sample
U = Not detected at the detection limit shown
J = Estimated value
UJ = Approximate non-detect
ug/m3 = microgram per cubic meter

Table 1C
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - 2nd Floor
2015 through 2024

Location ID		2532-IA		2532-IA		2532-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2532-IA					
Sample ID		2532-IA-120818-01		2532-IA-120818-02		2532-IA-120818-03		2532-IA-120420-03		2532-IA-120420-04		2532-IA-42221-03		2532-IA-42221-04		2532-IA-040622-03					
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR		AIR					
Sample Date		12/8/2018		12/8/2018		12/8/2018		12/4/2020		12/4/2020		4/23/2021		4/23/2021		4/7/2022					
Sample Type Code		N		N		N		N		N		N		N		N					
Chemical Name	Unit																				
1,1,1-Trichloroethane (TCA)	ug/m3	0.44	U	0.44	U	0.44	U	0.44	U	0.44	U	8.7	U	8.7	U	0.19	U				
1,1,2,2-Tetrachloroethane	ug/m3	0.55	U	0.55	U	0.55	U	0.55	U	0.55	U	11	U	11	U	0.24	U				
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/m3	0.61	U	0.61	U	0.61	U	0.65		0.61	U	12	U	12	U	1.1	U				
1,1,2-Trichloroethane	ug/m3	0.44	U	0.44	U	0.44	U	0.44	U	0.44	U	8.7	U	8.7	U	0.19	U				
1,1-Dichloroethane	ug/m3	0.65	U	0.65	U	0.65	U	0.32	U	0.32	U	6.5	U	6.5	U	0.14	U				
1,1-Dichloroethene	ug/m3	0.13	U	0.13	U	0.13	U	0.16	U	0.16	U	3.2	U	3.2	U	0.14	U				
1,2,4-Trichlorobenzene	ug/m3	0.59	U	0.59	U	0.59	U	0.59	U	0.59	U	12	U	12	U	0.26	U				
1,2,4-Trimethylbenzene	ug/m3	0.59	J	38		0.64	J	0.41		0.39	U	7.9	U	7.9	U	0.21					
1,2-Dibromoethane (Ethylene Dibromide)	ug/m3	1.2		32		0.61	U	0.61	U	0.61	U	12	U	12	U	0.27	U				
1,2-Dichlorobenzene	ug/m3	0.19	U	0.19	U	0.19	U	0.48	U	0.48	U	9.6	U	9.6	U	0.21	U				
1,2-Dichloroethane	ug/m3	2.2		4		0.65	U	2.2		2		6.5	U	6.5	U	0.14	U				
1,2-Dichloropropane	ug/m3	0.74	U	0.74	U	0.74	U	0.37	U	0.37	U	7.4	U	7.4	U	0.16	U				
1,2-Dichlorotetrafluoroethane	ug/m3	0.56	U	0.56	U	0.56	U	0.56	U	0.56	U	11	UJ	11	UJ	0.25	U				
1,3,5-Trimethylbenzene (Mesitylene)	ug/m3	0.79	U	17		0.79	U	0.39	U	0.39	U	7.9	U	7.9	U	0.17	U				
1,3-Butadiene	ug/m3	0.35	U	0.35	U	0.35	U	-		-		-		-		0.078	U				
1,3-Dichlorobenzene	ug/m3	0.48	U	0.48	U	0.48	U	0.48	U	0.48	U	9.6	U	9.6	U	0.21	U				
1,4-Dichlorobenzene	ug/m3	0.48	U	0.48	U	0.48	U	0.48	U	0.48	U	9.6	U	9.6	U	0.21	U				
1,4-Dioxane (P-Dioxane)	ug/m3	0.58	U	0.58	U	0.58	U	0.72	U	0.72	U	14	U	14	U	1.3	U				
2,2,4-Trimethylpentane	ug/m3	0.35	J	4.7		0.56	J	0.93	U	0.93	U	19	U	19	U	-					
2-Chlorotoluene	ug/m3	0.83	U	0.83	U	0.83	U	-		-		-		-		-					
2-Hexanone	ug/m3	0.65	U	1.3		0.65	U	-		-		-		-		0.14	U				
4-Ethyltoluene	ug/m3	0.79	U	6.4		0.79	U	-		-		-		-		0.17	U				
Acetone	ug/m3	42.8		70.8		31.1		-		-		-		-		23					
Allyl Chloride (3-Chloropropene)	ug/m3	0.5	U	0.5	U	0.5	U	-		-		-		-		-					
Benzene	ug/m3	0.42	J	1.9		0.7		1		0.77		5.1	U	5.1	U	0.2					
Benzyl Chloride	ug/m3	0.82	UJ	0.82	UJ	0.82	UJ	0.83	U	0.83	U	17	U	17	U	0.18	U				
Bromodichloromethane	ug/m3	0.54	U	0.54	U	0.54	U	0.54	U	0.55		11	U	11	U	0.24	U				
Bromoform	ug/m3	0.33	U	0.33	U	0.33	U	0.83	U	0.83	U	17	U	17	U	0.36	U				
Bromomethane	ug/m3	0.62	U	0.62	U	0.62	U	0.31	U	0.31	U	6.2	UJ	6.2	UJ	0.14	U				
Carbon Disulfide	ug/m3	0.5	U	0.31	J	0.5	U	-		-		-		-		0.49	J				
Carbon Tetrachloride	ug/m3	0.2	U	0.2	U	0.2	U	0.52		0.54		4	UJ	4	UJ	0.22	U				
Chlorobenzene	ug/m3	0.74	U	0.74	U	0.74	U	0.37	U	0.37	U	7.4	U	7.4	U	0.16	U				
Chloroethane	ug/m3	0.42	U	0.42	U	0.42	U	0.21	U	0.21	U	4.2	U	4.2	U	0.093	U				
Chloroform	ug/m3	1.2		1.1		0.78	U	1.4		1.8		7.8	U	7.8	U	0.17					
Chloromethane	ug/m3	1.8		1.7		0.85		4.4	J+	4.2	J+	8.3	U	8.3	U	3.3					
Cis-1,2-Dichloroethylene	ug/m3	0.48		0.75		1.7		0.71		0.54		3.2	U	3.2	U	0.14	U				
Cis-1,3-Dichloropropene	ug/m3	0.73	U	0.73	U	0.73	U	0.36	U	0.36	U	7.3	U	7.3	U	0.16	U				
Cyclohexane	ug/m3	0.55	U	1		0.48	J	0.69	U	0.69	U	14	U	14	U	0.12	U				
Dibromochloromethane	ug/m3	0.68	U	0.68	U	0.68	U	0.68	U	0.68	U	14	U	14	U	0.3	U				
Dichlorodifluoromethane	ug/m3	2		1.9		2.1		0.9	J	0.93	J	7.9	U	7.9	U	1.1					
Ethanol	ug/m3	4110	J	3670	J	727	J	6700		6500		13000		15000		1900					

Table 1C
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - 2nd Floor
2015 through 2024

Location ID		2532-IA		2532-IA		2532-IA		2865E-IA		2865E-IA		2865E-IA		2865E-IA		2532-IA	
Sample ID		2532-IA-120818-01		2532-IA-120818-02		2532-IA-120818-03		2865E-IA-120420-03		2865E-IA-120420-04		2865E-IA-42221-03		2865E-IA-42221-04		2532-IA-040622-03	
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR		AIR	
Sample Date		12/8/2018		12/8/2018		12/8/2018		12/4/2020		12/4/2020		4/23/2021		4/23/2021		4/7/2022	
Sample Type Code		N		N		N		N		N		N		N		N	
Chemical Name	Unit																
Ethyl Acetate	ug/m3	3.6		5		0.5	J	-		-		-		-		9.6	
Ethylbenzene	ug/m3	0.65	J	3.3		0.48	J	0.43		0.35	U	6.9	U	6.9	U	0.16	
Hexachlorobutadiene	ug/m3	0.77	U	0.77	U	0.77	U	0.85	U	0.85	U	17	U	17	U	0.37	U
Isopropanol	ug/m3	185		258		1550	J	-		-		-		-		300	
m,p-Xylene	ug/m3			-		-		1.3		0.79		6.9	U	6.9	U	0.49	
Methyl Ethyl Ketone (2-Butanone)	ug/m3	2.5		2.3		0.65		5.9		7.2		19	U	19	U	4.1	U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ug/m3	0.66	U	0.66	U	0.66	U	1.1		0.86		16	U	16	U	0.14	U
Methyl Methacrylate	ug/m3	0.66	U	0.7		3.5		-		-		-		-		-	
Methylene Chloride	ug/m3	0.56	U	0.56	U	0.56	U	1.8		1.5		28	U	28	U	4.8	
M-P-Xylene	ug/m3	2.5		53		1.8		-		-		-		-		-	
Naphthalene	ug/m3			-		-		1	U	1	U	21	U	21	U	0.19	
N-Heptane	ug/m3	0.66	U	5.7		0.7		-		-		-		-		0.88	
N-Hexane	ug/m3	0.7		2.4		1.7		1.8		1.5		14	U	14	U	1.8	J
O-Xylene (1,2-Dimethylbenzene)	ug/m3	0.91		21		0.65	J	0.45		0.35	U	6.9	U	6.9	U	0.16	
Propylene	ug/m3	0.69	U	0.69	U	0.69	U	-		-		-		-		2.4	U
Styrene	ug/m3	0.39	J	0.51	J	0.68	U	0.34	U	0.34	U	6.8	U	6.8	U	0.15	U
Tert-Butyl Alcohol	ug/m3	1.7		0.55		0.49	U	5		6		19	UJ	19	UJ	-	
Tert-Butyl Methyl Ether	ug/m3	0.58	U	0.58	U	0.58	U	0.58	U	0.58	U	12	U	12	U	0.13	U
Tetrachloroethylene (PCE)	ug/m3	0.28		0.56		1		1		0.54	U	11	U	11	U	0.24	U
Tetrahydrofuran	ug/m3	0.47	U	0.47	U	0.47	U	-		-		-		-		1	U
Toluene	ug/m3	2.5		11		2.9		18		21		9	U	9	U	1	
Trans-1,2-Dichloroethene	ug/m3	0.63	U	0.63	U	0.63	U	0.32	U	0.32	U	6.3	U	6.3	U	0.14	U
Trans-1,3-Dichloropropene	ug/m3	0.73	U	0.73	U	0.73	U	0.36	U	0.36	U	7.3	U	7.3	U	0.16	U
Trichloroethylene (TCE)	ug/m3	0.17	U	0.23		0.54		3.3		0.22		3.9	U	3.9	U	0.19	U
Trichlorofluoromethane	ug/m3	2.5		2.6		6.7		2.9		3.1		9	UJ	9	UJ	1.7	
Vinyl Acetate	ug/m3	1.8		0.56	U	0.56	U	-		-		-		-		2.5	U
Vinyl Bromide	ug/m3	0.7	U	1.4		0.7	U	-		-		-		-		-	
Vinyl Chloride	ug/m3	3.3		3.3		3.6		0.62		0.71		2	U	2	U	0.11	
Xylenes	ug/m3	3.4		74.7		2.4		-		-		-		-		-	

Notes:
IA = Indoor Air
FF = First Floor
- = Indicates compound was not sampled for
N = Normal Sample
FD = Field Duplicate Sample
U = Not detected at the detection limit shown
J = Estimated value
UJ = Approximate non-detect
ug/m3 = microgram per cubic meter

Table 1C
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - 2nd Floor
2015 through 2024

Location ID		2532-IA		2532-IA		2532-IA		2532-IA		2532-IA	
Sample ID		2532-IA-040622-04		2532-IA-01202023-03		2532-IA-01202023-04		2532-IA-042324-05		2532-IA-042324-06	
Matrix		AIR		AIR		AIR		AIR		AIR	
Sample Date		4/7/2022		1/20/2023		1/20/2023		4/24/2024		4/24/2024	
Sample Type Code		N		N		N		N		N	
Chemical Name	Unit										
1,1,1-Trichloroethane (TCA)	ug/m3	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U
1,1,2,2-Tetrachloroethane	ug/m3	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/m3	1.1	U	0.34	J	1.1	U	0.4	J	0.41	J
1,1,2-Trichloroethane	ug/m3	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U
1,1-Dichloroethane	ug/m3	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
1,1-Dichloroethene	ug/m3	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
1,2,4-Trichlorobenzene	ug/m3	0.26	U	0.26	U	0.26	U	0.52	U	0.52	U
1,2,4-Trimethylbenzene	ug/m3	0.1	J	0.89		0.4		0.6		0.52	
1,2-Dibromoethane (Ethylene Dibromide)	ug/m3	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U
1,2-Dichlorobenzene	ug/m3	0.21	U	0.21	U	0.21	U	0.21	U	0.21	U
1,2-Dichloroethane	ug/m3	0.14	U	0.14	U	0.14	U	0.12	J	0.1	J
1,2-Dichloropropane	ug/m3	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
1,2-Dichlorotetrafluoroethane	ug/m3	0.25	U	0.25	U	0.25	U	0.11	J	0.11	J
1,3,5-Trimethylbenzene (Mesitylene)	ug/m3	0.17	U	0.17		0.17	U	0.15	J	0.17	U
1,3-Butadiene	ug/m3	0.078	U	0.078	U	0.11		-		-	
1,3-Dichlorobenzene	ug/m3	0.21	U	0.21	U	0.21	U	0.21	U	0.21	U
1,4-Dichlorobenzene	ug/m3	0.21	U	0.27		0.21	U	0.28		0.25	
1,4-Dioxane (P-Dioxane)	ug/m3	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
2,2,4-Trimethylpentane	ug/m3	-		-		-		0.38	J	0.33	J
2-Chlorotoluene	ug/m3	-		-		-		-		-	
2-Hexanone	ug/m3	0.14	U	0.14	U	0.16		-		-	
4-Ethyltoluene	ug/m3	0.17	U	0.21		0.17	U	-		-	
Acetone	ug/m3	23		37		26		-		-	
Allyl Chloride (3-Chloropropene)	ug/m3	-		-		-		-		-	
Benzene	ug/m3	0.13		1.2		0.67		0.66	J	0.56	J
Benzyl Chloride	ug/m3	0.18	U	0.18	U	0.18	U	0.36	UJ	0.36	UJ
Bromodichloromethane	ug/m3	0.24	U	0.24	U	0.24	U	0.23	U	0.23	U
Bromoform	ug/m3	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U
Bromomethane	ug/m3	0.14	U	0.1	J	0.14	U	0.14	U	0.14	U
Carbon Disulfide	ug/m3	0.28	J	0.12	J	1.1	U	-		-	
Carbon Tetrachloride	ug/m3	0.22	U	0.3		0.23		0.44	J	0.45	J
Chlorobenzene	ug/m3	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
Chloroethane	ug/m3	0.093	U	0.093	UJ	0.093	UJ	0.092	U	0.092	U
Chloroform	ug/m3	0.17	U	0.24		0.21		0.35		0.33	
Chloromethane	ug/m3	3.3		1.2		1.1		1.6		1.5	
Cis-1,2-Dichloroethylene	ug/m3	0.14	U	0.11	J	0.14	U	0.14	U	0.14	U
Cis-1,3-Dichloropropene	ug/m3	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
Cyclohexane	ug/m3	0.12	U	0.5		0.23		0.35		0.26	
Dibromochloromethane	ug/m3	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
Dichlorodifluoromethane	ug/m3	1.4		1.4		1.4		1.7		1.6	
Ethanol	ug/m3	2300		890		650		2000	J	2100	J

Table 1C
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - 2nd Floor
2015 through 2024

Location ID		2532-IA		2532-IA		2532-IA		2532-IA		2532-IA			
Sample ID		2532-IA-040622-04		2532-IA-01202023-03		2532-IA-01202023-04		2532-IA-042324-05		2532-IA-042324-06			
Matrix		AIR		AIR		AIR		AIR		AIR			
Sample Date		4/7/2022		1/20/2023		1/20/2023		4/24/2024		4/24/2024			
Sample Type Code		N		N		N		N		N			
Chemical Name	Unit												
Ethyl Acetate	ug/m3	4.2		58		2.3		-		-			
Ethylbenzene	ug/m3	0.15	U	1.2		0.35		0.6		0.53			
Hexachlorobutadiene	ug/m3	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U		
Isopropanol	ug/m3	180		1300		610		-		-			
m,p-Xylene	ug/m3	0.25	J	3.4		1.3		1.9		1.7			
Methyl Ethyl Ketone (2-Butanone)	ug/m3	4.1	U	4.1	U	4.1	U	4.1	U	4.1	U		
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ug/m3	0.14	U	0.14	U	0.098	J	0.14	U	0.14	U		
Methyl Methacrylate	ug/m3	-		-		-		-		-			
Methylene Chloride	ug/m3	3.1		1.2	UJ	1.2	UJ	0.38	J	0.39	J		
M-P-Xylene	ug/m3	-		-		-		-		-			
Naphthalene	ug/m3	0.18	U	0.2		0.18	U	0.27	J	0.24	J		
N-Heptane	ug/m3	0.12	J	0.91		0.53		0.85		0.71			
N-Hexane	ug/m3	4.9	U	3.8	J	1.6	J	4.9	U	4.9	U		
O-Xylene (1,2-Dimethylbenzene)	ug/m3	0.085	J	1		0.44		0.71		0.64			
Propylene	ug/m3	2.4	U	2.4	U	2.4	U						
Styrene	ug/m3	0.15	U	0.43		0.11	J	0.2		0.18			
Tert-Butyl Alcohol	ug/m3	-		-		-		0.33	J	0.39	J		
Tert-Butyl Methyl Ether	ug/m3	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U		
Tetrachloroethylene (PCE)	ug/m3	0.24	U	0.8		0.35		2.2		1.9			
Tetrahydrofuran	ug/m3	1	U	1	U	1	U						
Toluene	ug/m3	0.49		7.3		3.1		3.5		3			
Trans-1,2-Dichloroethene	ug/m3	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U		
Trans-1,3-Dichloropropene	ug/m3	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U		
Trichloroethylene (TCE)	ug/m3	0.19	U	0.13	J	0.19	U	0.19	U	0.19	U		
Trichlorofluoromethane	ug/m3	1.9		1.9		1.4		1.5		1.4			
Vinyl Acetate	ug/m3	2.5	U	2	J	1.3	J	-		-			
Vinyl Bromide	ug/m3	-		-		-		-		-			
Vinyl Chloride	ug/m3	0.14		0.09	U	0.09	U	0.089	U	0.089	U		
Xylenes	ug/m3	-		-		-		-		-			

Notes:
IA = Indoor Air
FF = First Floor
- = Indicates compound was not sampled for
N = Normal Sample
FD = Field Duplicate Sample
U = Not detected at the detection limit shown
J = Estimated value
UJ = Approximate non-detect
ug/m3 = microgram per cubic meter

Table 1D
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - Ambient/Outdoor
2015 through 2024

Location ID		AA		2865E-AA-01		2865E-0A-01		2865E-0A-02		2865E-0A-03		2865E-AA-01		2865E-0A-03		2865E-0A-03			
Sample ID		AA-033115		2865E-AA-091115-01		2865E-0A-091115-01		2865E-0A-091115-02		2865E-0A-091115-03		2865E-AA-0333116-01		2865E-0A-0333116-03		2865E-0A-0333116-04			
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR		AIR			
Sample Date		3/31/2015		9/11/2015		9/11/2015		9/11/2015		9/11/2015		3/31/2016		3/31/2016		3/31/2016			
Sample Type Code		N		N		N		N		N		N		N		FD			
Chemical Name	Unit																		
1,1,1-Trichloroethane (TCA)	ug/m3	0.034	U	0.034	U	0.034	U	0.034	U	0.034	U	0.034	U	0.034	U	0.034	U		
1,1,2,2-Tetrachloroethane	ug/m3	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U		
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/m3	0.41	J	0.72	J	0.74	J	0.7	J	0.73	J	0.63	J	0.59	J	0.6	J		
1,1,2-Trichloroethane	ug/m3	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U		
1,1-Dichloroethane	ug/m3	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U		
1,1-Dichloroethene	ug/m3	0.034	U	0.034	U	0.034	U	0.034	U	0.034	U	0.034	U	0.034	U	0.034	U		
1,2,4-Trichlorobenzene	ug/m3	0.098	U	0.098	U	0.098	U	0.098	U	0.098	U	0.098	U	0.098	U	0.098	U		
1,2,4-Trimethylbenzene	ug/m3	0.21	J+	0.78		0.82		0.69		0.8		0.042	U	0.042	U	0.042	U		
1,2-Dibromoethane (Ethylene Dibromide)	ug/m3	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U		
1,2-Dichlorobenzene	ug/m3	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U		
1,2-Dichloroethane	ug/m3	0.057	J	0.039	U	0.039	U	0.039	U	0.039	U	0.039	U	0.039	U	0.039	U		
1,2-Dichloropropane	ug/m3	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U		
1,2-Dichlorotetrafluoroethane	ug/m3	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U		
1,3,5-Trimethylbenzene (Mesitylene)	ug/m3	0.059	J	0.22		0.23		0.19		0.22		0.034	U	0.034	U	0.034	U		
1,3-Butadiene	ug/m3	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U		
1,3-Dichlorobenzene	ug/m3	0.047	U	0.047	U	0.047	U	0.047	U	0.047	U	0.047	U	0.047	U	0.047	U		
1,4-Dichlorobenzene	ug/m3	0.053	U	0.053	U	0.053	U	0.053	U	0.053	U	0.053	U	0.053	U	0.053	U		
1,4-Dioxane (P-Dioxane)	ug/m3	0.82	U	0.82	U	0.82	U	0.82	U	0.82	U	0.82	U	0.82	U	0.82	U		
2,2,4-Trimethylpentane	ug/m3	-		-		-		-		-		-		-		-			
2-Chlorotoluene	ug/m3	-		-		-		-		-		-		-		-			
2-Hexanone	ug/m3	0.36	J+	0.037	U	0.66		0.037	U	0.037	U	0.4		0.037	U	0.037	U		
4-Ethyltoluene	ug/m3	0.076	J	0.19		0.2		0.18		0.19		0.039	U	0.039	U	0.039	U		
Acetone	ug/m3	24		16		29		8.3		11		14		8.9		13			
Allyl Chloride (3-Chloropropene)	ug/m3	-		-		-		-		-		-		-		-			
Benzene	ug/m3	0.57		0.84		1.2		0.83		0.85		0.59		0.54		0.65			
Benzyl Chloride	ug/m3	0.035	UJ	0.035	UJ	0.035	UJ	0.035	UJ	0.035	UJ	0.035	U	0.035	U	0.035	U		
Bromodichloromethane	ug/m3	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U		
Bromoform	ug/m3	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U		
Bromomethane	ug/m3	0.094	UJ	0.094	U	0.094	U	0.094	U	0.094	U	0.094	U	0.094	U	0.094	U		
Carbon Disulfide	ug/m3	0.038	U	0.11	J	0.13	J	0.038	U	0.13	J	0.038	U	0.038	U	0.41	J		
Carbon Tetrachloride	ug/m3	0.55		0.49		0.48		0.48		0.49		0.57		0.57		0.67			
Chlorobenzene	ug/m3	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U		
Chloroethane	ug/m3	0.035	U	0.035	U	0.035	U	0.035	U	0.035	U	0.035	U	0.035	U	0.035	U		
Chloroform	ug/m3	0.065	J	0.35		0.37		0.34		0.37		0.04	U	0.04	U	0.04	U		
Chloromethane	ug/m3	1.1		0.9		0.98		0.93		0.92		1.3		1.3		1.4			
Cis-1,2-Dichloroethylene	ug/m3	0.053	J	0.053	U	0.053	U	0.053	U	0.19		0.053	U	0.053	U	0.053	U		
Cis-1,3-Dichloropropene	ug/m3	0.042	U	0.042	U	0.042	U	0.042	U	0.042	U	0.042	U	0.042	U	0.042	U		
Cyclohexane	ug/m3	0.069	U	0.39		0.4		0.33		0.35		0.069	U	0.069	U	0.069	U		
Dibromochloromethane	ug/m3	0.08	U	0.08	U	0.08	U	0.08	U	0.08	U	0.08	U	0.08	U	0.08	U		
Dichlorodifluoromethane	ug/m3	0.61	J	2.1		2		2		2		1.9		2.1		1.9			
Ethanol	ug/m3	7.9		18		17		17		13		6.2	J+	5.8	J+	6.7	J+		

Table 1D
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - Ambient/Outdoor
2015 through 2024

Location ID		AA		2865E-AA-01		2865E-0A-01		2865E-0A-02		2865E-0A-03		2865E-AA-01		2865E-0A-03		2865E-0A-03			
Sample ID		AA-033115		2865E-AA-091115-01		2865E-0A-091115-01		2865E-0A-091115-02		2865E-0A-091115-03		2865E-AA-0333116-01		2865E-0A-0333116-03		2865E-0A-0333116-04			
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR		AIR			
Sample Date		3/31/2015		9/11/2015		9/11/2015		9/11/2015		9/11/2015		3/31/2016		3/31/2016		3/31/2016			
Sample Type Code		N		N		N		N		N		N		N		FD			
Chemical Name	Unit																		
Ethyl Acetate	ug/m3	1.1		1.1		0.77		0.74		0.8		1.2	J+	2.1	J+	1.7	J+		
Ethylbenzene	ug/m3	0.33		0.64		0.7		0.59		0.62		0.042	U	0.042	U	0.042	U		
Hexachlorobutadiene	ug/m3	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U		
Isopropanol	ug/m3	4		3.6	J	7.4	J	8.2	J	9.7	J	4.5	J	6	J	6.5	J		
m,p-Xylene	ug/m3	2		2.5		2.7		2.3		2.5		0.49		0.42		0.41			
Methyl Ethyl Ketone (2-Butanone)	ug/m3	2.2	J	1.3	J	6.6		1.5	J	1.3	J	2.7	J	0.79	J	1.5	J		
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ug/m3	0.034	U	0.034	U	0.42		0.25		0.034	U	0.21		0.034	U	0.15			
Methyl Methacrylate	ug/m3	-		-		-		-		-		-		-		-			
Methylene Chloride	ug/m3	1.8		1.5		1.2		1.2	J	1.3		0.44	J	0.41	J	0.65	J		
M-P-Xylene	ug/m3	-		-		-		-		-		-		-		-			
Naphthalene	ug/m3	0.1	U	0.42		0.43		0.37		0.46		0.1	U	0.1	U	0.1	U		
N-Heptane	ug/m3	0.24	J	0.87		0.89		0.81		0.8		0.29		0.26		0.3			
N-Hexane	ug/m3	7.6	J	1.2	J	1.3	J	1	J	1.1	J	0.38	J	0.38	J	0.4	J		
O-Xylene (1,2-Dimethylbenzene)	ug/m3	0.65	J+	0.92		1		0.85		0.9		0.2		0.17		0.17			
Propylene	ug/m3	0.18	U	0.18	U	3.7		0.18	U	0.18	U	0.18	U	0.18	U	0.18	U		
Styrene	ug/m3	0.033	J	0.029	U	0.029	U	0.029	U	0.029	U	0.029	U	0.029	U	0.029	U		
Tert-Butyl Alcohol	ug/m3	0.23	U	0.22	J	1.4		0.25	J	0.27	J	0.31	J	0.16	U	0.27	J		
Tert-Butyl Methyl Ether	ug/m3	0.039	U	0.039	UJ	0.039	UJ	0.039	UJ	0.039	UJ	0.039	U	0.039	U	0.039	U		
Tetrachloroethylene (PCE)	ug/m3	0.64		1.5		2.3		3.2		4.5		1.5		1.1		1.6			
Tetrahydrofuran	ug/m3	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U		
Toluene	ug/m3	1.6		3.3		3.5		3		3.1		1		0.87		0.91			
Trans-1,2-Dichloroethene	ug/m3	0.037	U	0.037	U	0.037	U	0.037	U	0.037	U	0.037	U	0.037	U	0.037	U		
Trans-1,3-Dichloropropene	ug/m3	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U		
Trichloroethylene (TCE)	ug/m3	0.1	J	0.45		0.51		0.54		0.66		0.25		0.23		0.35			
Trichlorofluoromethane	ug/m3	1		1.5		1.5		1.5		1.5		1.3		1.4		1.5			
Vinyl Acetate	ug/m3	0.063	UJ	0.063	U	0.063	U	0.063	U	0.063	U	0.063	U	0.063	U	0.063	U		
Vinyl Bromide	ug/m3	-		-		-		-		-		-		-		-			
Vinyl Chloride	ug/m3	0.038	U	0.038	U	0.038	U	0.038	U	0.038	U	0.038	U	0.038	U	0.038	U		
Xylenes	ug/m3	-		-		-		-		-		-		-		-			

Notes:
OA = Outdoor Air
- = Indicates compound was not sampled for
N = Normal Sample
FD = Field Duplicate Sample
U = Not detected at the detection limit shown
J = Estimated value
UJ = Approximate non-detect
J+ = Estimate biased high
ug/m3 = microgram per cubic meter

Table 1D
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - Ambient/Outdoor
2015 through 2024

Location ID		2865E-AA-01		2865E-AA-01		2865E-0A-02		2865E-0A-03		2865E-0A-03		2532-0A		2532-0A		2532-0A					
Sample ID		2865E-AA-081816-01		2865E-AA-111716-01		2865E-0A-111716-02		2865E-0A-081816-03		2865E-0A-111716-03		2532-0A-120818-01		2532-0A-01202023-01		2532-0A-040622-06					
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR		AIR					
Sample Date		8/19/2016		11/18/2016		11/18/2016		8/19/2016		11/18/2016		12/8/2018		1/20/2023		4/7/2022					
Sample Type Code		N		N		N		N		N		N		N		N					
Chemical Name	Unit																				
1,1,1-Trichloroethane (TCA)	ug/m3	0.034	U	0.37		0.11	J	0.034	U	0.29		0.44	U	0.19	U	0.19	U				
1,1,2,2-Tetrachloroethane	ug/m3	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U	0.55	U	0.24	U	0.24	U				
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/m3	0.58	J	0.57	J	0.62	J	0.65	J	0.62	J	0.61	U	0.47	J	0.89	J				
1,1,2-Trichloroethane	ug/m3	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U	0.44	U	0.19	U	0.19	U				
1,1-Dichloroethane	ug/m3	0.04	U	0.11	J	0.04	U	0.04	U	0.1	J	0.65	U	0.14	U	0.14	U				
1,1-Dichloroethene	ug/m3	0.034	U	0.19		0.05	J	0.034	U	0.16		0.13	U	0.14	U	0.14	U				
1,2,4-Trichlorobenzene	ug/m3	0.098	U	0.098	U	0.098	U	0.098	U	0.098	U	0.59	U	0.26	U	0.26	U				
1,2,4-Trimethylbenzene	ug/m3	0.29		0.57		0.56		0.46		0.53		0.79	U	0.16	J	0.13	J				
1,2-Dibromoethane (Ethylene Dibromide)	ug/m3	0.06	U	0.06	U	0.06	U	0.06	U	0.06	U	19		0.27	U	0.27	U				
1,2-Dichlorobenzene	ug/m3	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.19	U	0.21	U	0.21	U				
1,2-Dichloroethane	ug/m3	0.039	U	0.039	U	0.043	J	0.039	U	0.039	U	0.77		0.14	U	0.14	U				
1,2-Dichloropropane	ug/m3	0.056	UJ	0.056	U	0.056	U	0.056	UJ	0.056	U	0.74	U	0.16	U	0.16	U				
1,2-Dichlorotetrafluoroethane	ug/m3	0.058	U	0.058	U	0.058	U	0.058	U	0.058	U	0.56	U	0.25	U	0.25	U				
1,3,5-Trimethylbenzene (Mesitylene)	ug/m3	0.079	J	0.16	J	0.16	J	0.097	J	0.16	J	0.79	U	0.17	U	0.17	U				
1,3-Butadiene	ug/m3	0.04	U	0.23	J	0.2	J	0.04	U	0.38	J	0.35	U	0.065	J	0.078	U				
1,3-Dichlorobenzene	ug/m3	0.047	U	0.047	U	0.047	U	0.047	U	0.047	U	0.48	U	0.21	U	0.21	U				
1,4-Dichlorobenzene	ug/m3	0.053	U	0.053	U	0.053	U	0.093	J	0.053	U	0.48	U	0.21	U	0.21	U				
1,4-Dioxane (P-Dioxane)	ug/m3	0.82	U	0.82	U	0.82	U	0.82	U	0.82	U	0.58	U	1.3	U	1.3	U				
2,2,4-Trimethylpentane	ug/m3	-		-		-		-		-		0.75	U	-		-					
2-Chlorotoluene	ug/m3	-		-		-		-		-		0.83	U	-		-					
2-Hexanone	ug/m3	0.44	J	0.68		0.5		0.38	J	0.037	U	0.65	U	0.29		0.14	U				
4-Ethyltoluene	ug/m3	0.069	J	0.14	J	0.13	J	0.09	J	0.13	J	0.79	U	0.17	U	0.17	U				
Acetone	ug/m3	18		29		21		40		15		8.1		5.7		16					
Allyl Chloride (3-Chloropropene)	ug/m3	-		-		-		-		-		0.5	U	-		-					
Benzene	ug/m3	0.31		1.2		1.1		0.52		1.1		0.58		0.59		0.53					
Benzyl Chloride	ug/m3	0.035	U	0.035	U	0.035	U	0.035	U	0.035	U	0.82	UJ	0.18	U	0.18	U				
Bromodichloromethane	ug/m3	0.051	U	0.051	U	0.051	U	0.051	U	0.051	U	0.54	U	0.24	U	0.24	U				
Bromoform	ug/m3	0.07	U	0.07	U	0.07	U	0.07	U	0.07	U	0.33	U	0.36	U	0.36	U				
Bromomethane	ug/m3	0.094	U	0.094	U	0.094	U	0.094	U	0.094	U	0.62	U	0.14	U	0.14	U				
Carbon Disulfide	ug/m3	0.038	U	0.38	J	0.24	J	0.22	J	0.57	J	0.5	U	1.1	U	1.1	U				
Carbon Tetrachloride	ug/m3	0.43		0.49		0.47		0.47		0.47		0.43		0.45		0.67					
Chlorobenzene	ug/m3	0.056	U	0.056	U	0.056	U	0.056	U	0.056	U	0.74	U	0.16	U	0.16	U				
Chloroethane	ug/m3	0.035	U	0.035	U	0.035	U	0.035	U	0.035	U	0.42	U	0.093	UJ	0.093	U				
Chloroform	ug/m3	0.11	J	0.19		0.17		0.12	J	0.17	J	0.78	U	0.17	U	0.42					
Chloromethane	ug/m3	1.6	J+	1.4	J	1.6	J	1.4		1.5	J	0.93		0.85		1.9					
Cis-1,2-Dichloroethylene	ug/m3	0.053	U	0.16		0.15		0.16		0.14		0.13	U	0.14	U	0.14	U				
Cis-1,3-Dichloropropene	ug/m3	0.042	U	0.042	U	0.042	U	0.042	U	0.042	U	0.73	U	0.16	U	0.16	U				
Cyclohexane	ug/m3	0.069	U	0.069	U	0.069	U	0.29		0.069	U	0.55	U	0.075	J	0.12	U				
Dibromochloromethane	ug/m3	0.08	U	0.08	U	0.08	U	0.08	U	0.08	U	0.68	U	0.3	U	0.3	U				
Dichlorodifluoromethane	ug/m3	0.93	J	0.74		0.88		0.66	J	0.7		1.8		1.3		2					
Ethanol	ug/m3	13		21		27		240		18		4.7		5.2	J	8.2					

Table 1D
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - Ambient/Outdoor
2015 through 2024

Location ID		2865E-AA-01		2865E-AA-01		2865E-0A-02		2865E-0A-03		2865E-0A-03		2532-0A		2532-0A		2532-0A					
Sample ID		2865E-AA-081816-01		2865E-AA-111716-01		2865E-0A-111716-02		2865E-0A-081816-03		2865E-0A-111716-03		2532-0A-120818-01		2532-0A-01202023-01		2532-0A-040622-06					
Matrix		AIR		AIR		AIR		AIR		AIR		AIR		AIR		AIR					
Sample Date		8/19/2016		11/18/2016		11/18/2016		8/19/2016		11/18/2016		12/8/2018		1/20/2023		4/7/2022					
Sample Type Code		N		N		N		N		N		N		N		N					
Chemical Name	Unit																				
Ethyl Acetate	ug/m3	0.53		0.4		0.49		0.82		0.35		0.58	U	1.3	U	0.64	J				
Ethylbenzene	ug/m3	0.18		0.43		0.42		0.23		0.38		0.69	U	0.13	J	0.13	J				
Hexachlorobutadiene	ug/m3	0.14	UJ	0.14	U	0.14	U	0.14	U	0.14	U	0.77	U	0.37	U	0.37	U				
Isopropanol	ug/m3	14		12		18		580		14		0.79		0.9	J	27					
m,p-Xylene	ug/m3	0.67		1.6		1.6		0.89		1.5		-		0.39		0.42					
Methyl Ethyl Ketone (2-Butanone)	ug/m3	3	J	3.7	J	2.7	J	3	J	1.5	J	1		1.3	J	4.1	U				
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ug/m3	0.16		0.23		0.034	U	0.078	J	0.034	U	0.66	U	0.14	U	0.14	U				
Methyl Methacrylate	ug/m3	-		-		-		-		-		0.66	U	-		-					
Methylene Chloride	ug/m3	0.74	J	0.96	J	0.79	J	1.2	J	0.7	J	0.56	U	1.2	UJ	4					
M-P-Xylene	ug/m3	-		-		-		-		-		0.56	J	-		-					
Naphthalene	ug/m3	0.23	J	0.24		0.19		0.19	J	0.19		-		0.18	U	0.18	U				
N-Heptane	ug/m3	0.27		0.68		0.67		0.31		0.82		0.66	U	0.23		0.19					
N-Hexane	ug/m3	0.96	J	1.3	J	1.3	J	1.6	J	1.6	J	0.39	J	4.9	U	4.3	J				
O-Xylene (1,2-Dimethylbenzene)	ug/m3	0.26		0.68		0.66		0.33		0.62		0.69	U	0.3		0.17					
Propylene	ug/m3	0.18	UJ	0.18	UJ	0.18	UJ	0.18	UJ	0.18	UJ	0.89		2.4	U	2.4	U				
Styrene	ug/m3	0.045	J	0.12	J	0.12	J	0.039	J	0.11	J	0.68	U	0.15	U	0.13	J				
Tert-Butyl Alcohol	ug/m3	0.16	U	1.1		0.45		0.16	U	0.16	U	0.49	U	-		-					
Tert-Butyl Methyl Ether	ug/m3	0.039	U	0.039	U	0.039	U	0.039	U	0.081	J	0.58	U	0.13	U	0.13	U				
Tetrachloroethylene (PCE)	ug/m3	2.4		0.64		0.59		2.1		0.9		0.47		0.24	U	0.37					
Tetrahydrofuran	ug/m3	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U	0.74		1	U	1	U				
Toluene	ug/m3	1.6		4		3.6		1.9		3.6		1		0.8		0.97					
Trans-1,2-Dichloroethene	ug/m3	0.037	U	0.037	U	0.037	U	0.037	U	0.037	U	0.63	U	0.14	U	0.14	U				
Trans-1,3-Dichloropropene	ug/m3	0.043	U	0.043	U	0.043	U	0.043	U	0.043	U	0.73	U	0.16	U	0.16	U				
Trichloroethylene (TCE)	ug/m3	0.11	J	0.25		0.22		0.12	J	0.22		0.17	U	0.19	U	0.13	J				
Trichlorofluoromethane	ug/m3	1.3		1.2		1.3		1.5		1.3		1.1		1		2.4					
Vinyl Acetate	ug/m3	0.063	UJ	0.063	U	0.063	U	0.063	UJ	0.063	U	0.56	U	1	J	2.5	U				
Vinyl Bromide	ug/m3	-		-		-		-		-		1		-		-					
Vinyl Chloride	ug/m3	0.038	U	0.072	J	0.056	J	0.038	U	0.09		0.082	U	0.09	U	0.09	U				
Xylenes	ug/m3	-				-		-		-		0.56	J	-		-					

Notes:
OA = Outdoor Air
- = Indicates compound was not sampled for
N = Normal Sample
FD = Field Duplicate Sample
U = Not detected at the detection limit shown
J = Estimated value
UJ = Approximate non-detect
J+ = Estimate biased high
ug/m3 = microgram per cubic meter

Table 1D
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - Ambient/Outdoor
2015 through 2024

	Location ID	2532-0A	
	Sample ID	2532-0A-042324-01	
	Matrix	AIR	
	Sample Date	4/24/2024	
	Sample Type Code	N	
Chemical Name	Unit		
1,1,1-Trichloroethane (TCA)	ug/m3	0.19	U
1,1,2,2-Tetrachloroethane	ug/m3	0.24	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/m3	0.37	J
1,1,2-Trichloroethane	ug/m3	0.19	U
1,1-Dichloroethane	ug/m3	0.14	U
1,1-Dichloroethene	ug/m3	0.14	U
1,2,4-Trichlorobenzene	ug/m3	0.52	U
1,2,4-Trimethylbenzene	ug/m3	0.17	U
1,2-Dibromoethane (Ethylene Dibromide)	ug/m3	0.27	U
1,2-Dichlorobenzene	ug/m3	0.21	U
1,2-Dichloroethane	ug/m3	0.073	J
1,2-Dichloropropane	ug/m3	0.16	U
1,2-Dichlorotetrafluoroethane	ug/m3	0.12	J
1,3,5-Trimethylbenzene (Mesitylene)	ug/m3	0.17	U
1,3-Butadiene	ug/m3	-	
1,3-Dichlorobenzene	ug/m3	0.21	U
1,4-Dichlorobenzene	ug/m3	0.21	U
1,4-Dioxane (P-Dioxane)	ug/m3	1.3	U
2,2,4-Trimethylpentane	ug/m3	0.44	U
2-Chlorotoluene	ug/m3	-	
2-Hexanone	ug/m3	-	
4-Ethyltoluene	ug/m3	-	
Acetone	ug/m3	-	
Allyl Chloride (3-Chloropropene)	ug/m3	-	
Benzene	ug/m3	0.18	J
Benzyl Chloride	ug/m3	0.36	UJ
Bromodichloromethane	ug/m3	0.23	U
Bromoform	ug/m3	0.36	U
Bromomethane	ug/m3	0.14	U
Carbon Disulfide	ug/m3	-	
Carbon Tetrachloride	ug/m3	0.46	J
Chlorobenzene	ug/m3	0.16	U
Chloroethane	ug/m3	0.092	U
Chloroform	ug/m3	0.17	U
Chloromethane	ug/m3	1.2	
Cis-1,2-Dichloroethylene	ug/m3	0.14	U
Cis-1,3-Dichloropropene	ug/m3	0.16	U
Cyclohexane	ug/m3	0.12	U
Dibromochloromethane	ug/m3	0.3	U
Dichlorodifluoromethane	ug/m3	1.7	
Ethanol	ug/m3	6.3	

Table 1D
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building
Cummulative Soil Vapor Results TO-15 - Ambient/Outdoor
2015 through 2024

	Location ID	2532-0A	
	Sample ID	2532-0A-042324-01	
	Matrix	AIR	
	Sample Date	4/24/2024	
	Sample Type Code	N	
Chemical Name	Unit		
Ethyl Acetate	ug/m3	-	
Ethylbenzene	ug/m3	0.058	J
Hexachlorobutadiene	ug/m3	0.37	U
Isopropanol	ug/m3	-	
m,p-Xylene	ug/m3	0.18	J
Methyl Ethyl Ketone (2-Butanone)	ug/m3	4.1	U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ug/m3	0.14	U
Methyl Methacrylate	ug/m3	-	
Methylene Chloride	ug/m3	0.37	J
M-P-Xylene	ug/m3	-	
Naphthalene	ug/m3	0.23	J
N-Heptane	ug/m3	0.25	
N-Hexane	ug/m3	4.9	U
O-Xylene (1,2-Dimethylbenzene)	ug/m3	0.067	J
Propylene	ug/m3	-	
Styrene	ug/m3	0.15	U
Tert-Butyl Alcohol	ug/m3	0.44	U
Tert-Butyl Methyl Ether	ug/m3	0.13	U
Tetrachloroethylene (PCE)	ug/m3	0.24	U
Tetrahydrofuran	ug/m3	-	
Toluene	ug/m3	0.33	
Trans-1,2-Dichloroethene	ug/m3	0.14	U
Trans-1,3-Dichloropropene	ug/m3	0.16	U
Trichloroethylene (TCE)	ug/m3	0.19	U
Trichlorofluoromethane	ug/m3	1.2	
Vinyl Acetate	ug/m3		
Vinyl Bromide	ug/m3	-	
Vinyl Chloride	ug/m3	0.089	U
Xylenes	ug/m3	-	

Notes:
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- = Indicates compound was not sampled for
N = Normal Sample
FD = Field Duplicate Sample
U = Not detected at the detection limit shown
J = Estimated value
UJ = Approximate non-detect
J+ = Estimate biased high
ug/m3 = microgram per cubic meter

Table 2
Time 1-Hour Cleaners
Interim Remedial Measure Costs

Interim Remedial Measure	Cost	Total Recurring Costs	Comment
SVE System (NES)			
NES SVE System Procurement	$32,000	-	
SVE/PVE Well and Mechanical Installation	$11,662	-	
Liquid Waste Disposal	$6,931	-	
Materials	$7,714	-	
Electrical Costs	-	$90	Monthly
Electrical Upgrade			
M&M Electrical	$15,750	-	Licensed electrical contractor
Labor	$3,500	-	
Materials	$2,000	-	
Sewer Rehab			
DV Brown	$8,500	-	Licensed plumbing contractor
Labor	$3,500	-	
Materials	$1,400	-	
Site Drainage Renovation			
Labor	$11,053	-	
Materials	$4,525	-	
APUs			
Slyvane Air Purifiers (4 Units)	$4,000	-	
Filters	-	$1,600	Quarterly filter replacement
Air Pura Air Purifyers (3 units)	$6,600	-	
Filters	-	$2,750	Quarterly filter replacement
Labor	$4,000	$2,000	Quarterly filter replacement
Waste Management			
Liquid Waste Disposal	$5,100	-	
Solid Waste Disposal	$7,500	-	
Labor	$5,000	-	
Materials	$3,500	-	
Basement Sealing			
Labor	$8,500	-	
Materials	$3,500	-	
Total Costs:	**$156,235**	**$6,440**	

Table 3A
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building SVE System
Solid Waste Characterization Results

Sample ID		PINEAVE-010-03		PINEAVE-010-04		PINE AVE-011-01		PINE AVE-011-02		IDW SOLID_091119_1		IDW SOLID_091119_2		IDW SOLID_121319-01	
Matrix		IDW		IDW		IDW		IDW		IDW		IDW		IDW	
SDG		JC90936		JC90936		JC94178		JC94178		JC94844		JC94844		JD349	
Sample Date		6/28/2019		6/28/2019		8/29/2019		8/29/2019		9/11/2019		9/11/2019		12/13/2019	
Sample Type Code		WC		WC		WC		WC		WC		WC		WC	
Chemical Name	Unit														
TCLP VOCs															
1,1-Dichloroethene	mg/l	0.005	U	0.005	U	-		-		-		-		0.005	U
1,2-Dichloroethane	mg/l	0.005	U	0.005	U	-		-		-		-		0.005	U
1,4-Dichlorobenzene	mg/l	0.02	U	0.02	U	-		-		-		-		0.02	U
Benzene	mg/l	0.0025	U	0.0025	U	-		-		-		-		0.0025	U
Carbon Tetrachloride	mg/l	0.005	U	0.005	U	-		-		-		-		0.005	U
Chlorobenzene	mg/l	0.005	U	0.005	U	-		-		-		-		0.005	U
Chloroform	mg/l	0.005	U	0.005	U	-		-		-		-		0.005	U
Methyl Ethyl Ketone (2-Butanone)	mg/l	0.1	U	0.1	U	-		-		-		-		0.1	U
Tetrachloroethylene (PCE)	mg/l	1.68		3.67		-		-		-		-		0.005	U
Trichloroethylene (TCE)	mg/l	0.046		0.144		-		-		-		-		0.005	U
Vinyl Chloride	mg/l	0.005	U	0.005	U	-		-		-		-		0.005	U
Total VOCs															
1,1,1-Trichloroethane (TCA)	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
1,1,2,2-Tetrachloroethane	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/kg	-		-		-		-		7.9	U	5.3	U	-	
1,1,2-Trichloroethane	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
1,1-Dichloroethane	ug/kg	-		-		-		-		1.6	U	1.1	U	-	
1,1-Dichloroethene	ug/kg	-		-		-		-		1.6	U	1.1	U	-	
1,2-Dibromo-3-Chloropropane	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
1,2-Dibromoethane (Ethylene Dibromide)	ug/kg	-		-		-		-		1.6	U	1.1	U	-	
1,2-Dichlorobenzene	ug/kg	-		-		-		-		1.6	U	1.1	U	-	
1,2-Dichloroethane	ug/kg	-		-		-		-		1.6	U	1.1	U	-	
1,2-Dichloropropane	ug/kg	-		-		-		-		3.2	U	1.1	J	-	
1,3-Dichlorobenzene	ug/kg	-		-		-		-		1.6	U	1.1	U	-	
1,4-Dichlorobenzene	ug/kg	-		-		-		-		1.6	U	1.1	U	-	
2-Hexanone	ug/kg	-		-		-		-		7.9	U	5.3	U	-	
Acetone	ug/kg	-		-		-		-		16	U	11	U	-	
Benzene	ug/kg	-		-		-		-		0.79	U	0.53	U	-	
Bromochloromethane	ug/kg	-		-		-		-		7.9	U	5.3	U	-	
Bromodichloromethane	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
Bromoform	ug/kg	-		-		-		-		7.9	U	5.3	U	-	
Bromomethane	ug/kg	-		-		-		-		7.9	U	5.3	U	-	
Carbon Disulfide	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
Carbon Tetrachloride	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
Chlorobenzene	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
Chloroethane	ug/kg	-		-		-		-		7.9	U	5.3	U	-	
Chloroform	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
Chloromethane	ug/kg	-		-		-		-		7.9	U	5.3	U	-	

Table 3A
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building SVE System
Solid Waste Characterization Results

Sample ID		PINEAVE-010-03		PINEAVE-010-04		PINE AVE-011-01		PINE AVE-011-02		IDW SOLID_091119_1		IDW SOLID_091119_2		IDW SOLID_121319-01	
Matrix		IDW		IDW		IDW		IDW		IDW		IDW		IDW	
SDG		JC90936		JC90936		JC94178		JC94178		JC94844		JC94844		JD349	
Sample Date		6/28/2019		6/28/2019		8/29/2019		8/29/2019		9/11/2019		9/11/2019		12/13/2019	
Sample Type Code		WC		WC		WC		WC		WC		WC		WC	
Chemical Name	Unit														
Cis-1,2-Dichloroethylene	ug/kg	-		-		-		-		3170		82.9		-	
Cis-1,3-Dichloropropene	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
Cyclohexane	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
Dibromochloromethane	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
Dichlorodifluoromethane	ug/kg	-		-		-		-		7.9	U	5.3	U	-	
Ethylbenzene	ug/kg	-		-		-		-		1.6	U	1.1	U	-	
Isopropylbenzene (Cumene)	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
M,P-Xylene (Sum Of Isomers)	ug/kg	-		-		-		-		1.6	U	1.1	U	-	
Methyl Acetate	ug/kg	-		-		-		-		7.9	U	5.3	U	-	
Methyl Ethyl Ketone (2-Butanone)	ug/kg	-		-		-		-		16	U	11	U	-	
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ug/kg	-		-		-		-		7.9	U	5.3	U	-	
Methylcyclohexane	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
Methylene Chloride	ug/kg	-		-		-		-		7.9	U	5.3	U	-	
O-Xylene (1,2-Dimethylbenzene)	ug/kg	-		-		-		-		1.6	U	1.1	U	-	
Styrene	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
Tert-Butyl Methyl Ether	ug/kg	-		-		-		-		1.6	U	1.1	U	-	
Tetrachloroethylene (PCE)	ug/kg	-		-		-		-		85.2		62.3		-	
Toluene	ug/kg	-		-		-		-		1.6	U	1.1	U	-	
Trans-1,2-Dichloroethene	ug/kg	-		-		-		-		0.99	J	2.2		-	
Trans-1,3-Dichloropropene	ug/kg	-		-		-		-		3.2	U	2.1	U	-	
Trichloroethylene (TCE)	ug/kg	-		-		-		-		10.8		21.7		-	
Trichlorofluoromethane	ug/kg	-		-		-		-		7.9	U	5.3	U	-	
Vinyl Chloride	ug/kg	-		-		-		-		3.2	U	0.91	J	-	
Xylenes	ug/kg	-		-		-		-		1.6	U	1.1	U	-	
SVOCs															
2,4,5-Trichlorophenol	mg/l	0.05	U	0.05	U	-		-		-		-		0.05	U
2,4,6-Trichlorophenol	mg/l	0.05	U	0.05	U	-		-		-		-		0.05	U
2,4-Dinitrotoluene	mg/l	0.02	U	0.02	U	-		-		-		-		0.02	U
2-Methylphenol (O-Cresol)	mg/l	0.02	U	0.02	U	-		-		-		-		0.02	U
4-Methylphenol (P-Cresol)	mg/l	-		-		-		-		-		-		-	
Chlordane	mg/l	0.0033	U	0.0033	U	-		-		-		-		-	
Cresols, M & P	mg/l	0.02	U	0.02	U	-		-		-		-		0.02	U
Hexachlorobenzene	mg/l	0.02	U	0.02	U	-		-		-		-		0.02	U
Hexachlorobutadiene	mg/l	0.01	U	0.01	U	-		-		-		-		0.01	U
Hexachloroethane	mg/l	0.05	U	0.05	U	-		-		-		-		0.05	U
Nitrobenzene	mg/l	0.02	U	0.02	U	-		-		-		-		0.02	U
Pentachlorophenol	mg/l	0.1	U	0.1	U	-		-		-		-		0.1	U
Pyridine	mg/l	0.02	U	0.02	U	-		-		-		-		0.02	U
1,2,3-Trichlorobenzene	ug/kg	-		-		-		-		7.9	U	5.3	U	-	

Table 3A
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building SVE System
Solid Waste Characterization Results

Sample ID		PINEAVE-010-03		PINEAVE-010-04		PINE AVE-011-01		PINE AVE-011-02		IDW SOLID_091119_1		IDW SOLID_091119_2		IDW SOLID_121319-01	
Matrix		IDW		IDW		IDW		IDW		IDW		IDW		IDW	
SDG		JC90936		JC90936		JC94178		JC94178		JC94844		JC94844		JD349	
Sample Date		6/28/2019		6/28/2019		8/29/2019		8/29/2019		9/11/2019		9/11/2019		12/13/2019	
Sample Type Code		WC		WC		WC		WC		WC		WC		WC	
Chemical Name	Unit														
1,2,4-Trichlorobenzene	ug/kg	-		-		-		-		7.9	U	5.3	U	-	
Total Metals															
Aluminum	mg/kg	-		-		22600		30900		-		-		-	
Antimony	mg/kg	-		-		2.6	U	2.5	U	-		-		-	
Arsenic	mg/kg	-		-		8.4		10.8	J	-		-		-	
Barium	mg/kg	-		-		200		205		-		-		-	
Beryllium	mg/kg	-		-		1.2		1.7		-		-		-	
Cadmium	mg/kg	-		-		0.55	J	3.1	U	-		-		-	
Calcium	mg/kg	-		-		18300		48600		-		-		-	
Chromium, Total	mg/kg	-		-		80.7		72		-		-		-	
Cobalt	mg/kg	-		-		17.6		15.1		-		-		-	
Copper	mg/kg	-		-		33.9		28.4		-		-		-	
Iron	mg/kg	-		-		38000		62900		-		-		-	
Lead	mg/kg	-		-		93.9		11.8		-		-		-	
Magnesium	mg/kg	-		-		10000		13100		-		-		-	
Manganese	mg/kg	-		-		996		511		-		-		-	
Mercury	mg/kg	-		-		0.82		0.043	U	-		-		-	
Nickel	mg/kg	-		-		38.2		39.3		-		-		-	
Potassium	mg/kg	-		-		3380		4720		-		-		-	
Selenium	mg/kg	-		-		5.2	U	13	U	-		-		-	
Silver	mg/kg	-		-		1.3	U	3.1	U	-		-		-	
Sodium	mg/kg	-		-		330	J	685	J	-		-		-	
Thallium	mg/kg	-		-		2.6	U	6.3	U	-		-		-	
Vanadium	mg/kg	-		-		40.2		46.4		-		-		-	
Zinc	mg/kg	-		-		191		57.5		-		-		-	
TCLP Metals															
Arsenic	mg/l	0.5	U	0.5	U	-		-		-		-		0.5	U
Barium	mg/l	1		1		-		-		-		-		0.65	J
Cadmium	mg/l	0.02	U	0.02	U	-		-		-		-		0.02	U
Chromium, Total	mg/l	0.05	U	0.05	U	-		-		-		-		0.039	J
Lead	mg/l	0.5	U	0.013	J	-		-		-		-		0.5	U
Mercury	mg/l	0.0002	U	0.0002	U	-		-		-		-		0.0002	U
Selenium	mg/l	0.5	U	0.5	U	-		-		-		-		0.5	U
Silver	mg/l	0.011	J	0.011	J	-		-		-		-		0.05	U
Other/RCRA															
Solids, Percent	%	83.6		82.1		75.4		75.8		73.4		76.8		77	
Ignitability	deg f	200	U	200	U	-		-		-		-		200	U
Reactive Cyanide	mg/kg	-		-		-		-		-		-		-	
Reactivity	mg/kg	12	U	12	U	-		-		-		-		13	U

Table 3A
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building SVE System
Solid Waste Characterization Results

Sample ID		PINEAVE-010-03		PINEAVE-010-04		PINE AVE-011-01		PINE AVE-011-02		IDW SOLID_091119_1		IDW SOLID_091119_2		IDW SOLID_121319-01	
Matrix		IDW		IDW		IDW		IDW		IDW		IDW		IDW	
SDG		JC90936		JC90936		JC94178		JC94178		JC94844		JC94844		JD349	
Sample Date		6/28/2019		6/28/2019		8/29/2019		8/29/2019		9/11/2019		9/11/2019		12/13/2019	
Sample Type Code		WC		WC		WC		WC		WC		WC		WC	
Chemical Name	Unit														
Sulfide Reactive	mg/kg	120	U	120	U	-		-		-		-		130	U
Corrosivity	ph units	0	U	0	U	-		-		-		-		0	U
Pesticides															
Chlordane (Technical)	mg/l	-		-		-		-		-		-		0.0033	U
Endrin	mg/l	0.000067	U	0.000067	U	-		-		-		-		0.000067	U
Gamma Bhc (Lindane)	mg/l	0.000067	U	0.000067	U	-		-		-		-		0.00013	
Heptachlor	mg/l	0.000067	U	0.000067	U	-		-		-		-		0.000067	U
Heptachlor Epoxide	mg/l	0.000067	U	0.000067	U	-		-		-		-		0.000067	U
Methoxychlor	mg/l	0.00013	U	0.00013	U	-		-		-		-		0.00013	U
Toxaphene	mg/l	0.0017	U	0.0017	U	-		-		-		-		0.0017	U
Herbicides															
2,4-D (Dichlorophenoxyacetic Acid)	mg/l	0.0042	U	0.0042	U	-		-		-		-		0.0042	U
Silvex (2,4,5-TP)	mg/l	0.0012	U	0.0012	U	-		-		-		-		0.0012	U

- = Parameter not sampled for
TCLP = Toxicity Characteristic Leaching Procedure
RCRA = Resource Conservation and Recovery Act
mg/l = milligrams per liter
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram

Table 3B
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building SVE System
Liquid Waste Analytical Results

	Sample ID	PINEAVE-010-01		PINEAVE-010-02	
	Matrix	IDW		IDW	
	SDG	JC90936		JC90936	
	Sample Date	6/28/2019		6/28/2019	
	Sample Type Code	WC		WC	
Chemical Name	Unit				
VOCs					
1,1,1-Trichloroethane (TCA)	ug/l	250	U	50	U
1,1,2,2-Tetrachloroethane	ug/l	250	U	50	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1300	U	250	U
1,1,2-Trichloroethane	ug/l	250	U	50	U
1,1-Dichloroethane	ug/l	250	U	50	U
1,1-Dichloroethene	ug/l	250	U	50	U
1,2-Dibromo-3-Chloropropane	ug/l	500	U	100	U
1,2-Dibromoethane (Ethylene Dibromide)	ug/l	250	U	50	U
1,2-Dichlorobenzene	ug/l	250	U	50	U
1,2-Dichloroethane	ug/l	250	U	50	U
1,2-Dichloropropane	ug/l	250	U	50	U
1,3-Dichlorobenzene	ug/l	250	U	50	U
1,4-Dichlorobenzene	ug/l	250	U	50	U
2-Hexanone	ug/l	1300	U	250	U
Acetone	ug/l	2500	U	500	U
Benzene	ug/l	130	U	25	U
Bromochloromethane	ug/l	250	U	50	U
Bromodichloromethane	ug/l	250	U	50	U
Bromoform	ug/l	250	U	50	U
Bromomethane	ug/l	500	U	100	U
Carbon Disulfide	ug/l	500	U	100	U
Carbon Tetrachloride	ug/l	250	U	50	U
Chlorobenzene	ug/l	250	U	50	U
Chloroethane	ug/l	250	U	50	U
Chloroform	ug/l	250	U	50	U
Chloromethane	ug/l	250	U	50	U
Cis-1,2-Dichloroethylene	ug/l	3020		1600	
Cis-1,3-Dichloropropene	ug/l	250	U	50	U
Cyclohexane	ug/l	1300	U	250	U
Dibromochloromethane	ug/l	250	U	50	U
Dichlorodifluoromethane	ug/l	500	U	100	U
Ethylbenzene	ug/l	250	U	50	U
Isopropylbenzene (Cumene)	ug/l	250	U	50	U
M,P-Xylene (Sum Of Isomers)	ug/l	250	U	50	U
Methyl Acetate	ug/l	1300	U	250	U
Methyl Ethyl Ketone (2-Butanone)	ug/l	2500	U	500	U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ug/l	1300	U	250	U
Methylcyclohexane	ug/l	1300	U	250	U
Methylene Chloride	ug/l	500	U	100	U
O-Xylene (1,2-Dimethylbenzene)	ug/l	250	U	50	U
Styrene	ug/l	250	U	50	U
Tert-Butyl Methyl Ether	ug/l	250	U	50	U
Tetrachloroethylene (PCE)	ug/l	187000		27300	
Toluene	ug/l	250	U	50	U
Trans-1,2-Dichloroethene	ug/l	250	U	50	U
Trans-1,3-Dichloropropene	ug/l	250	U	50	U
Trichloroethylene (TCE)	ug/l	9430		3720	
Trichlorofluoromethane	ug/l	500	U	100	U
Vinyl Chloride	ug/l	250	U	50	U
Xylenes	ug/l	250	U	50	U
SVOCs					
1,2,3-Trichlorobenzene	ug/l	250	U	50	U
1,2,4,5-Tetrachlorobenzene	ug/l	2	U	1.9	U
1,2,4-Trichlorobenzene	ug/l	250	U	50	U
1,4-Dioxane (P-Dioxane)	ug/l	0.98	U	0.96	U
2,3,4,6-Tetrachlorophenol	ug/l	4.9	U	4.8	U
2,4,5-Trichlorophenol	ug/l	4.9	U	4.8	U
2,4,6-Trichlorophenol	ug/l	4.9	U	4.8	U
2,4-Dichlorophenol	ug/l	2	U	1.9	U
2,4-Dimethylphenol	ug/l	4.9	U	4.8	U
2,4-Dinitrophenol	ug/l	4.9	U	4.8	U
2,4-Dinitrotoluene	ug/l	0.98	U	0.96	U
2,6-Dinitrotoluene	ug/l	0.98	U	0.96	U
2-Chloronaphthalene	ug/l	2	U	1.9	U
2-Chlorophenol	ug/l	4.9	U	4.8	U
2-Methylnaphthalene	ug/l	0.63	J	0.23	J
2-Methylphenol (O-Cresol)	ug/l	2	U	1.9	U
2-Nitroaniline	ug/l	4.9	U	4.8	U
2-Nitrophenol	ug/l	4.9	U	4.8	U
3,3'-Dichlorobenzidine	ug/l	2	U	1.9	U
3-Nitroaniline	ug/l	4.9	U	4.8	U
4,6-Dinitro-2-Methylphenol	ug/l	4.9	U	4.8	U
4-Bromophenyl Phenyl Ether	ug/l	2	U	1.9	U
4-Chloro-3-Methylphenol	ug/l	4.9	U	4.8	U

Table 3B
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building SVE System
Liquid Waste Analytical Results

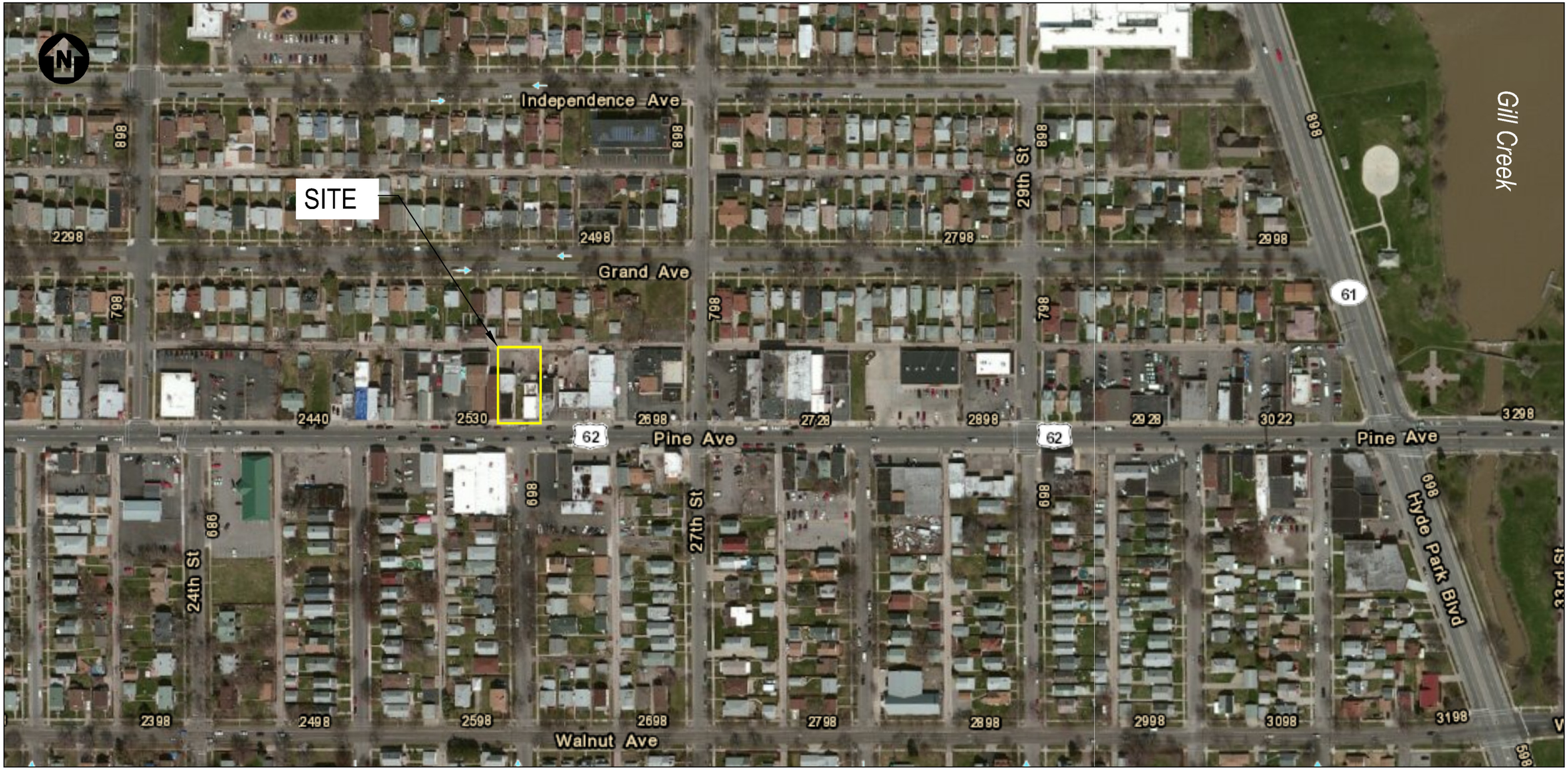
Sample ID		PINEAVE-010-01		PINEAVE-010-02	
Matrix		IDW		IDW	
SDG		JC90936		JC90936	
Sample Date		6/28/2019		6/28/2019	
Sample Type Code		WC		WC	
Chemical Name	Unit				
4-Chloroaniline	ug/l	4.9	U	4.8	U
4-Chlorophenyl Phenyl Ether	ug/l	2	U	1.9	U
4-Methylphenol (P-Cresol)	ug/l				
4-Nitroaniline	ug/l	4.9	U	4.8	U
4-Nitrophenol	ug/l	9.8	U	9.6	U
Acenaphthene	ug/l	0.98	U	0.96	U
Acenaphthylene	ug/l	0.15	J	0.96	U
Acetophenone	ug/l	2	U	1.9	U
Anthracene	ug/l	0.41	J	0.96	U
Atrazine	ug/l	1.4	J	2.4	
Benzaldehyde	ug/l	4.9	U	4.8	U
Benzo(A)Anthracene	ug/l	0.49	J	0.96	U
Benzo(A)Pyrene	ug/l	0.31	J	0.96	U
Benzo(B)Fluoranthene	ug/l	0.35	J	0.96	U
Benzo(G,H,I)Perylene	ug/l	0.98	U	0.96	U
Benzo(K)Fluoranthene	ug/l	0.98	U	0.96	U
Benzyl Butyl Phthalate	ug/l	8.8		10.5	
Biphenyl (Diphenyl)	ug/l	0.23	J	0.96	U
Bis(2-Chloroethoxy) Methane	ug/l	2	U	1.9	U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ug/l	2	U	1.9	U
Bis(2-Chloroisopropyl) Ether	ug/l	2	U	1.9	U
Bis(2-Ethylhexyl) Phthalate	ug/l	5.6		1.9	U
Caprolactam	ug/l	2	U	1.9	U
Carbazole	ug/l	1.1		0.46	J
Chrysene	ug/l	0.39	J	0.96	U
Cresols, M & P	ug/l	2	U	1.9	U
Dibenz(A,H)Anthracene	ug/l	0.98	U	0.96	U
Dibenzofuran	ug/l	0.38	J	0.21	J
Diethyl Phthalate	ug/l	2	U	1.9	U
Dimethyl Phthalate	ug/l	2	U	1.9	U
Di-N-Butyl Phthalate	ug/l	6.4		6.5	
Di-N-Octylphthalate	ug/l	2	U	1.9	U
Dinoseb	ug/l	0.42	U	0.42	U
Fluoranthene	ug/l	1.4		0.19	J
Fluorene	ug/l	0.68	J	0.45	J
Hexachlorobenzene	ug/l	0.98	U	0.96	U
Hexachlorobutadiene	ug/l	0.98	U	0.96	U
Hexachlorocyclopentadiene	ug/l	9.8	U	9.6	U
Hexachloroethane	ug/l	2	U	1.9	U
Indeno(1,2,3-C,D)Pyrene	ug/l	0.98	U	0.96	U
Isophorone	ug/l	2	U	1.9	U
Naphthalene	ug/l	3.4		0.91	J
Nitrobenzene	ug/l	2	U	1.9	U
N-Nitrosodi-N-Propylamine	ug/l	2	U	1.9	U
N-Nitrosodiphenylamine	ug/l	4.9	U	4.8	U
Pentachlorophenol	ug/l	0.042	U	0.068	
Phenanthrene	ug/l	2.3		1.4	
Phenol	ug/l	0.52	J	0.53	J
Pyrene	ug/l	1		0.96	U
Metals					
Aluminum	mg/l	11.4		41.1	
Antimony	mg/l	0.006	U	0.006	U
Arsenic	mg/l	0.0092		0.0218	
Barium	mg/l	0.0771	J	0.242	
Beryllium	mg/l	0.001	U	0.0016	
Cadmium	mg/l	0.003	U	0.003	U
Calcium	mg/l	106		182	
Chromium, Total	mg/l	0.0141		0.0556	
Cobalt	mg/l	0.0096	J	0.0536	
Copper	mg/l	0.0154		0.0591	
Cyanide	mg/l	0.01	U	0.01	U
Iron	mg/l	13.4		58.9	
Lead	mg/l	0.024		0.0249	
Magnesium	mg/l	51.6		65.3	
Manganese	mg/l	0.308		1.33	
Mercury	mg/l	0.0002		0.00017	J
Nickel	mg/l	0.0251		0.0779	
Potassium	mg/l	9.1	J	16.4	
Selenium	mg/l	0.01	U	0.01	U
Silver	mg/l	0.01	U	0.0021	J
Sodium	mg/l	28.6		40.8	
Thallium	mg/l	0.01	U	0.0022	J
Vanadium	mg/l	0.0231	J	0.0794	
Zinc	mg/l	0.044		0.215	
PCBs					

Table 3B
Time 1-Hour Cleaners
Construction Completion Report for DiLaura DDS Building SVE System
Liquid Waste Analytical Results

	Sample ID	PINEAVE-010-01		PINEAVE-010-02	
	Matrix	IDW		IDW	
	SDG	JC90936		JC90936	
	Sample Date	6/28/2019		6/28/2019	
	Sample Type Code	WC		WC	
Chemical Name	Unit				
PCB-1016 (Aroclor 1016)	ug/l	0.33	U	0.33	U
PCB-1221 (Aroclor 1221)	ug/l	0.33	U	0.33	U
PCB-1232 (Aroclor 1232)	ug/l	0.33	U	0.33	U
PCB-1242 (Aroclor 1242)	ug/l	0.33	U	0.33	U
PCB-1248 (Aroclor 1248)	ug/l	0.33	U	0.33	U
PCB-1254 (Aroclor 1254)	ug/l	0.33	U	0.33	U
PCB-1260 (Aroclor 1260)	ug/l	0.33	U	0.33	U
PCB-1262 (Aroclor 1262)	ug/l	0.33	U	0.33	U
PCB-1268 (Aroclor 1268)	ug/l	0.33	U	0.33	U
Pesticides					
Aldrin	ug/l	0.0067	U	0.0067	U
Alpha Bhc (Alpha Hexachlorocyclohexane)	ug/l	0.0067	U	0.0067	U
Alpha Endosulfan	ug/l	0.0067	U	0.0067	U
Beta Bhc (Beta Hexachlorocyclohexane)	ug/l	0.0067	U	0.0067	U
Beta Endosulfan	ug/l	0.0067	U	0.0067	U
cis-Chlordane	ug/l	0.0067	U	0.0067	U
Delta BHC (Delta Hexachlorocyclohexane)	ug/l	0.0067	U	0.0067	U
Dieldrin	ug/l	0.0067	U	0.0057	J
Endosulfan Sulfate	ug/l	0.0067	U	0.0067	U
Endrin	ug/l	0.0067	U	0.0067	U
Endrin Aldehyde	ug/l	0.0067	U	0.0067	U
Endrin Ketone	ug/l	0.0067	U	0.0067	U
Gamma Bhc (Lindane)	ug/l	0.0067	U	0.0067	U
Heptachlor	ug/l	0.0067	U	0.0067	U
Heptachlor Epoxide	ug/l	0.0067	U	0.0067	U
Methoxychlor	ug/l	0.013	U	0.013	U
P,P'-DDD	ug/l	0.0081		0.0054	J
P,P'-DDE	ug/l	0.0067	U	0.0067	U
P,P'-DDT	ug/l	0.0067	U	0.0067	U
Toxaphene	ug/l	0.17	U	0.17	U
trans-Chlordane	ug/l	0.0067	U	0.0067	U
Herbicides					
2,4-(Dichlorophenoxy)butyric acid	ug/l	0.42	U	0.42	U
2,4-D (Dichlorophenoxyacetic Acid)	ug/l	0.42	U	0.42	U
Acetic acid, (2,4,5-trichlorophenoxy)-	ug/l	0.083	U	0.083	U
Dalapon	ug/l	0.083	U	0.083	U
Dicamba	ug/l	0.083	U	0.083	U
Dichloroprop	ug/l	0.42	U	0.42	U
MCPA	ug/l	42	U	42	U
Mecoprop	ug/l	42	U	42	U
Silvex (2,4,5-TP)	ug/l	0.083	U	0.083	U
RCRA/Other					
Ignitability	deg f	200	U	200	U
Reactivity	mg/l	10	U	10	U
Sulfide Reactive	mg/l	100	U	100	U
Corrosivity	ph units	0	U	0	U

RCRA = Resource Conservation and Recovery Act
mg/l = milligrams per liter
ug/l = micrograms per liter
UJ = Estimated and not detected to the reporting limit.
J = estimated at the value given
U = not detected

FIGURES



200 100 0 200 400

SCALE: 1"=200'

FIGURE 1

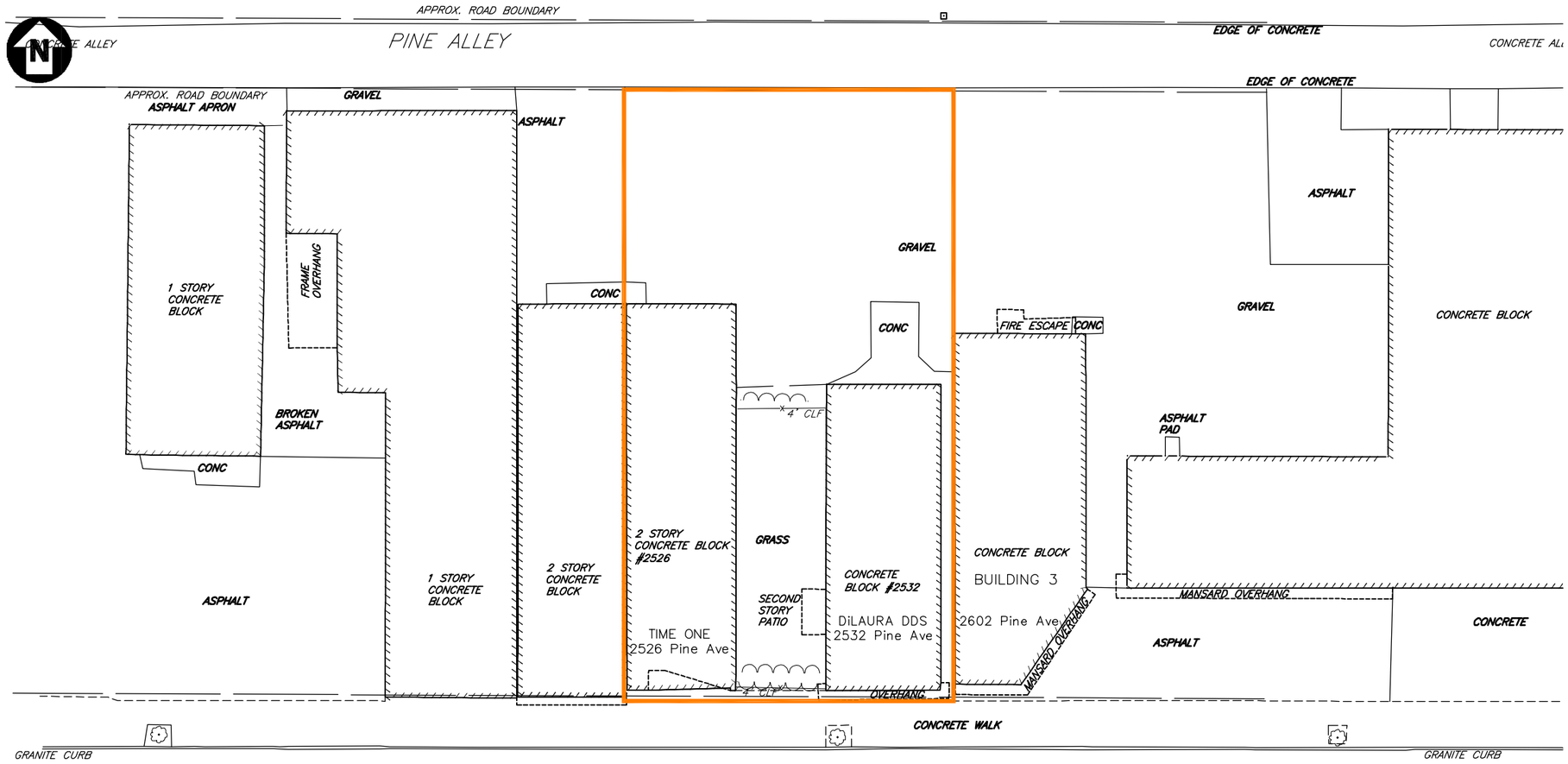
NEW YORK STATE Department of Environmental Conservation

TIME 1-HOUR CLEANERS

SITE LOCATION MAP

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 • 315-451-9560

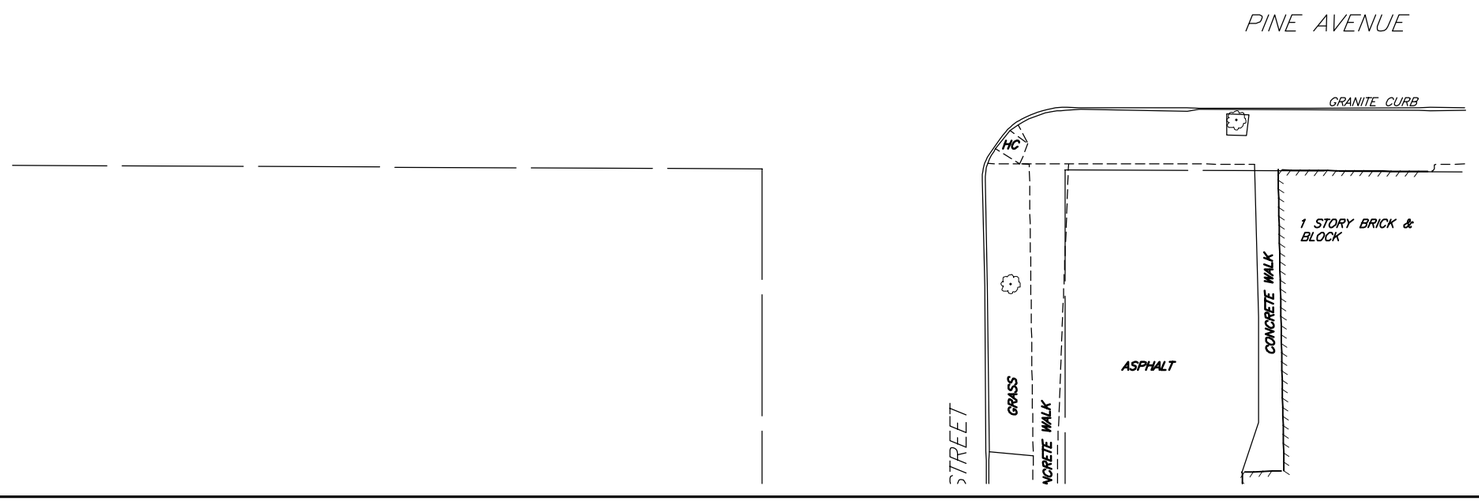
FILE NAME: P:\NYSDEC PROGRAM\448433 WA #13 - PINE AVENUE\10.0 TECHNICAL CATEGORIES\CAD\RI REPORT\448433-RI-001.DWG
PLOT DATE: 10/29/2024 10:10 AM PLOTTED BY: RUSSO, JILL [US-US]



Site Boundary

SURVEY NOTES:

1. BASE MAP ISSUED MAY, 2014 AND UPDATED JULY, 2014 FROM FISHER ASSOCIATES, DRAWING FA–1.
2. COORDINATES AND NORTH ORIENTATION SHOWN HEREON ARE REFERENCED TO THE NEW YORK STATE PLANE COORDINATE SYSTEM, WEST ZONE, TRANSVERSE MERCATOR PROJECTION, NAD 83 (2011) EPOCH 2010.00 USING GPS PROCEDURES AND THE NEW YORK STATE DOT CORS NETWORK.
3. ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 USING GPS PROCEDURES.
4. UNDERGROUND UTILITIES SHOWN HEREON WERE PLOTTED FROM FIELD LOCATIONS, VISIBLE AT THE TIME OF SURVEY, AND UTILITY COMPANY RECORD DRAWINGS. THE LOCATIONS OF ALL UNDERGROUND UTILITIES SHOULD BE STAKED BY THE RESPECTIVE UTILITY COMPANY PRIOR TO ANY CONSTRUCTION.
5. RIGHT OF WAY AND PROPERTY LINES SHOWN HEREON WERE PLOTTED FROM TAX MAP RECORDS AND SHOULD BE CONSIDERED APPROXIMATE.



30 15 0 30 60

SCALE: 1"=30'

FIGURE 2

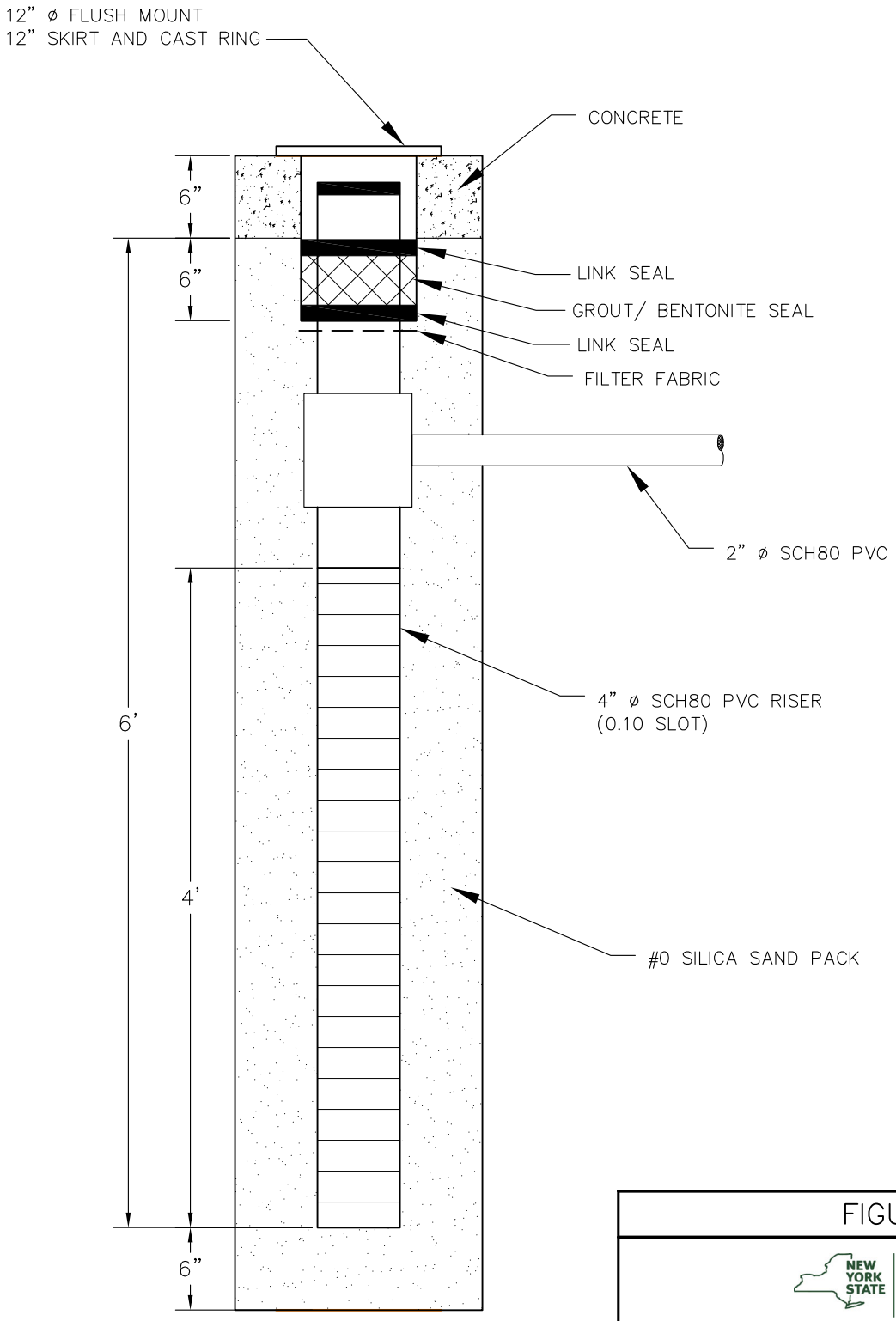
NEW YORK STATE Department of Environmental Conservation

TIME 1–HOUR CLEANERS

SITE PLAN AND VICINITY

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 • 315–451–9560

FILE NAME: P:\NYSDEC PROGRAM\448433 WA #13 – PINE AVENUE\10.0 TECHNICAL CATEGORIES\CAD\RI REPORT\448433–RI–002.DWG
PLOT DATE: 8/22/2024 10:08 AM PLOTTED BY: RUSSO, JILL [US–US]



NOT TO SCALE

FIGURE 3

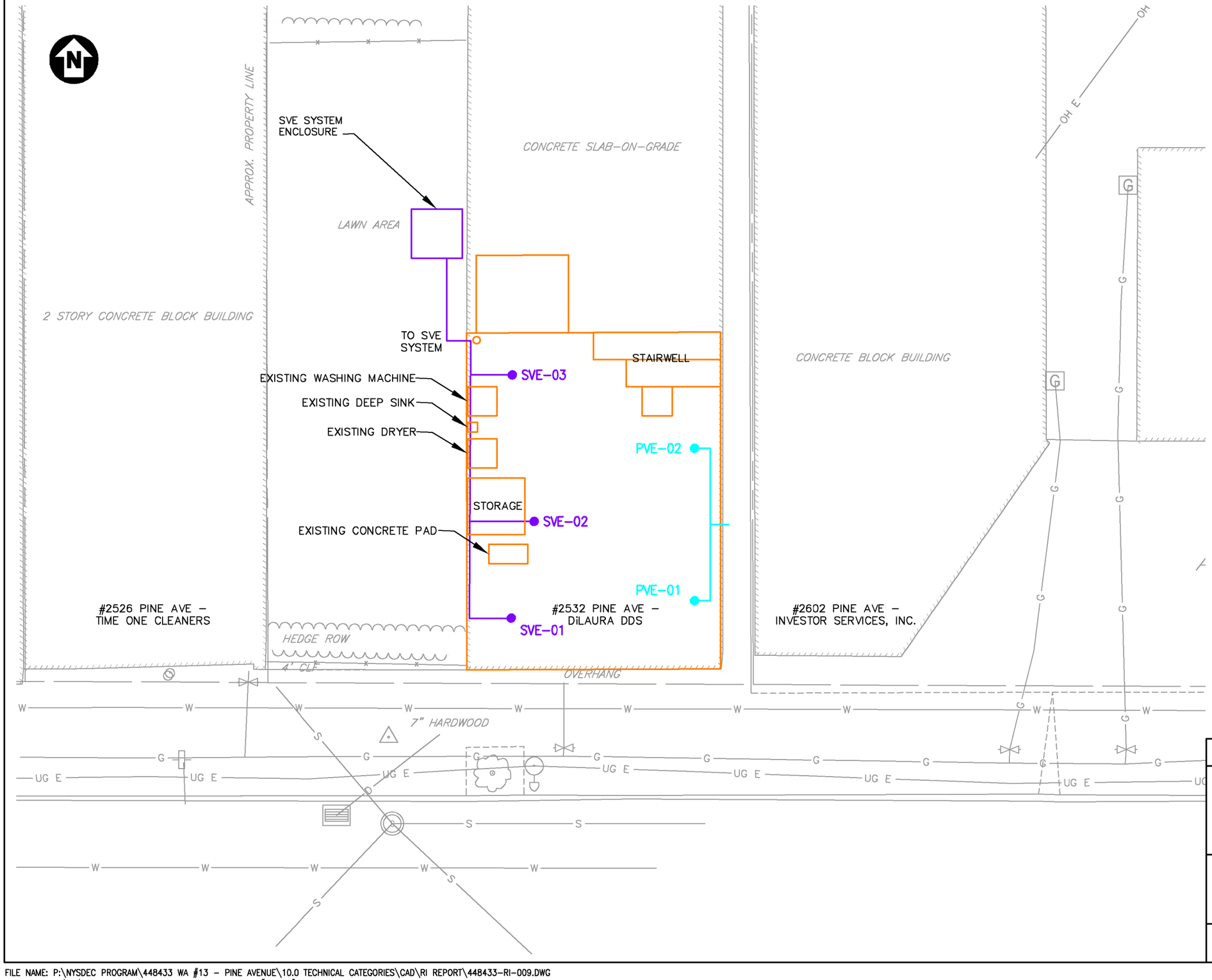
NEW YORK STATE Department of Environmental Conservation

2532 PINE AVE

SVE WELL SCHEMATIC

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 * 315-451-9560

FILE NAME: P:\NYSDEC PROGRAM\448433 WA #13 - PINE AVENUE\10.0 TECHNICAL CATEGORIES\CAD\448433-SK-SVE-1.DWG
PLOT DATE: 10/29/2024 10:26 AM PLOTTED BY: RUSSO, JILL [US-US]



LEGEND:

- SVE LINE
- SVE WELL
- PASSIVE INJECTION PIPING
- PASSIVE INJECTION WELL
- BASEMENT FOOTPRINT

NOTES:

1. SVE WELL RADIUS–OF–INFLUENCE TO BE VERIFIED FOLLOWING SYSTEM INSTALLATION.
2. FRESH AIR INJECTION WELLS WERE CONSTRUCTED IN THE SAME MANNER AS THE SVE WELLS, TO ALLOW FOR POTENTIAL FUTURE INCORPORATION INTO SVE SYSTEM.
3. SVE LINE RUNS BELOW BASEMENT SLAB UNTIL IT ENCOUNTERS THE WALL, AT WHICH POINT IT WILL 90° TO THE HEADER PIPE.
4. ALL FLOW CONTROLS, MONITORING PORTS, AND VALVES LOCATED ON THE ABOVE–SLAB VERTICAL PIPING RUNS.

10 5 0 10 20

SCALE: 1"=10'

FIGURE 4

NEW YORK STATE Department of Environmental Conservation

TIME 1–HOUR CLEANERS

SOIL VAPOR EXTRACTION (SVE) SYSTEM LAYOUT FOR 2532 PINE AVENUE

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FILE NAME: P:\NYSDEC PROGRAM\448433 WA #13 – PINE AVENUE\10.0 TECHNICAL CATEGORIES\CAD\RI REPORT\448433–RI–009.DWG
PLOT DATE: 1/29/2025 2:46 PM PLOTTED BY: RUSSO, JILL [US–US]

APPENDIX A PROPOSED REMEDIAL ACTIONS FOR PINE AVENUE RI/FS AND SUPPLEMENTAL RI MEMORANDUM

PARSONS

301 Plainfield Road, Suite 350 / Syracuse, New York 13212
P: 315.451.9560 / F: 315.451.9570 / www.parsons.com

MEMORANDUM

September 13, 2018

To: Heidi-Marie Dudek, P.E., NYS Department of Environmental Conservation

From: Parsons

Subject: Proposed Remedial Actions for WA D007623-13 Pine Avenue RI/FS and Supplemental RI (Site #932158)

Introduction

Following a discussion between NYSDEC, NYSDOH and Parsons representatives on July 26, 2018, Parsons was requested to develop a short-term interim remedial measure (IRM), a long-term remedy, and a contingent remedy to supplement the long-term remedial approach, if required, to address contamination present at the Pine Avenue Site in Niagara Falls, NY. The remedial options developed for the site are summarized below:

1. Short-term IRM: Seal basement floor slab/basement walls, lining of the sub-slab sanitary sewer utility in basement, including associated floor drains, and sealing of utility penetrations between the basement and 1st floor of the structure.

2. Long-Term Remedial Action: In addition to the measures implemented under the short -term IRM, the long-term remedy includes the installation of a three-well soil vapor extraction (SVE) system beneath the basement floor. The SVE system will also include the installation of two fresh-air injection points through the basement floor.

3. Contingent Remedial Action: If deemed necessary based on the performance of the SVE system, the system may be expanded to address a larger area. The expansion would include conversion of the fresh-air intake wells noted above into soil vapor extraction wells and installation of additional extraction wells outside of the footprint of the DiLaura building, providing greater coverage throughout the subsurface.

Background

The Pine Ave Supplemental RI scope of work included the installation of 3 bedrock monitoring wells, 2 soil borings, and 5 soil vapor points to further delineate impacts to soils and air samples observed during the 2014 Phase I Remedial Investigation. Soils from the borings and monitoring wells were analyzed in the field with a PID, classified via Burmister and USCS, and select intervals were submitted for laboratory analysis. The newly installed monitoring wells were developed, sampled using low-flow methods, and submitted to the laboratory for analysis. The newly installed soil vapor points were sampled using individually certified SUMMA® canisters and submitted for analysis in accordance with pertinent NYSDOH guidance documents.

Results Summary

Analytical data from indoor air, ambient air, soil vapor, and sub-slab vapor samples collected from March 2014 through July 2018 have consistently indicated concentrations of PCE, TCE, and 1,2-DCE in exceedance of the guidance values outlined in the 2006 NYSDOH "Guidance for Evaluating Soil Vapor Intrusion in New York State" document, and subsequent updates.

Analytical data from soil samples collected in April 2014 and June-July 2018 indicate concentrations of PCE, TCE, and 1,2-DCE in exceedance of the 6 NYCRR Part 375 Unrestricted Use SCOs in soils submitted from MW-02 and SB-11. Elevated concentrations of PCE were also detected above 6 NYCRR Part 375 Unrestricted Use SCOs in soils submitted from SS-01, SS-02, SS-03, SB-10, and MW-07. Elevated concentrations of vinyl chloride in exceedance of 6 NYCRR Part 375 Unrestricted Use SCOs were detected in soils submitted from MW-04.

Analytical data from groundwater samples collected in July 2018, and a surface water sample collected from the DiLaura DDS sump in September 2015 indicates elevated concentrations of 1,2-DCE, and vinyl chloride in exceedance of the NYSDEC Class GA Groundwater Standards in all newly installed monitoring wells (MW-07, MW-08, MW-09) as well as groundwater collected from the basement boring (SB-11). Elevated concentrations of PCE and TCE in exceedance of NYSDEC Class GA Groundwater Standards were also detected in MW-08, MW-09, and SB-11, and the DiLaura sump.

Conclusions

Indoor air contaminant impacts necessitated the installation of sub-slab depressurization systems in the Time One Cleaners and Investor Services properties, and the installation of seven air purifying units (APUs) in the DiLaura DDS building.

Persistent indoor air impacts of PCE, TCE following APU installation prompted further investigation into the basement, and the development of additional remedial actions.

Based on validated data from the 2014-2016 sampling events and preliminary results from the 2018 sampling events it appears likely that improper storage, use, and/or disposal of dry cleaning solvents historically used by Time One Cleaners during their operation in the present-day DiLaura DDS building may have impacted the sub-slab soils. As evidenced by elevated concentrations of PCE, TCE, 1,2-DCE, and vinyl chloride in the SB-11 groundwater and soil samples, in the vicinity of the sanitary sewer utility, it is suspected that the contamination of sub-slab soils was the result of the discharge of incidental spills of dry cleaning solvents to the sanitary sewer and associated pipe bedding material via three basement floor drains.

Recommendations

The elevated concentration of contaminants in the basement soil boring indicates close proximity to a potential source area beneath the building. The presence of this source area has resulted in negative impacts to indoor air quality throughout the DiLaura DDS building. In order to mitigate the soil vapor impacts, Parsons recommends implementing the short-term IRM and long-term remedial action summarized above. The remedial actions should include the following:

Short-Term IRM

1. Continued operation of seven air purifying units (APUs) until the long-term remedial action has been completed;

2. Sealing of the basement slab and walls. This will include application of elastomeric caulk to seal cracks, cold joints, or penetrations of the concrete surfaces and application of an epoxy concrete sealer over the floor and wall surfaces.

3. Lining of the sub-slab portion of the sanitary sewer utility, including three floor drain connections utilizing a cured in-place pipe (CIPP) or pull in place (PIP) system to isolate the piping from contaminated soil beneath the building.

4. Sealing of utility (or other) penetrations and/or chases through the basement ceiling to minimize communication of air from the basement with working/living spaces of the building on the first and second stories. This will include application of elastomeric caulk or expandable foam insulation at penetration locations and sealing of HVAC ducts with mastic duct sealant or metal duct tape.

Long-Term Remedial Action

1. Installation of an SVE system consisting of three extraction wells, and two fresh air injection points (see attached sketch).

    a. Extraction wells will be installed to a depth of approximately 6 feet below the basement slab and screened across the entire interval beneath the slab. Wells will be located on the western side of the building adjacent to the sanitary sewer utility. Well will be flush-mounted with the basement floor and extraction piping will be routed along the western wall of the basement to minimize impacts to the usable space of the basement. Fresh air injection points will be installed along the eastern side of the building to a depth of approximately 6 feet below the slab. The injection points will be flush mounted and associated piping will be routed along the eastern wall of the building. During SVE well installation, soils will be logged, screened with a PID, and up to two soil samples may be submitted to a laboratory for chemical analysis. Soil samples will be selected on the basis of highest PID reading and/or taken from a discrete depth within the sanitary sewer pipe bedding.

    b. The SVE system will consist of a ½ horsepower regenerative blower, condensate removal tank, vapor-phase carbon for treatment of off gas, associated piping and mechanical components (e.g. gauges, valves, etc.), electrical supply and control system, remote monitoring system (e.g. wireless auto-dialer system), and weather-proof system enclosure. It is proposed that the SVE system enclosure be located at the northwestern corner of the building in the lawn area, actual location will be selected in consultation with the property owner.

Engineers Cost Estimate

Parsons has prepared an engineer's cost estimate for implementation of the recommended remedial actions presented above. A summary of the estimate is provided below:

ITEM	Estimated Total
Short-term IRM	$43,130.00
SVE System Design	$13,800.00
SVE Well Installation	$31,413.00
SVE System Installation	$50,534.00
System Operation, Maintenance, & Monitoring	$33,018.00

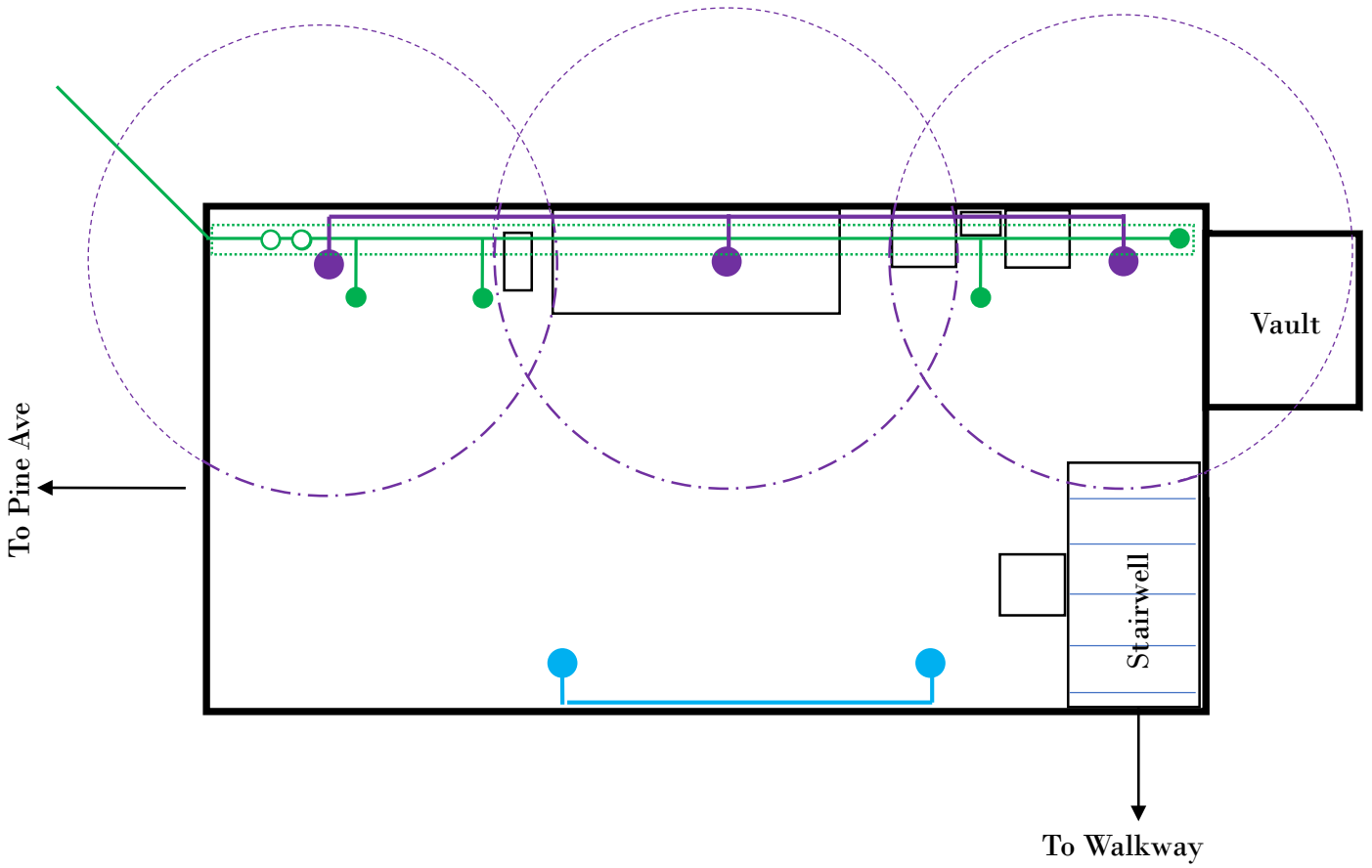
*Note: OM&M costs are assumed to cover weekly visits for the first month following system installation, and monthly visits thereafter. Following the first year, O&M has been estimated at a rate of approximately $2,000.00/month.

The estimated cost for the scope-of-work work described above is **$171,895.00.**

cc: Sara Weishaupt, Parsons
Michael Broschart, Parsons
Tom Drachenberg, Parsons

Legend:

- Storm/Sewer line
- PVC Plug/Vent
- Floor Drain
- Utility Corridor – Pipe Bedding
- SVE Line
- SVE Well
- Fresh Air Intake Line
- Fresh Air Well



Notes:

1. SVE Well ROI not measured, will be determined during system installation.
2. Sanitary Sewer pipe conduit is estimated to be approximately 18", based on 4" pipe diameter.
3. Fresh air injection wells will be constructed in the same manner as the SVE wells, to allow for potential future incorporation into SVE system.
4. SVE line will run below basement slab until it encounters the wall, at which point it will 90° to the header pipe.
5. All requisite flow controls and OM&M ports and valves will be located on the above slab vertical runs.

Proposed SVE System Layout
for the DiLaura DDS Building

NYSDEC WA D007623-13
Pine Avenue Site

Scale: NTS | Drawn: 08/31/18

PARSONS

DRAFT – For Internal Purposes Only

APPENDIX B SOIL VAPOR EXTRACTION SYSTEM DESIGN MEMORANDUM

PARSONS

301 Plainfield Road, Suite 350 / Syracuse, New York 13212
P: 315.451.9560 / F: 315.451.9570 / www.parsons.com

MEMORANDUM

December 27, 2018

To: Heidi Dudek, P.E.; New York State Department of Environmental Remediation

From: Sara Weishaupt; Parsons

Subject: Soil Vapor Extraction System Design Memo

Heidi,

This is a memo detailing the Soil Vapor Extraction (SVE) System proposed for the DiLaura DDS building.

The SVE system consists of five wells: three soil vapor extraction (SVE) wells and two fresh air intake wells. Each well will be advanced to a depth of six feet below slab and will be constructed using 4-inch diameter SCH80 PVC riser and .010-slot screen. The annular space will be filled with a size "0" sand pack. Each well will be constructed to include a lateral run of 2" SCH80 PVC, which will be run to a 1.25-inch galvanized header pipe (SVE wells) or an exterior vent cap (passive injection wells). The wellhead will be to prevent communication between indoor air and the subsurface environment.

The header pipe joining the three SVE wells will exit the building the building above grade and will join with the system enclosure via flex joint.

The system enclosure is a 7-ft long by 8-ft wide by 8.5-ft tall insulated and sound attenuated steel container containing a premanufactured SVE system. The system consists of:

- A 2 horsepower (hp) regenerative blower equipped with a silencer and designed to handle a flow rate of up to 30 cubic feet per minute per well, and a maximum vacuum of 20-inches water column.
- Moisture separator with level switch
- A drum-style vapor phase granular activated carbon off-gas treatment system.

The system will include an instrumentation and control package of system vacuum, pressure, and temperature gauges as well as high-level (moisture separator), high-temperature (blower), and low-vacuum (blower) shutoff switches.

A remote telemetry system will be in place to communicate system status and transmit any alarms that may occur, including system low vacuum, moisture separator high level, high temperature, blower motor fault, and system shutdown (manual from local switch).

---

cc: Thomas Drachenberg, Michael Broschart, and Peter Scharfschwerdt (Parsons)
Steven Karpinski (NYSDOH)

Draft for Discussion Purposes Only

Enc: Pine Avenue SVE System Figures

APPENDIX C SVE SYSTEM MANUAL

Operation & Maintenance Manual

NES PROJECT NUMBER: 19-119, July 2019
PROJECT NAME: SVE System – 8ft Cargo Box
NYSDEC Site ID #932158
2532 Pine Avenue
Niagara Falls, NY 14301

Prepared for:

Parsons
301 Plainfield Road Suite 350
Syracuse, NY 13212

Sales: (508)226-1100 Option 2
Technical Support: (508)226-1100 Option 3

Phone (508) 226-1100 Fax (508) 226-1180 84 Dunham Street Attleboro, MA 02703
www.nes-inc.com

OPERATION & MAINTENANCE MANUAL

NES 19-119 - PARSONS - NYSDEC SITE ID #932158 / SVE- PINE AVE - NIAGARA FALLS, NY

SECTION 1 - SUMMARY OF EQUIPMENT

COMPONENT SUMMARY

WARRANTY STATEMENT

SECTION 2 - MECHANICAL DRAWINGS & TABLE(S)

M-1, PROCESS & INSTRUMENTATION DIAGRAM (P&ID)

T-1, INSTRUMENTATION TABLE

M-2, ENCLOSURE LAYOUT DRAWING, PLAN VIEW

M-3, MOISTURE SEPARATOR (MS) DRAWING

SECTION 3 - CARGO BOX ENCLOSURE ACCESSORIES

ELECTRIC HEATER w/ THERMOSTAT, 1.8 kW, 240 VAC, 1-PHASE, 8.3 AMP - DAYTON 2HAC7

VENT FAN, 12 IN, 1640 CFM @ 0 IN S.P., 115 VAC, 1.8 AMPS - CANARM AX12-2

VENT FAN THERMOSTAT, 30-110 F ADJUSTABLE - DAYTON 6EDY5

FLUORESCENT VAPOR TIGHT LIGHT FIXTURE - LITHONIA MNSL L48 2LL MVOLT GZN 40K 80CRI

SOUND REDUCTION INSULATION, 1 INCH - AMERICAN ACOUSTICAL HC1.00EBUA3-ANATIO

SECTION 4 - PROCESS EQUIPMENT

SVE REGENERATIVE BLOWER: MAX FLOW 53 ACFM / MAX VACUUM 40" W.C(V) - GAST R3105-1

MOISTURE SEPARATOR (MS), 16 GALLONS, 2 IN INLET - NES 16 GAL

VACUUM RELIEF VALVE, 1-1/2 IN FNPT, ADJ, SET AT 40 IWC - KUNKLE 215V-H01AQEOOO2

INLINE FILTER, 2 IN, L-STYLE - SOLBERG CSL-851-200HC

DILUTION FILTER SILENCER, 1.5 IN - SOLBERG FS-19P-150

VAPOR PHASE CARBON VESSELS, 200 LB - CFS VS200

SECTION 5 - PROCESS INSTRUMENTATION

VACUUM INDICATORS, [-]60 TO 0 IWC(V) - DWYER LPG4-D7522N

MOISTURE SEPARATOR EMERGENCY HIGH LEVEL SWITCH - MADISON M8700

SVE BLOWER LOW VACUUM SWITCH, 4-20 IN W.C. SET AT 4 IWC(V) - DWYER 1950-20-2F

TEMPERATURE INDICATORS, 0 TO 250 F - AV 1NFY4

PRESSURE INDICATOR, 0-25 IWC - DWYER LPG4-D8222N

BLOWER DISCHARGE HIGH TEMPERATURE SWITCH SET AT 150 F - UNITED ELECTRIC B54-103

SECTION 6 - ELECTRICAL DRAWINGS & TABLE(S)

SENSAPHONE SENTINEL TELEMETRY INFORMATION

T-2, INTERLOCK TABLE

I-1, CONTROL PANEL LAYOUT DRAWING

T-3, ELECTRICAL PANEL BOM

I-1, CONTROL PANEL WIRING DIAGRAM(S)

T-4, NEC LOAD LIST

E-1, LINE DIAGRAM

E-2, POWER DISTRIBUTION PANEL LAYOUT

SECTION 7 -POWER DISTRIBUTION COMPONENTS

DIST. PANEL 125 AMP RATING, SINGLE PHASE, NEMA 3R 12 SLOT - SQUARE D QO112L125GRB

SECTION 8 - CONTROL PANEL COMPONENTS

SENTINEL TELEMETRY SYSTEM - VERIZON - SENSAPHONE SCD-1200-4GVZZ

WIRELESS MODEM 3G / 4G / LTE EXTERNAL ANTENNA - 16 FT CABLE - SENSAPHONE FGD-0261

ENCLOSURE NEMA4 24 X 20 X 8 - MILD STEEL/LIGHT GRAY - SAGINAW SCE-24EL2008LP

PLC, 8 DC IN / 6 RELAY OUT, 24VDC POWER - ADI C0-10DRE-D

8PT 6-240VAC/6-27VDC RELAY OUTPUT 1A 2 ISOLATED COMMONS - ADI C0-08TR

MUSHROOM SWITCH RED TRIGGER ACTION - TURN TO RELEASE - SQUARE D ZB5AS844

SECTION 1 - SUMMARY OF EQUIPMENT

COMPONENT SUMMARY

WARRANTY STATEMENT

Phone (508) 226-1100 Fax (508) 226-1180 84 Dunham Street Attleboro, MA 02703
www.nes-inc.com

National Environmental Systems
84 Dunham Street
Attleboro, MA 02703

NES MAJOR COMPONENT SUMMARY | **REV A** | JULY 2019

PROJECT NO.: **19-119** | **PARSONS - NYSDEC SITE ID #932158 / SVE- PINE AVE - NIAGARA FALLS, NY**

COMPONENT	TAG	QTY	MANUFACTURER	MODEL	SERIAL NUMBER
SECTION 1 - SUMMARY OF EQUIPMENT					
COMPONENT SUMMARY					
WARRANTY STATEMENT					
SECTION 2 - MECHANICAL DRAWINGS & TABLE(S)					
M-1, PROCESS & INSTRUMENTATION DIAGRAM (P&ID)	M-1				
T-1, INSTRUMENTATION TABLE	T-1				
M-2, ENCLOSURE LAYOUT DRAWING, PLAN VIEW	M-2				
M-3, MOISTURE SEPARATOR (MS) DRAWING	M-3				
SECTION 3 - CARGO BOX ENCLOSURE ACCESSORIES					
ELECTRIC HEATER w/ THERMOSTAT, 1.8 kW, 240 VAC, 1-PHASE, 8.3 AMP		1	DAYTON	2HAC7	O419
VENT FAN, 12 IN, 1640 CFM @ 0 IN S.P., 115 VAC, 1.8 AMPS		1	CANARM	AX12-2	O619
VENT FAN THERMOSTAT, 30-110 F ADJUSTABLE		1	DAYTON	6EDY5	N/A
FLUORESCENT VAPOR TIGHT LIGHT FIXTURE		1	LITHONIA	MNSL L48 2LL MVOLT GZN 40K 80CRI	N/A
SOUND REDUCTION INSULATION, 1 INCH		1	AMERICAN ACOUSTICAL	HC1.00EBUA3-ANATIO	N/A
SECTION 4 - PROCESS EQUIPMENT					
SVE REGENERATIVE BLOWER: MAX FLOW 53 ACFM / MAX VACUUM 40" W.C(V)	B-101	1	GAST	R3105-1	0519400450
SVE BLOWER MOTOR, 1/2 HP 230 VAC, SINGLE PHASE, TEFC	B-101	1	NIDEC MOTOR CORPORATION	J411X	EPT0935
MOISTURE SEPARATOR, 16 GALLONS, 2 IN INLET	VLS-101	1	NES	16 GAL	N/A
VACUUM RELIEF VALVE, 1-1/2 IN FNPT, ADJ, SET AT 40 IWC	VRV-101	1	KUNKLE	215V-H01AQEOOO2	
INLINE FILTER, 2 IN, L-STYLE	F-101	1	SOLBERG	CSL-851-200HC	N/A
DILUTION FILTER SILENCER, 1.5 IN	F-102	1	SOLBERG	FS-19P-150	N/A
VAPOR PHASE CARBON VESSELS, 200 LB	VGAC-101	1	CFS	VS200	N/A
VAPOR PHASE 4x10 CARBON MEDIA	VGAC-101	200 LBS	CFS	4 X 10 VIRGIN	N/A
SECTION 5 - PROCESS INSTRUMENTATION					
VACUUM INDICATORS, [-]60 TO 0 IWC(V)	VI-101 / 103	3	DWYER	LPG4-D7522N	N/A
MOISTURE SEPARATOR EMERGENCY HIGH LEVEL SWITCH	LSHH-101	1	MADISON	M8700	N/A
SVE BLOWER LOW VACUUM SWITCH, 4-20 IN W.C. SET AT 4 IWC(V)	VSL-101	1	DWYER	1950-20-2F	A26AE
TEMPERATURE INDICATORS, 0 TO 250 F	TI-101 / 102	2	AV	1NFY4	N/A
PRESSURE INDICATOR, 0-25 IWC	PI-101,102	2	DWYER	LPG4-D8222N	N/A
BLOWER DISCHARGE HIGH TEMPERATURE SWITCH SET AT 150 F	TSH-101	1	UNITED ELECTRIC	B54-103	K2537144
SECTION 6 - ELECTRICAL DRAWINGS & TABLE(S)					
SENSAPHONE SENTINEL TELEMETRY INFORMATION					
T-2, INTERLOCK TABLE	T-2				
I-1, CONTROL PANEL LAYOUT DRAWING	I-1				
T-3, ELECTRICAL PANEL BOM	T-3				
I-1, CONTROL PANEL WIRING DIAGRAM(S)	I-2				
T-4, NEC LOAD LIST	T-4				
E-1, LINE DIAGRAM	E-1				
E-2, POWER DISTRIBUTION PANEL LAYOUT	E-2				
SECTION 7 -POWER DISTRIBUTION COMPONENTS					
DIST. PANEL 125 AMP RATING, SINGLE PHASE, NEMA 3R 12 SLOT	DP	1	SQUARE D	QO112L125GRB	N/A
MAIN CIRCUIT BREAKER, 30A, 2-POLE, 120/240 VAC, 1-PHASE, 10KA	CB	1	SQUARE D	QO230	N/A

National Environmental Systems
84 Dunham Street
Attleboro, MA 02703

NES MAJOR COMPONENT SUMMARY **REV A** JULY 2019

PROJECT NO.: **19-119** **PARSONS - NYSDEC SITE ID #932158 / SVE- PINE AVE - NIAGARA FALLS, NY**

COMPONENT	TAG	QTY	MANUFACTURER	MODEL	SERIAL NUMBER
SVE BLOWER CIRCUIT BREAKER 15A 2P	CB	1	SQUARE D	QO215	N/A
HEATER CIRCUIT BREAKER 15A 2P	CB	1	SQUARE D	QO215	N/A
ACCESSORY CIRCUIT BREAKER(S) 15A 1P	CB	4	SQUARE D	QO115	N/A
LOAD CENTER GROUND BAR 15 TERMINALS	GB	1	SQUARE D	PK15GTA	N/A
SECTION 8 - CONTROL PANEL COMPONENTS					
SENTINEL TELEMETRY SYSTEM - VERIZON	TELEMETRY	1	SENSAPHONE	SCD-1200-4GVZZ	00:07:F9:00:B8:48
WIRELESS MODEM 3G / 4G / LTE EXTERNAL ANTENNA - 16 FT CABLE	TELEMETRY	1	SENSAPHONE	FGD-0261	N/A
ENCLOSURE NEMA4 24 X 20 X 8 - MILD STEEL/LIGHT GRAY	ENCL	1	SAGINAW	SCE-24EL2008LP	UL: B-55402691
BACK-PANEL 24 X 20 MILD STEEL/WHT	ENCL	1	SAGINAW	SCE-24P20	N/A
MOUNTING FEET SET OF 4 - ZINC PLATED	ENCL	1	SAGINAW	SCE-ELMFK4	N/A
PANEL WING-KNOB PAD-LOCKING HANDLE BLACK	ENCL	2	SAGINAW	SCE-PLWKB	N/A
RELAY DPDT 120VAC W/INDICATOR LIGHT	CR	1	IDEC	RH2B-UL-AC120V	N/A
SOCKET DIN RAIL/SURFACE 8-BLADE FOR RH2B	CR	1	IDEC	SH2B-05	N/A
1.3AMP AC SYSTEM POWER SUPPLY NO POWER BUDGET	PLC	1	ADI	C0-01AC	18Y27C113
PLC, 8 DC IN / 6 RELAY OUT, 24VDC POWER	PLC	1	ADI	C0-10DRE-D	192278063
8PT 6-240VAC/6-27VDC RELAY OUTPUT 1A 2 ISOLATED COMMONS	PLC	2	ADI	C0-08TR	192018056
CIRCUIT BREAKER 6A 1-POLE 120/240 VAC 1-PHASE 10KA DIN-MOUNT	CB	1	SQUARE D	MG24430	N/A
MOTOR STARTER CONTACTOR 3PST-NO 120VAC 20A DIN RAIL	M1	1	SQUARE D	LC1D09G7	N/A
MOTOR STARTER OVERLOAD RELAY, 3-PHASE, 2.5 - 4 AMPS	M1	1	SQUARE D	LRD08	N/A
MUSHROOM SWITCH RED TRIGGER ACTION - TURN TO RELEASE	ESTOP	1	SQUARE D	ZB5AS844	N/A
3 POS SELECTOR SWITCH ILLUM. GREEN MOMENTARY	SW	1	SQUARE D	ZB5AK1733	N/A
2 POS SELECTOR SWITCH ILLUM. GREEN MAINTAINED	SW	1	SQUARE D	ZB5AK1233	N/A
MOUNTING BASE120V GREEN PROTECTED LED	LT	2	SQUARE D	ZB5AVG3	N/A
PILOT LIGHT HEAD RED LED	LT	5	SQUARE D	ZB5AV043	N/A
PUSH BUTTON OPERATOR NON-ILLUM BLACK	PB	1	SQUARE D	ZB5AA2	N/A
MOUNTING COLLAR LATCH PB	PB	2	SQUARE D	ZB5AZ009	N/A
MOUNTING BASE 120V RED PROTECTED LED	LT	5	SQUARE D	ZB5AVG4	N/A
CONTACT BLOCK 1-N.O. SCREW CLAMP	SW	5	SQUARE D	ZBE101	N/A
CONTACT BLOCK 1-N.C. SCREW CLAMP	SW	1	SQUARE D	ZBE102	N/A
TERMINAL BLOCK END ANCHORS	TB	2	SQUARE D	NSYTRAABV35	N/A
TERMINAL BLOCK END BARRIERS GRAY	TB	1	SQUARE D	NSYTRAC22	N/A
TERMINAL BLOCK SCREW CLAMP 20 AMP 600 V GRAY	TB	18	SQUARE D	NSYTRV22	N/A
TERMINAL BLOCK GROUND SCREW CLAMP 20 AMP 600 V GREEN	TB	5	SQUARE D	NSYTRV22PE	N/A
LEGEND PLATE HOLDER	PB	8	SQUARE D	ZBZ33-	N/A
BLANK PLATE LARGE BLACK/RED	PB	8	SQUARE D	ZBY5101	N/A
LOAD CENTER GROUND BAR 15 TERMINALS	GB	1	SQUARE D	PK15GTA	N/A

WARRANTY

All products not manufactured by RapidTech LLC d/b/a National Environmental Systems, carry the original manufacturer's warranty. Copies are available on request.

RapidTech LLC d/b/a National Environmental Systems, warrants its packaged and manufactured equipment against any defect in material or workmanship, under normal use and storage for a period of twelve (12) months from date of manufacture and invoice, regardless of system start-up date. In the event that products are found to be defective within the warranty period, RapidTech LLC d/b/a National Environmental Systems, sole obligation and remedy shall be the furnishing of replacements for any defective parts, and such replacement parts shall be furnished but not installed by RapidTech LLC d/b/a National Environmental Systems RAPIDTECH LLC D/B/A NATIONAL ENVIRONMENTAL SYSTEMS, WILL NOT BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES IN ANY CLAIM SUIT OR PROCEEDINGS ARISING UNDER WARRANTY, NOR WILL RAPIDTECH LLC D/B/A NATIONAL ENVIRONMENTAL SYSTEMS, ACCEPT ANY LIABILITY FOR CLAIMS FOR LABOR, LOSS OR PROFIT, REPAIRS OR OTHER EXPENSES INCIDENTAL TO REPLACEMENT.

The warranty requires that the purchaser complete all operations and maintenance as detailed in each section of the Operation & Maintenance Manual supplied with the purchased system. In addition installation must comply with nationally recognized electrical and mechanical standards as well as best engineering practices in effect at the time of purchase.

The product warranty expressed above is our only warranty and may not be verbally changed or modified by any representative of RapidTech LLC d/b/a National Environmental Systems All freight costs incurred in shipping parts to or from RapidTech LLC d/b/a National Environmental Systems, or to the manufacturer if necessary are at the expense of the customer.

RapidTech LLC dba National Environmental Systems, will invoice the cost of any replacement parts. These parts will be credited upon certification the original part was defective and the defective part was returned within one week of notifying RapidTech LLC d/b/a National Environmental Systems, of the malfunction. If the part is found to have been misused no credit will be issued. In order for RapidTech LLC d/b/a National Environmental Systems, to ship a replacement part on account, all outstanding invoices must be current.

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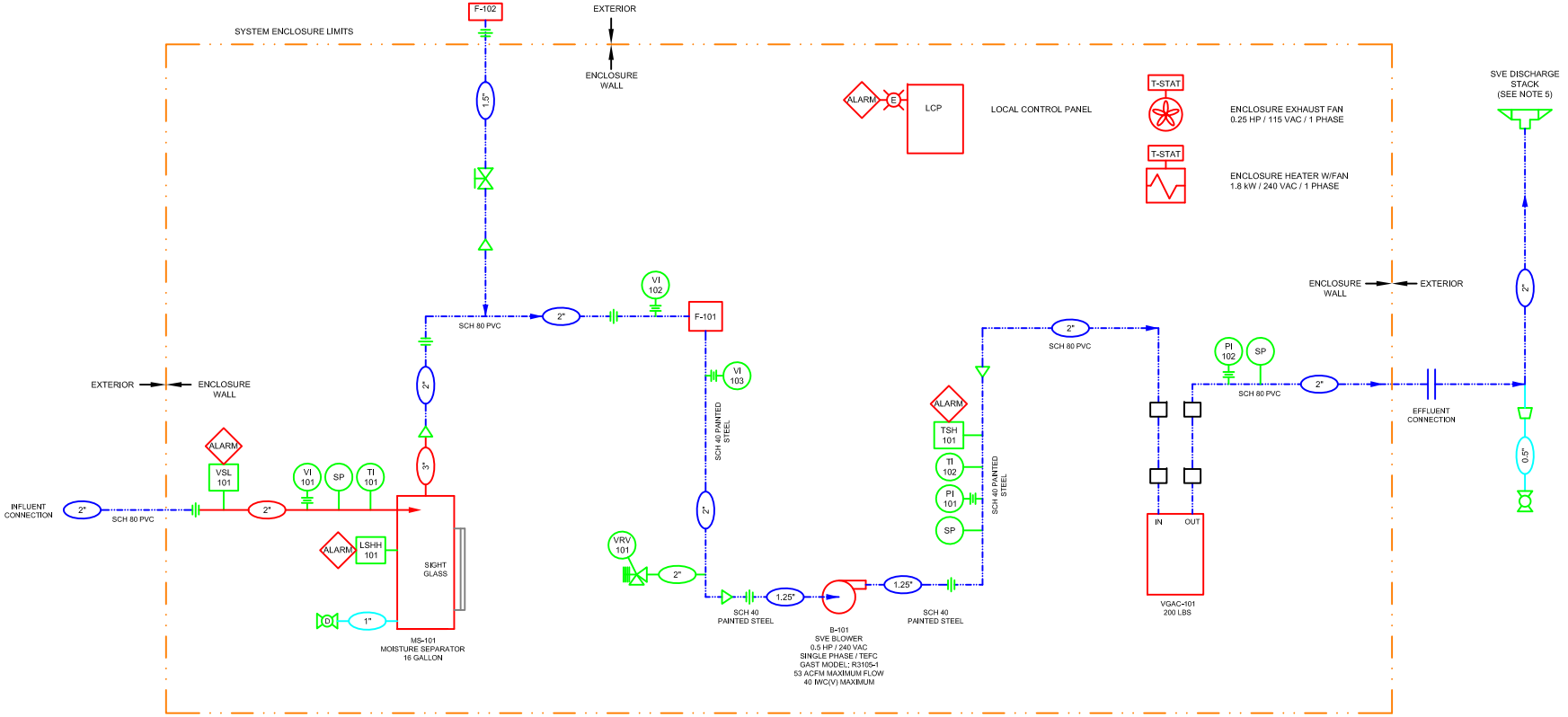
SECTION 2 - MECHANICAL DRAWINGS & TABLE(S)

M-1, PROCESS & INSTRUMENTATION DIAGRAM (P&ID)

T-1, INSTRUMENTATION TABLE

M-2, ENCLOSURE LAYOUT DRAWING, PLAN VIEW

M-3, MOISTURE SEPARATOR (MS) DRAWING



NOTES:
1. PROCESS & INSTRUMENTATION DIAGRAM IS A REPRESENTATIVE DRAWING SHOWING EQUIPMENT SPECIFICATIONS, PROCESS PIPING, VALVES AND INSTRUMENTATION NOT TO BE INTERPRETED AS A LAYOUT DRAWING DEPICTING PLUMBING LOCATION, CONNECTIONS, OR FITTINGS.
2. NEC ELECTRICAL CLASSIFICATION
   - SYSTEM INTERIOR/EXTERIOR NEC NON-CLASSIFIED LOCATION
3. REFER TO TABLE 1 FOR INSTRUMENTATION LIST
4. REFER TO TABLE 2 FOR INTERLOCKS
5. DISCHARGE STACK PIPING AND CONNECTION TO SYSTEM TO BE PROVIDED IN THE FIELD BY OTHERS.

REV	DESCRIPTION	DATE	APPROVED
A	AS BUILT	07-26-19	JAD

REVISIONS

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TITLE
PROCESS & INSTRUMENTATION DIAGRAM

PARSONS / NYSDEC SITE ID #932158
SVE SYSTEM - PINE AVE - NIAGARA FALLS, NY

JOB NO. 19-119

SCALE	SIZE	DWG NO.	SHEET	REV
NTS	C	M-1	1 OF 2	A

INSTRUMENT IDENTIFICATION

INSTRUMENT TYPE / INSTRUMENT DESIGNATION — XX / XXX — LOCALLY MOUNTED INSTRUMENT W / REMOTE DISPLAY

INSTRUMENT TYPE / INSTRUMENT DESIGNATION — XX / XXX — LOCALLY MOUNTED INSTRUMENT W / DISPLAY

INSTRUMENT TYPE / INSTRUMENT DESIGNATION — XX / XXX — LOCALLY MOUNTED SWITCH

INSTRUMENTATION ABBREVIATIONS

ADV	AUTOMATIC DRAIN VALVE
CC	CYCLE COUNTER
CF	COALESCING FILTER
DPI	DIFFERENTIAL PRESSURE INDICATOR
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
FE	FLOW ELEMENT
FI	FLOW INDICATOR
FIT	FLOW INDICATING TRANSMITTER
FM	FLOW METER
FP	FLOW PORT
FS	FLOW SWITCH
FSL	FLOW SWITCH LOW
FT	FLOW TOTALIZER
LI	LEVEL INDICATOR
LIT	LEVEL INDICATING TRANSMITTER
LS	LEVEL SWITCH
LSHH	LEVEL SWITCH HIGH-HIGH
LSH	LEVEL SWITCH HIGH
LSL	LEVEL SWITCH LOW
LSLL	LEVEL SWITCH LOW-LOW
LT	LEVEL TRANSMITTER
MOV	MOTOR OPERATED VALVE
OLH	OIL LEVEL HIGH
OLL	OIL LEVEL LOW
PF	PARTICULATE FILTER
PI	PRESSURE INDICATOR
PIT	PRESSURE INDICATING TRANSMITTER
PRV	PRESSURE REGULATING VALVE
PS	PRESSURE SWITCH
PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
PSV	PRESSURE SAFETY VALVE
PT	PRESSURE TRANSMITTER
SP	SAMPLE PORT
SV	SOLENOID VALVE
TE	TEMPERATURE ELEMENT
TI	TEMPERATURE INDICATOR
TIT	TEMPERATURE INDICATING TRANSMITTER
TS	TEMPERATURE SWITCH
TSH	TEMPERATURE SWITCH HIGH
TSL	TEMPERATURE SWITCH LOW
VFD	VARIABLE FREQUENCY DRIVE
VI	VACUUM INDICATOR
VIT	VACUUM INDICATING TRANSMITTER
VS	VACUUM SWITCH
VSH	VACUUM SWITCH HIGH
VSL	VACUUM SWITCH LOW
VSV	VACUUM SAFETY VALVE

PIPE DESIGNATION

AIR LINE
WATER LINE
WATER LINE HEAT TRACED AND INSULATED
CHEMICAL LINE
PRODUCT LINE
VENT LINE
CONTROL LINE
INTRINSICALLY SAFE LINE
ANALOG LINE
BREAK
FLOW DIRECTION
PIPE SIZE — X"

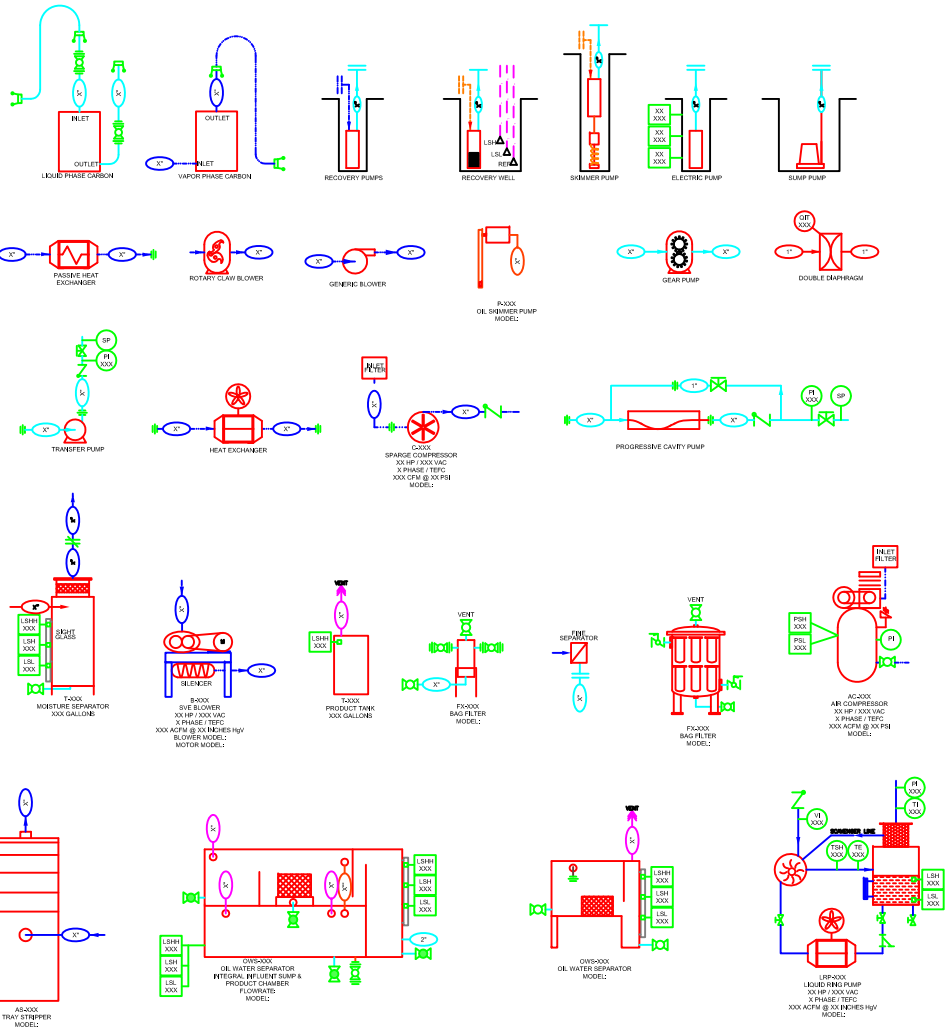
SYMBOLS

ROTAMETER
FLOW METER — FM XXX
ELAPSED TIME METER — ETM
AUTO DIALER — AD
TIMER — T
MOTOR — M
AMP METER — A
REMOTE TELEMETRY SYSTEM — RTS
VARIABLE FREQUENCY DRIVE — VFD
STATIC MIXER
DISCHARGE SILENCER
DILUTION AIR FILTER
INLET/INLINE FILTER
COALESCING FILTER — CF
PARTICULATE FILTER — PF
AUTOMATIC CONDENSATE DRAIN — DR
ALARM DESIGNATION — ALARM
WARNING INDICATION — WARN
MULTIFUNCTION VALVE
INJECT NOZZLE
METERING PUMP INLET CHECK VALVE
INDUSTRIAL INTERCHANGE COUPLER
CONDUCTANCE PROBES
COPPER COIL
HOSE CONNECTION

SYMBOLS CONTINUED

FILTER REGULATOR — FR
METERING PUMP — MP
GLOBE VALVE
GATE VALVE
BALL VALVE/ UNION
BALL VALVE/DRAIN VALVE
CHECK VALVE
RAIN CAP
BUTTERFLY VALVE
Y-STRAINER
RELIEF VALVE
FEMALE CAMLOCK
MALE CAMLOCK
SOLENOID VALVE — SV XXX
PRESSURE REGULATOR
SIPHON BREAK
UNION
CLEAR PVC
MECHANICAL FLOAT
PULSE-DAMPING SNUBBER
PITOT TUBE
SIGHT GLASS
ALARM LIGHT — ALARM
RUN LIGHT — RUN
E-STOP — ESTOP
NEEDLE VALVE
FLANGED CONNECTION
REQUIRED FIELD CONNECTION
FLEX CONNECTOR
CONCENTRIC REDUCER
ECCENTRIC REDUCER
MOTOR OPERATED BUTTERFLY VALVE — MOV XXX
AUTOMATIC DRAIN VALVE — ADV XXX
MOTOR OPERATED VALVE — MOV XXX

SYMBOLS CONTINUED



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A	AS BUILT	07-26-19	JAD

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TITLE: P&I MASTER LEGEND

PARSONS / NYSDEC SITE ID #932158
SVE SYSTEM • PINE AVE • NIAGARA FALLS, NY
JOB NO. 15-119

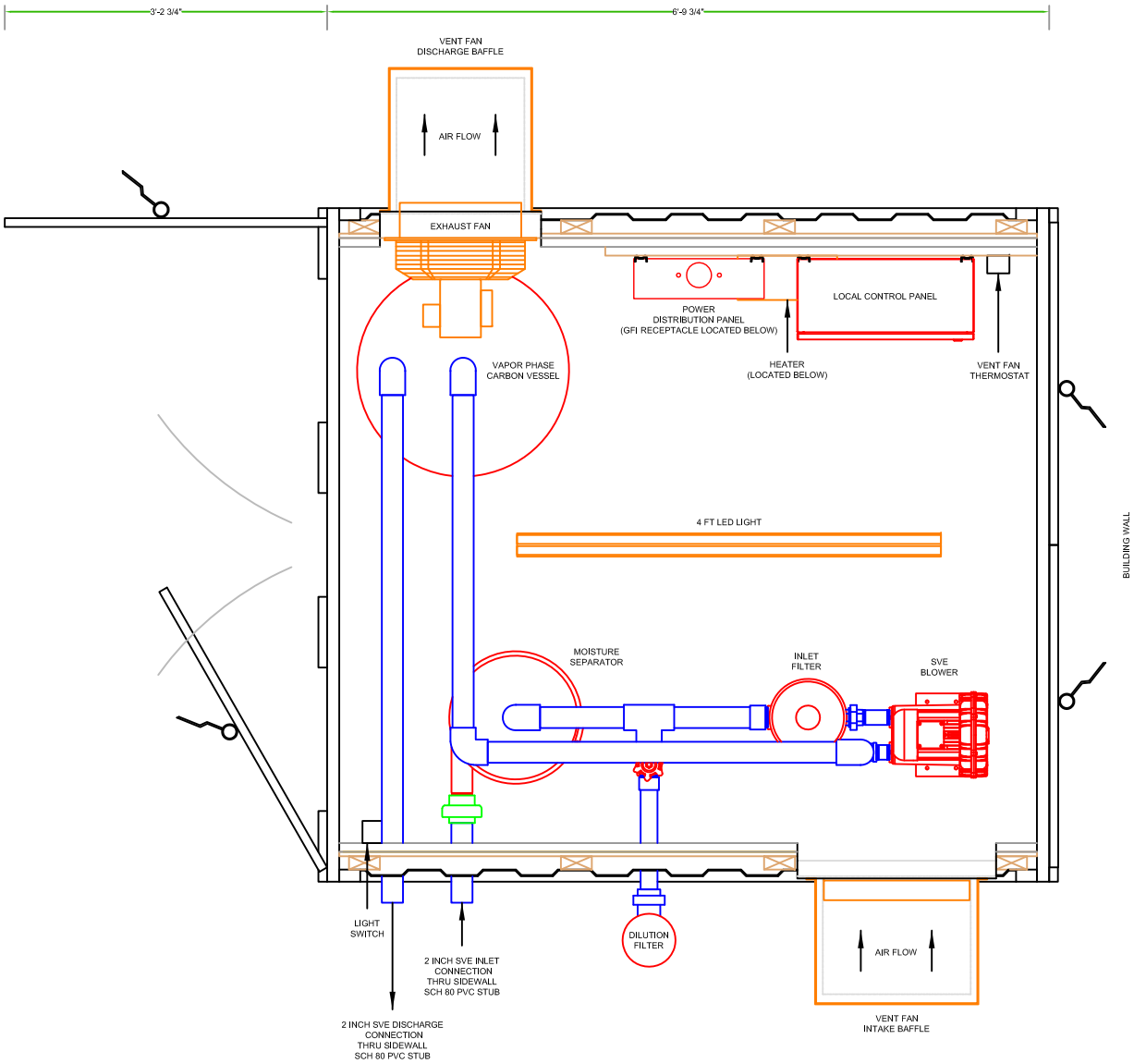
SCALE	SIZE	DWG NO.	SHEET	REV
NTS	D	M-1	2 OF 2	A

TABLE 1
PROCESS INSTRUMENTATION DIAGRAM INSTRUMENT LIST

REV A JULY 2019

19-119 PARSONS - NYSDEC SITE ID #932158 / SVE- PINE AVE - NIAGARA FALLS, NY

TAG	ITEM	MODEL	MANUFACTURER	SPECIFICATION
VI-101 / 103	VACUUM INDICATORS, [-]60 TO 0 IWC(V)	LPG4-D7522N	DWYER	(-)60 TO 0 IWC-V / 2.5 INCH STEEL CASE / BRASS WETTED PARTS / 0.25 INCH BOTTOM MOUNT CONNECTION
LSHH-101	MOISTURE SEPARATOR EMERGENCY HIGH LEVEL SWITCH	M8700	MADISON	HORIZONTAL MOUNT / 1/2 INCH NPT / POLYPROPYLENE FLOAT - S.G. 0.70 / N.C. - HH / SPST / 0.28 AMPS @ 120 VAC / 100 PSI MAX
VSL-101	SVE BLOWER LOW VACUUM SWITCH, 4-20 IN W.C. SET AT 4 IWC(V)	1950-20-2F	DWYER	PRESSURE SWITCH - XP - ADJUSTABLE / 4 TO 20 IWC / 0.4 MAX DEAD BAND @ 4 IWC / (-)40 TO 140 F TEMP RATING / 45 IWC MAX PRESSURE / SPDT SWITCH TYPE / 15AMP @ 125 VAC SWITCH RATING / 0.125 INCH PROCESS
TI-101 / 102	TEMPERATURE INDICATORS, 0 TO 250 F	1NFY4	AV	BIMETAL THERMOMETER / 0 TO 250 F / 2.5 INCH STEM / 3 INCH DIAL / 0.5 INCH MNPT BACK-MOUNT / SS CASE
PI-101,102	PRESSURE INDICATOR, 0-25 IWC	LPG4-D8222N	DWYER	0 - 25 IWC / 2.5 INCH STEEL CASE / BRASS WETTED PARTS / 0.25 INCH BOTTOM MOUNT CONNECTION
TSH-101	BLOWER DISCHARGE HIGH TEMPERATURE SWITCH SET AT 150 F	B54-103	UNITED ELECTRIC	IMMERSION PROBE TEMPERATURE SWITCH / 1-SETPOINT ADJUSTABLE - SPDT / 0° to 225°F / ALUMINUM INDOOR / NON HAZARDOUS / 2-1/8 IN L BRASS PROBE / 3/8 IN NPT / 15 AMP RATING / NEMA 1





CONSTRUCTION NOTES:
1. EXTERIOR COLOR - WHITE
2. SYSTEM INTERIOR IS CLASSIFIED AS A NON HAZARDOUS LOCATION.
3. TO ENSURE PROPER DOOR OPERATION A LEVEL BASE SHOULD BE PROVIDED FOR THE SYSTEM ENCLOSURE.
4. SITE POWER IS 240 VAC SINGLE PHASE.

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	AS BUILT	07-26-19	JAD

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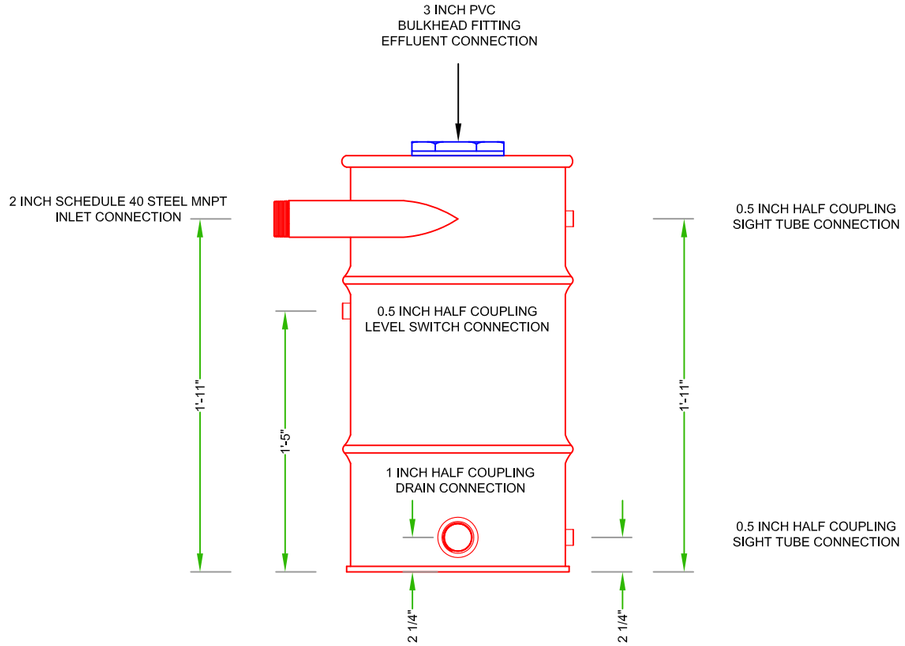
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TITLE: SVE SYSTEM ENCLOSURE LAYOUT DRAWING

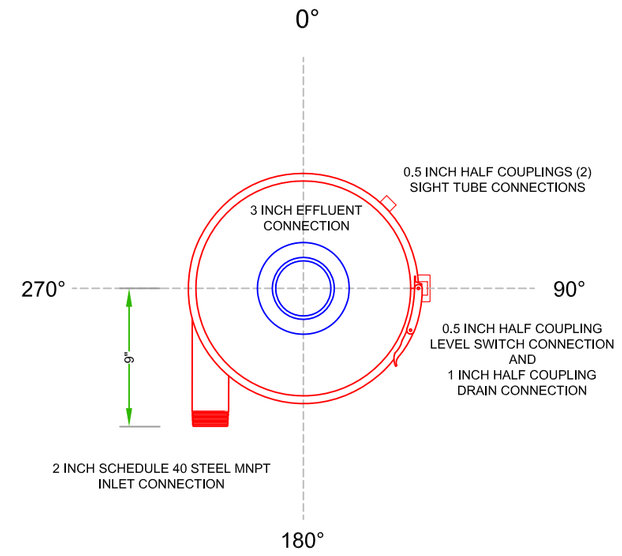
PARSONS / NYSDEC SITE ID #932158
SVE SYSTEM - PINE AVE - NIAGARA FALLS, NY

JOB NO. 19-119

SCALE	SIZE	DWG NO.	SHEET	REV
NTS	C	M-2	1 OF 1	A



MOISTURE SEPARATOR TANK
ELEVATIONAL VIEW



MOISTURE SEPARATOR TANK
PLAN VIEW

-ESTIMATED WEIGHT: 40 LBS
-E-HIGH LIQUID LEVEL: 11 GALLONS ±
-PUMP OUT CAPACITY: N/A
-ESTIMATED OPERATING WEIGHT: 132 LBS ±

REV	DESCRIPTION	DATE	APPROVED
A	AS BUILT	07-26-19	JAD

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DATE	---
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DATE	---

TITLE: 16 GALLON MOISTURE SEPARATOR

PARSONS / NYSDEC SITE ID #932158
SVE SYSTEM - PINE AVE - NIAGARA FALLS, NY

JOB NO. 19-119

SCALE	SIZE	DWG NO.	SHEET	REV
NTS	B	M-3	1 OF 1	A

SECTION 3 - CARGO BOX ENCLOSURE ACCESSORIES

ELECTRIC HEATER w/ THERMOSTAT, 1.8 kW, 240 VAC, 1-PHASE, 8.3 AMP - DAYTON 2HAC7

VENT FAN, 12 IN, 1640 CFM @ 0 IN S.P., 115 VAC, 1.8 AMPS - CANARM AX12-2

VENT FAN THERMOSTAT, 30-110 F ADJUSTABLE - DAYTON 6EDY5

FLUORESCENT VAPOR TIGHT LIGHT FIXTURE - LITHONIA MNSL L48 2LL MVOLT GZN 40K 80CRI

SOUND REDUCTION INSULATION, 1 INCH - AMERICAN ACOUSTICAL HC1.00EBUA3-ANATIO

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Dayton® Architectural Series Fan Forced Wall Heaters and Surface Mounting Frame Accessories

Description

Dayton fan-forced large wall heaters provide electric heat for offices, reception rooms, game rooms, family rooms and similar light-duty commercial and residential applications. These heaters have an integral thermostat so a separate thermostat is not necessary. Heaters include a built-in power disconnect switch for added safety during maintenance and can be surface mounted using optional surface frame.

Specifications

Model Number	Volts	Amps	Watts	BTU/HR	Wire Size
2HAC4	120	8.4/4.2	1000/500	3413/1706	14AWG
2HAC5	120	12.5/6.25	1500/750	5120/2560	12AWG
2HAC6	120	15.0	1800	6143	12AWG
2HAC7	240	8.4/4.2	2000/1000	6826/3413	14AWG
	208	7.3/3.61	1500/750	5120/2560	14AWG
2HAC8	277	7.3/3.61	2000/1000	6826/3413	14AWG
	240	6.25/3.2	1500/750	5120/2560	14AWG
2HAC9	277	5.5/2.75	1500/750	5120/2560	14AWG
	240	4.7/2.35	1125/562	3840/1920	14AWG
2HAD1	208	9.6/4.8	2000/1000	6826/3413	14AWG

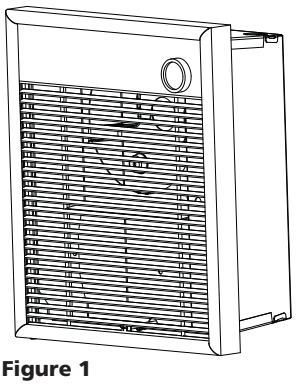
ACCESSORIES (order separately)
2HAD2 Surface Mounting Frame:
Dimensions (HxWxD): 12½" (318 mm) x 10⅜" (264 mm) x 4" (102 mm)
2HAD3 Recess Mounting Frame: 1" (25 mm) recess
2HAD4 Recess Mounting Frame: 2" (50 mm) recess

General Safety Information

⚠WARNING ***Read Carefully - These instructions are written to help you prevent difficulties that might arise during installation of heaters. Studying the instructions first may save you considerable time and money later. Observe the following procedures, and cut your installation time to a minimum.***

To reduce risk of fire or electric shock:

1. Disconnect all power coming to heater at main service panel before wiring or servicing.
2. All wiring must be in accordance with the National and Local Electrical Codes and the heater must be grounded as a precaution against possible electric shock.
3. Verify the power supply voltage coming to heater matches the ratings printed on the heater nameplate before energizing.
4. This heater is hot when in use. To avoid burns, do not let bare skin touch hot surfaces.
5. Do not insert or allow foreign objects to enter any ventilation or exhaust opening as this may cause an electric shock, fire, or damage to the heater.
6. Do not block air intakes or exhaust in any manner. Keep combustible materials, such as crates, drapes, etc., away from heater. Do not install behind doors, furniture, towels, boxes, or in ceilings.
7. A heater has hot and arcing or sparking parts inside. Do not use it in areas where gasoline, paint or flammable liquids are used or stored.



c UL us
File #E154218

Figure 1

8. Use this heater only as described in this manual. Any other use not recommended by the manufacturer may cause fire, electric shock, or injury to persons.
9. This heater is not approved for use in corrosive atmospheres such as marine, green house or chemical storage areas.

SAVE THESE INSTRUCTIONS

⚠WARNING ***To prevent hazard of fire or electrical shock, DO NOT install without back box.***

⚠CAUTION ***To provide for safe operation, the following clearances must be maintained.***

1. Wall Mounting:
   a. Minimum four (4) inches (102 mm) to floor;
   b. Minimum twelve (12) inches (305 mm) to adjacent walls;
   c. Minimum thirty six (36) inches (915 mm) to ceiling.

ENGLISH

ESPAÑOL

FRANÇAIS

Form 5S5984

Printed in China
09663
0508/124/VCPVP

MEP100
05/08
Form #90
5200-11003-000
PPD 10392

Dayton® Architectural Series Fan Forced Wall Heaters and Surface Mounting Frame Accessories

ENGLISH

General Safety Information (Continued)

⚠CAUTION ***The heater is hot when in use. DO NOT install the heater behind door, behind towel rack, in closet, where curtains or drapes could touch or become scorched by heater, or where airflow to heater may be obstructed. Keep electrical cords, bedding, furniture and other combustibles away from heater.***

Installation

The heater is designed for recessed installation in 2" x 4" (50 mm x 101 mm) stud or larger wall sections using the wall box provided. The heater may also be surface mounted by using the Surface Mounting Frame, Model 2HAD2 or semi-recess mounted by using a 2HAD3 (for 1" (25 mm) recess frame) or a 2HAD4 (for 2" (50 mm) recess frame).All three accessories are ordered separately. The heater may be wired with standard building wire (60°C). Refer to "Specifications" (see page 1) for correct supply voltage and wire size.

NOTE: The optimum mounting height for this heater is 18" to 24" (450 to 600 mm) from floor to bottom of back box. DO NOT install closer than 4" (101 mm) from the floor.

For surface or semi-recess mounting, consult Installation Instructions packed with 2HAD2, 2HAD3, and 2HAD4.

INSTALLATION OF BACK BOX IN NEW CONSTRUCTION

NOTE: If the finished wall surface is already up, follow instructions for "Installation of Back Box in Existing Construction".

1. Determine which side of the back box is to be mounted against a stud and bend the tabs at the rear corners out 90 degrees so that the back box will be square with the stud after installation. (See Figure 2).
2. Remove one of the knockouts on socket side of the back box and install a cable or conduit connector.
3. Position back box against side of studs and secure using nails or screws as shown in Figure 2.

NOTE: The back box must be installed with the front edge flush with the finished surface.

4. Run power supply cable through the connector, leaving about 8" of wire inside the box.
5. Connect the supply cable ground wire to green ground screw provided.

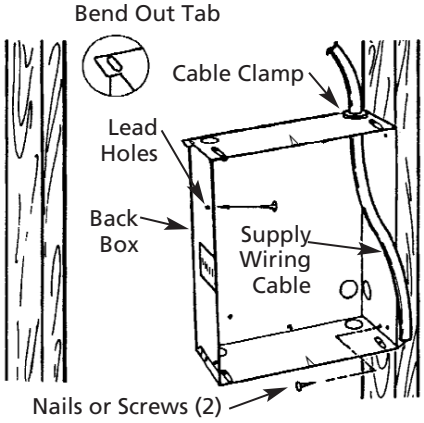


Figure 2

NOTE: Lead holes for a #8 sheet metal screw have been provided in the sides of the back box. After the finished wall or ceiling has been put up, drive a # 8 sheet metal screw (recommended 1" long) through the side of the box not mounted to the stud. This will prevent the back box from pulling out when installing the heater assembly. (See Figure 2).

INSTALLATION OF BACK BOX IN EXISTING CONSTRUCTION

1. Carefully mark and cut a hole measuring 9 3/8" (235 mm) wide by 11 1/8" (283 mm) long. One edge of the hole must be cut along the edge of a stud.

⚠CAUTION ***An electrical shock, fire or water damage could result if wiring or piping is damaged during cutting. Make sure all wiring and piping are clear of area before cutting.***

2. Proceed to No. 1 through 5, see "Installation of Back Box in New Construction".

INSTALLATION OF SURFACE MOUNTING FRAME ACCESSORIES 2HAD2, 2HAD3, AND 2HAD4

NOTE: 2HAD3 or 2HAD4 should be used when a "semi-recessed" wall mounting is desired. All wiring must conform to National and Local Electrical Codes.

INSTALLATION OF BACK BOX IN SURFACE MOUNTING FRAME MODEL 2HAD2

1. Bring power supply cable to heater location leaving at least 8 inches (203 mm) for connecting to heater.

Models 2HAC4 thru 2HAC9, 2HAD1 and 2HAD2 thru 2HAD4

Installation (Continued)

2. If power supply is provided from inside wall, remove knockout in back of box, install cable clamp leaving at least 8 inches (203 mm) of cable inside back box. Secure back box to building structure using (4) holes in back box. (See Figure 3).
3. If power supply is provided by a surface system (such as conduit, surface raceways, etc.) remove knockout in back box in side to match up with supply location. Install appropriate cable connector to match surface system and secure back box at least 8 inches (203 mm) of cable inside box.

NOTE: In order to match up with clearance knockouts in surface frame, the knockouts located in corner next to the knockout in back of box must be used. (See Figure 3).

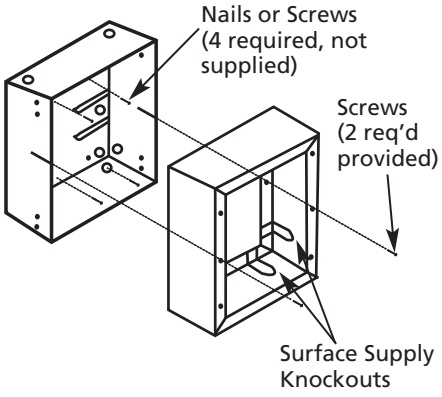


Figure 3

4. If supply is by surface system, remove the clearance knockout in surface frame so frame will slide over supply. (See Figure 3).
5. Slide surface frame over back box and proceed to "Installation and Wiring of Heater/Fan Assembly".

INSTALLATION OF SEMI-RECESSED SLEEVE

Refer to "Installation of Back Box in New Construction" or "Installation of Back Box in Existing Construction".

The 2HAD3 requires a minimum wall depth clearance of 2¾" (70 mm) and the 2HAD4 requires a minimum wall depth clearance of 1¾" (44.5 mm). When using semi-recessed sleeves the back box will need to be shimmed to ensure that it is square with the wall.

NOTE: When using the 2HAD3 the front edge of the back box must extend 1" (25.4 mm) beyond the finished wall surface. When using the 2HAD4 the front edge of the back box must extend 2" (51 mm) beyond the finished wall surface. (See Figure 4).

NOTE: Shims must be used between the side of the back box and the wall stud to ensure the back box installation is square with the finished wall.

1. Position the semi-recessed sleeve on the back box and attach with two (2) #6 x 3/8" (3.5 mm x 9.5 mm) screws (provided) through holes as indicated in Figure 4.
2. Finish the installation by referring to "Installation and Wiring of Heater/Fan Assembly".

NOTE: Mount the fan deck using the holes in the corner at the thermostat and the corner opposite (diagonal) the thermostat.

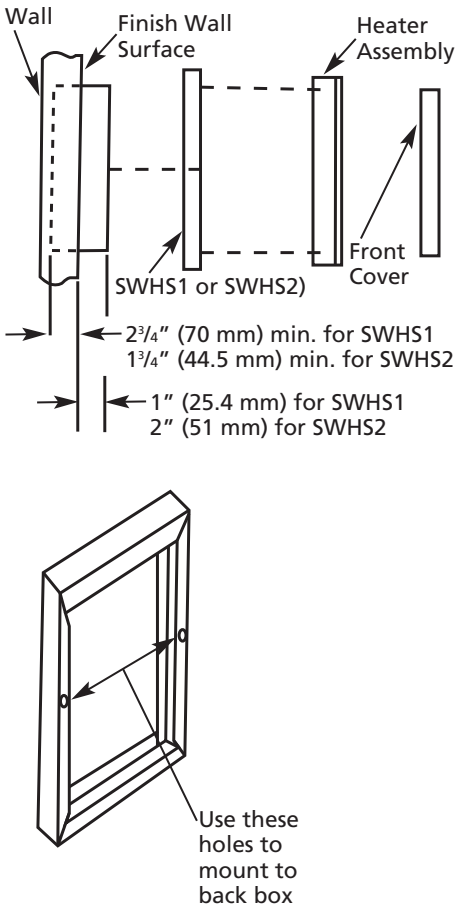


Figure 4

FIELD CONVERSION FOR LOWER WATTAGE RATING

NOTE: Refer to "Specifications" for lower wattage ratings which are available.

To convert heater to lower wattage rating, completely remove red jumper wire from both heating elements (see Figure 5, page 4). Discard this jumper. Be sure remaining wires are securely connected.

Dayton® Architectural Series Fan Forced Wall Heaters and Surface Mounting Frame Accessories

ENGLISH

Installation (Continued)

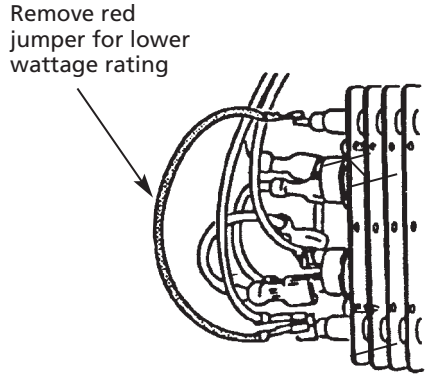


Figure 5

INSTALLATION AND WIRING OF HEATER / FAN ASSEMBLY

1. Following wiring diagram (Figure 6) connect supply wiring to heater lead wires in back box.

NOTE: For 120 and 277 volt heaters connect the white neutral supply lead to the heaters white pigtail lead, and connect the black supply lead to the heaters black pigtail lead. For 208 and 240 volt heaters change the color of the heaters white pigtail lead to black by wrapping with black electrical tape. (Most electrical codes require the supply leads to be connected to black leads). Then connect the two black supply leads to the two black receptacle leads.

2. Secure supply ground wire under green ground screw in back box.
3. Two (2) metal retaining straps are provided in back box to secure wires. Carefully fold supply and heater wires along side of box and secure by bending the retaining straps up and over the wires.
4. Insert wiring plug from heater/fan assembly into socket in back box.

⚠CAUTION ***The supply and heater wires in the back box could be damaged if they are allowed to contact the heating element or fan blade. Be sure wires are secured by bending the straps up and over the wires to hold them in place.***

5. Fit heater/fan assembly into back box and secure in place with (2) screws provided through the center slots in the fan assembly.

NOTE: Use the screws provided by the factory to install fan deck to the back box.

INSTALLATION OF FRONT COVER (GRILLE) AND THERMOSTAT KNOB

1. Attach grille bracket with screw provided in the top part of the back box as shown in Figure 7, page 5.
2. Mount top portion of the grille over the grille bracket and push down until grille is secure.
3. Insert screw through bottom of grille louver to mounting hole and tighten screw.

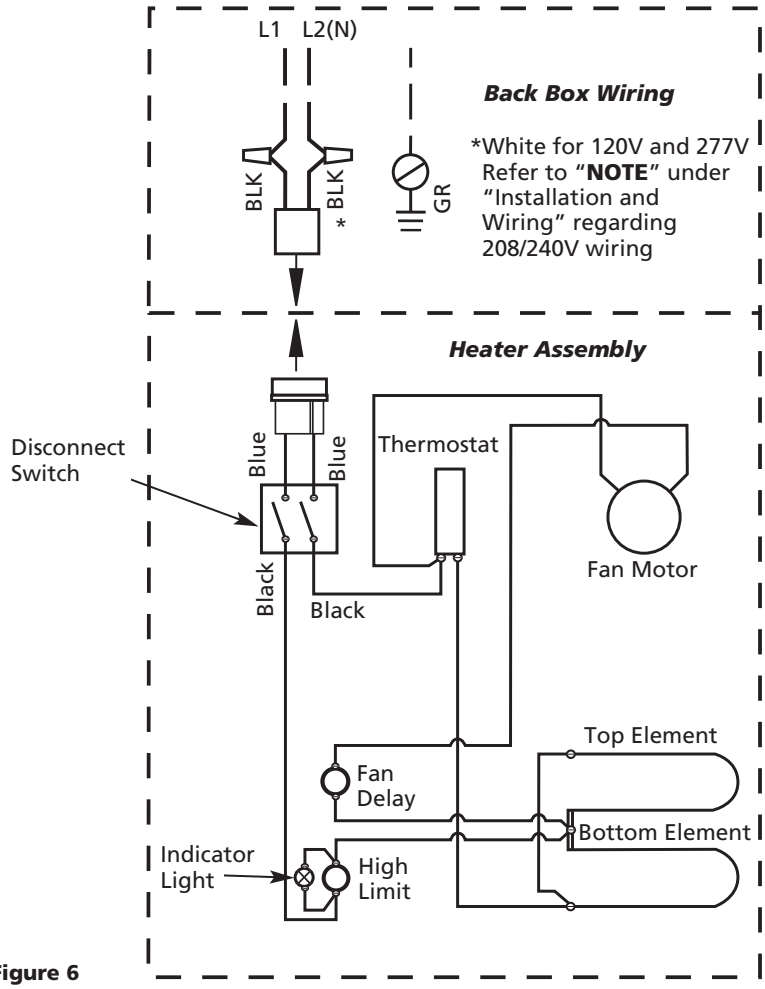


Figure 6

Models 2HAC4 thru 2HAC9, 2HAD1 and 2HAD2 thru 2HAD4

Installation (Continued)

4. Fit the thermostat knob on to the thermostat shaft and push into place.

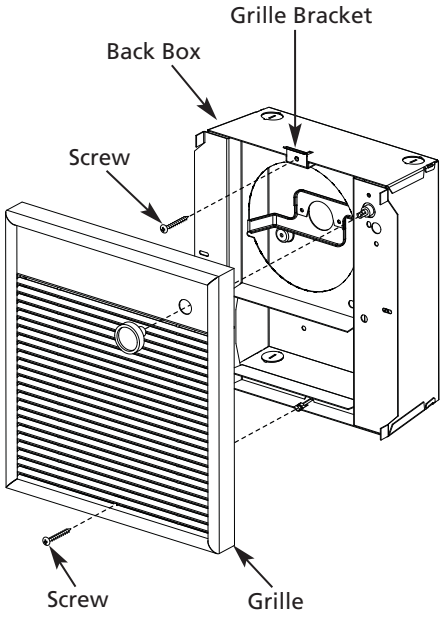


Figure 7

Operation

1. After heater is completely assembled, push the disconnect switch to the "on" position and rotate thermostat knob counterclockwise until control stops. This is the minimum heat setting.
2. Turn power supply to heater "ON" at main switch panel.
3. Heater should not operate. If it operates, disconnect power and re-check wiring.
4. Rotate thermostat clockwise until it stops (maximum heat setting) and wait at least 2 minutes. Fan control will delay fan coming on until element is warm.
5. If heater and fan do not come on, disconnect power and check wiring.
6. Allow heater to continue to operate until room temperature reaches desired comfort level. Then rotate thermostat knob counterclockwise slowly until thermostat clicks off. Fan will continue to operate for a minute or so until element cools.
7. It may be necessary to readjust thermostat a time or so until exact comfort level is attained. Rotation in the clockwise direction will increase the amount of time the heater will produce heat. Rotation in the counterclockwise direction will reduce the amount of time the heater is on.

NOTE: For best results, the heater should be left "ON" constantly during the heating season as the thermostat, when properly set, will maintain the desired temperature. In the full counter-clockwise position the heater will remain off until the room temperature drops well below freezing.

OPERATIONAL NOTICE

Your heater is equipped with an automatic reset high limit control that will automatically turn the heater off to prevent a fire if the heater overheats. Should this occur, the indicator light will illuminate and will continue to shine until the limit resets.

⚠CAUTION ***The illuminated indicator light signifies the heater has been subjected to some abnormal condition. Check heater to insure that it has not been blocked in any manner (if so, remove blockage). If there is no indication of blockage, it is recommended the heater be checked by a reputable electrician or repair service to insure the heater has not been damaged.***

Maintenance

Your heater is designed for years of trouble-free operation and requires no special maintenance other than occasional cleaning. The motor is permanently lubricated.

CLEANING

Once each year, the heater should be cleaned to remove dust and other foreign material which has collected during the heating season, as follows:

1. Turn power off at main switch.
2. Remove thermostat knob and grille.
3. Use vacuum cleaner with brush attachment to remove dust and dirt that has accumulated in heater (especially around element and fan blade). Do not use water or any cleaners to clean heater components.
4. Replace grille and thermostat knob.
5. Wipe grille clean with a damp cloth. DO NOT use waxes or any cleaners that leave a residue since these may discolor during heater operation.
6. Turn the main line switch on at the switch panel to restore power to heater. The heater is now ready for another season of operation.

For Repair Parts, call 1-800-323-0620

24 hours a day – 365 days a year

Please provide following information:
-Model number
-Serial number (if any)
-Part description and number as shown in parts list

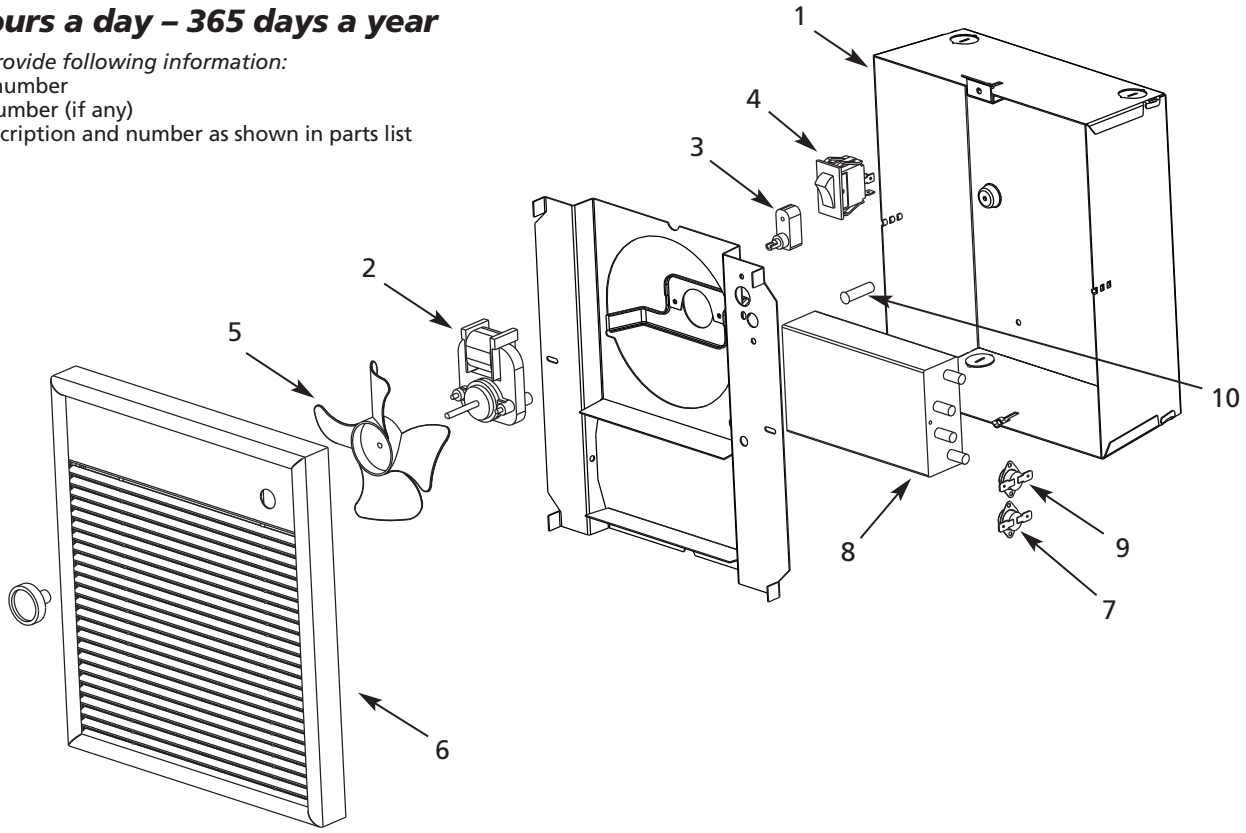


Figure 8 – Repair Parts Illustration for Architectural Series Fan Forced Wall Heaters

Repair Parts List for Architectural Series Fan Forced Wall Heaters

Ref. No.	Description	Part Number for Models: 2HAC4	2HAC5	2HAC6	2HAC7	2HAC8	2HAC9	2HAD1	Qty.
1	Back Box	12172027010	12172027010	12172027010	12172027010	12172027010	12172027010	12172027010	1
2	Motor: 120V	490062001	490062001	490062001	–	–	–	–	1
	208V	–	–	–	–	–	–	490062002	1
	240V	–	–	–	490062003	–	–	–	1
	277V	–	–	–	–	490062004	490062004	–	1
3	Thermostat	58132001000	58132001000	58132022000	58132001000	58132001000	58132001000	58132001000	1
4	Disconnect Switch	52162021000	52162021000	52162021000	52162021000	52162021000	52162021000	52162021000	1
5	Blade	490061001	490061001	490061001	490061001	490061001	490061001	490061001	1
6	Grille	25012075002	25012075002	25012075002	25012075002	25012075002	25012075002	25012075002	1
7	Fan Delay	410074000	410074000	410074000	410074000	410074000	410074000	410074000	1
8	Element: 120V/1000W	302023801	–	–	–	–	–	–	1
	120V/1500W	–	302023802	–	–	–	–	–	1
	120V/1800W	–	–	302023808	–	–	–	–	1
	208V/2000W	–	–	–	–	–	–	302023804	1
	240V/2000W	–	–	–	302023805	–	–	–	1
	277V/1500W	–	–	–	–	–	302023803	–	1
	277V/2000W	–	–	–	–	302023806	–	–	1
9	Hi Limit	410143000	410143000	410143000	410143000	410143000	410143000	410143000	1
10	Hi Limit Light: 120V	35102008003	35102008003	35102008003	–	–	–	–	1
	208V	–	–	–	–	–	–	35102008002	1
	240V	–	–	–	35102008002	–	–	–	1
	277V	–	–	–	–	35102008002	35102008002	–	1
Δ	Parts Bag: Knob, Screws, Plug Button	12052069001	12052069001	12052069001	12052069001	12052069001	12052069001	12052069001	1

(Δ) Not shown.

Notes

Dayton® Architectural Series Fan Forced Wall Heaters and Surface Mounting Frame Accessories

ENGLISH

LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. *DAYTON® ARCHITECTURAL SERIES FAN FORCED WALL HEATERS AND SURFACE MOUNTING FRAME ACCESSORIES, MODELS COVERED IN THIS MANUAL, ARE WARRANTED BY DAYTON ELECTRIC MFG. CO. (DAYTON) TO THE ORIGINAL USER AGAINST DEFECTS IN WORKMANSHIP OR MATERIALS UNDER NORMAL USE FOR ONE YEAR AFTER DATE OF PURCHASE. ANY PART WHICH IS DETERMINED TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP AND RETURNED TO AN AUTHORIZED SERVICE LOCATION, AS DAYTON DESIGNATES, SHIPPING COSTS PREPAID, WILL BE, AS THE EXCLUSIVE REMEDY, REPAIRED OR REPLACED AT DAYTON'S OPTION. FOR LIMITED WARRANTY CLAIM PROCEDURES, SEE "PROMPT DISPOSITION" BELOW. THIS LIMITED WARRANTY GIVES PURCHASERS SPECIFIC LEGAL RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION.*

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Prompt Disposition. *A good faith effort will be made for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom the product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date, and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.*

Manufactured for Dayton Electric Mfg. Co., 5959 W. Howard St., Niles, Illinois 60714-4014 U.S.A.

Manufactured for Dayton Electric Mfg. Co.
Niles, Illinois 60714 U.S.A.

AX - SHUTTER MOUNTED FANS

Designed for Industrial, Commercial & Farming applications.



AX SERIES MOTOR

The AX series exhaust fan is a sturdily constructed, direct drive, horizontal discharge fan that is typically used for general ventilation of factories, garages, warehouses and other industrial or commercial buildings. The AX fans are available in multiple single-speed variations as well as two-speed and variable speed models.
The AX series housings are constructed of heavy duty aluminum with built in shutters that automatically open when the fan starts and gravity closes when the fan stops.

Some models now available with optional DC volt motor. Call for details.



EXPLOSION PROOF MOTOR

Intertek

FEATURES

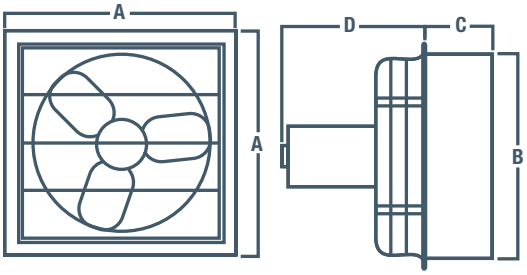
- Sturdily constructed from all-aluminum extrusions.
- 8" - 24" models have heavy wire chrome plated OSHA guards on intake side of fan.
  30", 36" & 42" models have grey powder coated guards.
- Totally enclosed air over motor with overload protection.
- Ships fully assembled.

FANS UP TO 24" CAN SHIP VIA UPS

DIMENSIONS

MODEL	A	B	C	D	
				AX	AX-4~
AX08	14 3/4"	11 3/4"	5"	7"	-
AX10	14 3/4"	11 3/4"	5"	7"	-
AX12	16 3/4"	13 3/4"	5"	11"	13 3/4"
AX14	18 3/4"	15 3/4"	5"	11"	13 3/4"
AX16	20 3/4"	17 3/4"	5"	11"	13 3/4"
AX18	22 3/4"	19 3/4"	5"	12"	14"
AX20	24 3/4"	21 3/4"	5"	12"	14"
AX24	28 3/4"	25 3/4"	5"	12"	13 3/4"
AX30	35 1/4"	32 3/4"	5"	13"	-
AX36	41 1/4"	38 3/4"	5"	12"	-
AX42	47 3/4"	44 3/4"	5"	11"	-

~ Explosion Proof Motor, 50 Hz or 3 phase



SPECIFICATIONS

SINGLE PHASE	THREE PHASE	BLADE DIAMETER	RPM	HP (SINGLE PHASE)	VOLTAGE (SINGLE PHASE)	AMPS (FLA) (SINGLE PHASE)	WEIGHT (LBS)	dB(A) @5 ft	CFM @ STATIC PRESSURE				FRAMING DIMENSIONS
									0.00"	0.10"	0.125"	0.25"	
SINGLE SPEED - VARIABLE SPEED FANS													
AX12-1V	AX12-1*	12"	1700	1/3	115/230	5.0/2.5	26	63	1650	1560	1525	1400	14" X 14"
AX12-1VHE	-	12"	1450	1/15	115	1.0	22	60	1350	1290	1275	1150	14" X 14"
AX14-1V	AX14-1*	14"	1700	1/3	115/230	5.0/2.5	29	67	2170	2030	1950	1900	16" X 16"
AX14-1VHE	-	14"	1450	1/15	115	1.0	25	64	1600	1525	1500	1300	16" X 16"
AX16-1V	AX16-1*	16"	1700	1/3	115/230	5.0/2.5	30	68	2570	2470	2410	2260	18" X 18"
AX16-1VHE	-	16"	1450	1/15	115	1.0	26	63	1850	1750	1700	1550	18" X 18"
AX18-1V	AX18-1*	18"	1700	1/3	115/230	3.8/1.9	36	71	3150	3000	2900	2575	20" X 20"
AX20-1V	AX20-1*	20"	1700	1/3	115/230	3.8/1.9	39	77	3620	3420	3340	3120	22" X 22"
AX24-1V	--	24"	1100	1/3	115/230	4.4/2.2	43	72	5500	5400	5310	5100	26" X 26"
--	AX24-1*	24"	1100	1/3	--	--	43	77	5500	5400	5310	5100	26" X 26"
SINGLE SPEED FANS													
AX12-2	--	12"	1625	1/4	115	1.8	27	63	1640	1540	1510	1390	14" X 14"
AX14-2	--	14"	1625	1/4	115	1.8	30	67	2170	2070	2030	1860	16" X 16"
AX16-2	--	16"	1625	1/4	115	1.8	31	68	2370	2270	2210	2060	18" X 18"
AX18-2	--	18"	1625	1/3	115	4.0	37	73	3200	3090	3040	2920	20" X 20"
AX20-2	--	20"	1625	1/3	115	4.0	39	77	3420	3220	3170	2920	22" X 22"
AX24-2	--	24"	1100	1/3	115	5.4	45	70	5000	4500	4300	3600	26" X 26"
AX30-2	--	30"	1100	1/3	115/230	4.4/2.2	72	82	8000	7000	6000	5000	33" X 33"
AX36-7	AX36-7M**	36"	850	1/2	115/230	6.6/3.3	88	72	10000	8500	8000	6200	39" X 39"
AX42-7	--	42"	850	1	230	5.5	122	84	14900	13550	13210	10800	45" X 45"
TWO SPEED FANS													
AX08-3	--	8"	1600/1300	1/20	115	1.7	14	48	360/300	270/150	230/110	--	12" X 12"
AX10-3	--	10"	1600/1300	1/20	115	1.7	14	56	690/580	590/460	570/390	--	12" X 12"
AX12-3	--	12"	1725/1140	1/4	115	3.4	27	64	1670/1100	1600/950	1575/900	1450/625	14" X 14"
AX14-3	--	14"	1725/1140	1/4	115	3.4	31	67	2190/1440	2080/1325	2000/1300	1950/850	16" X 16"
AX16-3	--	16"	1725/1140	1/4	115	3.4	34	69	2580/1770	2480/1620	2430/1560	2270/1020	18" X 18"
AX18-3	--	18"	1725/1140	1/3	115	5.3/2.9	38	74	3200/2310	3050/2030	2950/1960	2625/1750	20" X 20"
AX20-3	--	20"	1725/1140	1/3	115	5.3/2.9	41	77	3640/2420	3440/2270	3360/2210	3140/1890	22" X 22"
SINGLE SPEED EXPLOSION PROOF FANS (Explosion Proof Motors are DIVISION 1 - CLASS 1 - GROUP C & D and CLASS 2 - GROUP F & G)													
Class I, Group C - Atmospheres containing ethyl ether, ethylene, gases or vapors of equivalent hazard. **Class I, Group D -** Atmospheres such as acetone, ammonia, benzene, butane, cyclopropane, ethanol, gasoline, hexane, methane, natural gas, naphtha, propane, or gases or vapors of equivalent hazard. **Class II Group F -** Atmospheres containing carbonaceous dust, including carbon black, charcoal, coal, or coke dusts that have more than 8% total entrapped volatiles, or dusts that have been sensitized by other materials so that they present an explosion hazard. **Class II Group G** - Atmospheres containing combustible dusts not included in group E or F, including flour, grain, wood, plastic and chemicals.												
AX12-4	AX12-4*	12"	1725	1/3	115/208-230	6.6/3.1-3.3	49	63	1670	1600	1575	1450	14" X 14"
AX14-4	AX14-4*	14"	1725	1/3	115/208-230	6.6/3.1-3.3	49	67	2190	2080	2000	1950	16" X 16"
AX16-4	AX16-4*	16"	1725	1/3	115/208-230	6.6/3.1-3.3	51	68	2580	2480	2430	2270	18" X 18"
AX18-4	AX18-4*	18"	1725	1/3	115/208-230	6.6/3.1-3.3	56	73	3200	3050	2950	2625	20" X 20"
AX20-4	AX20-4*	20"	1725	1/3	115/208-230	6.6/3.1-3.3	57	77	3640	3440	3360	3140	22" X 22"
AX24-4	AX24-4*	24"	1725	1/3	115/208-230	6.6/3.1-3.3	57	77	5520	5410	5330	5130	26" X 26"

For three phase motors, substitute "*" with "M" for 230/460 volt or "P" for 575 volt
**NOTE: AX36-7M is only available in 208-230/460 volt for three phase applications
Other voltages in single or three phase are available. 50HZ voltages are available. Consult factory.

ACCESSORIES

- Speed controls
- Thermostats
- Front guard
- Weather hoods

For a complete listing on all available accessories, see page D16.
For a complete listing of all available hoods, see page D11.
For all available control options, see Controls & Thermostats tab.

INSTALLATION FOR AX & P WALL EXHAUST FANS

WALL OPENING SIZES

The Canarm/LFI P series fans can be mounted either horizontally or vertically. AX-series fans are to be mounted horizontally only. When mounting the AX series fan, the wall opening should be ½" larger than the shutter box size. The P series wall opening should be 1-3/4" larger than the fan blade diameter. Both the AX & P series fans are meant to be installed on the inside of an outside wall; the fan should be centered over the opening and lagged to the wall.

PRE-INSTALLATION CHECK

Prior to installation of a fan, please check carefully for any damage. If damage is found, do not install. Check and tighten all nuts, bolts, set screws, etc., which may have loosened during shipping and handling. Before connecting to the power source, check the motor nameplate, and the power supply, to ensure that they are both rated for the same power supply. Make sure the propeller turns freely without striking the fan frame or any other objects.

AIR EXHAUST AND SUPPLY

The AX series fan is to be used as an exhaust fan only *(not suitable for supply air)*.

The P series fan is primarily used as an exhaust fan, however, the single speed (*1700 rpm models*) can be set up to act as a supply fan. This is accomplished by mounting the blade opposite to the exhaust configuration and reversing the rotation of the motor. When used as a supply fan, in conjunction with a shutter, the shutter must be motorized. To attach the shutter to the fan, a wall sleeve may be required. For wall opening sizes on P series with sleeve refer to catalogue sheet.

VARIABLE SPEED FANS

Canarm/LFI AX-1V, AX-1HE and P-1V, P-1VHE Series are variable speed or single speed. These are the only models that can be used with a speed controller. When using the AX-1V or AX-1VHE Series with a variable speed controller care should be taken not to reduce the speed to low. If the airflow is reduced significantly the shutters may not open properly. This may cause motor problems.
For variable operation, a suitable variable speed control is required.

OPERATION AND MAINTENANCE FOR AX & P SERIES WALL FANS

REGULAR MAINTENANCE

Fans should periodically be cleaned to remove accumulated dust, dirt, or any other foreign matter. If rust or corrosion is found, the affected area or part should be cleaned and refinished or replaced.

Periodically - check and tighten all nuts, bolts, set screws, etc.
Periodically - check for damage or worn parts and replace.

***** CAUTION *****

All local, provincial or national codes should be checked. Ensure that all wiring, guarding and fan applications comply with all applicable codes. The proper type and class of fan and motor must be used in Explosive/Hazardous Applications.

WARRANTY AND LIMITATION OF LIABILITY

If the products sold hereunder are defective at the time of delivery in material or workmanship and written notice is given to Seller within one year after shipment, Seller, at its option will repair or replace the products, give Buyer an equitable credit, or refund the purchase price for such products determined by Seller to be defective, provided that the products shall not been altered or repaired after shipment to Buyer by anyone except Sellers authorized employees. ***SELLER'S TOTAL RESPONSIBILITY SHALL NOT EXCEED THE SALES PRICE OF THE DEFECTIVE PRODUCTS. TRANSPORTATION TO RETURN DEFECTIVE PRODUCTS IS TO BE PREPAID***. If Buyer fails to give such notice within one year after shipment, any claims for breach of warranty by Seller shall be barred. Products manufactured by others but furnished by Seller are limited to original manufacturer's warranty. Canarm/LFI Limited assumes no liability for resultant damages, labour and service charges of any kind arising from the use of its products. On equipment furnished by Canarm/LFI Limited but manufactured by others, such as motors, the warranty will be honored by the manufacturer hereof.

CANARM LTD. - Corporate Office
2157 Parkedale Ave., PO Box 367 Brockville, ON Canada K6V 5V6 Tel: (613)342-5424 Fax: 1-800-263-4598
www.canarm.com | hvacsales@canarm.ca

Operating Instructions | **1UHH1 thru 1UHH4, 2NNR5 thru 2NNR9, 2NNT1 thru 2NNT5, and 6EDY3 thru 6EDY7**

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Dayton® Line Voltage Thermostats

Description

These Line Voltage Thermostats are designed for reliable use in heating, ventilating, and refrigeration applications. A broad temperature range between -30° and +120°F (-34° and +49°C) allows for a wide range of heating, ventilating, and refrigeration applications. Snap-acting contacts are in a dust protected enclosure. SPDT switches are enclosed and protected.

Specifications

ELECTRICAL RATINGS

AC Voltage	120 V	208 V	240 V	277 V
Models 1UHH1 thru 1UHH4, 2NNR5 thru 2NNR7, 2NNR9, 2NNT1 thru 2NNT4 & 6EDY3 thru 6EDY7:				
Inductive Full Load Amps	16.0	9.2	8.0	–
Locked Rotor Amps	96.0	55.2	48.0	–
Models 2NNR8 & 2NNT5:				
Inductive Full Load Amps	12.0	–	–	–
Locked Rotor Amps	72.0	–	–	–
Resistive Load Amps (not lamp loads):				
Models 1UHH1, 1UHH2, 2NNR6, 2NNR7, 2NNR9 & 2NNT3:				
SPST (when connected)	22.0	22.0	22.0	22.0
SPDT (when connected)	16.0	9.2	8.0	7.2
Models 1UHH3, 2NNT1 & 6EDY4:				
SPDT Rating	16.0	9.2	8.0	7.2
Models 1UHH4, 2NNR5 & 2NNT4:				
SPST Rating	22.0	22.0	22.0	22.0
Models 2NNR8 & 2NNT5*:				
SPST Rating	12.0	–	–	–

Pilot Duty . . . . . 125 VA 24/600 VAC

(*) Model numbers 2NNR8 and 2NNT5 include a 6 foot "Piggyback" cord.

NOTE: When used as a two circuit switch, the total load must not exceed 2000 VA.



Figure 1

General Safety Information

⚠ WARNING ***Disconnect all power before installing or servicing this product. If the power disconnect is out of view, lock it in the open position and tag it to prevent unexpected restarting of power. Failure to do so could result in fatal electric shock.***

1. Special attention must be given to any grounding information on this product and to other equipment associated with its installation and use. To ensure a proper ground, the grounding means must be checked by a qualified electrician.
2. Be certain that the electrical ratings of the thermostat conform to the power source and the load(s) being controlled. Loads that exceed the rating of the thermostat should be handled with a suitable rated relay or motor starter.

⚠ WARNING ***Do not depend upon the thermostat as the sole means of disconnecting power when installing or servicing the product it is controlling. Always disconnect power at the main circuit breaker as described above. Failure to do so could result in fatal electric shock.***

3. This thermostat is intended ONLY for permanent installation in accordance with the United States National Electrical Code (NEC), all applicable local codes and ordinances, and all sections of this manual. All wiring should be done by a qualified electrician, using copper wire only.

⚠ WARNING ***These thermostats are intended for general heating, ventilating, and refrigeration ONLY. They must NOT be used in potentially dangerous locations such as flammable, explosive, chemical laden areas or in wet atmospheres.***

⚠ WARNING ***These thermostats are designed for use as operating controls only. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add devices (safety, limit controls) or systems (supervisory alarm systems) that protect against, or warn of control failure.***

ADDITIONAL SPECIFICATIONS

Model Number	Application	Switch	Temperature Range	Temperature Differential*	Sensor	Construction	Housing Rating
1UHH1	Heat/Cool	SPDT	30 to 110°F (-1 to 43°C)	3.5°F	Fixed	Polymeric	1
1UHH2	Heat/Cool	SPDT	30 to 110°F (-1 to 43°C)	3.5°F	Fixed	Steel	1
1UHH3	2 Stage Heat/Cool	SPDT/SPDT	30 to 110°F (-1 to 43°C)	3.5°F	Fixed	Steel	1
1UHH4	Cool Only	SPST	30 to 110°F (-1 to 43°C)	3.5°F	Fixed	Steel	1
2NNR5	Refrigeration	SPST	-30 to 90°F (-34 to 32°C)	3.5°F	Extended	Steel	1
2NNR6	Heat/Cool	SPDT	0 to 120°F (-18 to 49°C)	3.5°F	Extended	Polymeric	4X
2NNR7	Heat/Cool	SPDT	-30 to 90°F (-34 to 32°C)	3.5°F	Extended	Steel	1
2NNR8	Heat Only	SPST	35 to 95°F (2 to 35°C)	3.5°F	Fixed	Steel	1
2NNR9	Heat/Cool	SPDT	30 to 110°F (-1 to 43°C)	3.5°F	Fixed	Stainless Steel	1
2NNT1	2 Stage Heat/Cool	SPDT/SPDT	30 to 110°F (-1 to 43°C)	3.5°F	Fixed	Stainless Steel	1
2NNT2	Cool Only	SPST	30 to 110°F (-1 to 43°C)	3.5°F	Fixed	Stainless Steel	1
2NNT3	Heat/Cool	SPDT	-30 to 90°F (-34 to 32°C)	3.5°F	Extended	Stainless Steel	1
2NNT4	Refrigeration	SPST	-30 to 90°F (-34 to 32°C)	3.5°F	Extended	Stainless Steel	1
2NNT5	Heat Only	SPST	35 to 95°F (2 to 35°C)	3.5°F	Fixed	Stainless Steel	1
6EDY3	Heat/Cool	SPDT	30 to 110°F (-1 to 43°C)	3.5 to 12°F	Fixed	Polymeric	1
6EDY4	2 Stage Heat/Cool	SPDT/SPDT	30 to 110°F (-1 to 43°C)	3.5°F	Fixed	Polymeric	1
6EDY5	Heat/Cool	SPDT	30 to 110°F (-1 to 43°C)	3.5°F	Fixed	Polymeric	1
6EDY7	Heat/Cool	SPDT	30 to 110°F (-1 to 43°C)	3.5 to 12°F	Extended	Steel	1

(*) Temperature between stages on Models 1UHH3, 2NNT1 and 6EDY4 is fixed. The low stage makes contacts R (Red) to Y (Yellow) at the knob setting while the high stage makes contact approximately 3°F above the knob setting.

General Safety Information (Continued)

⚠ WARNING ***In cases where personal injury or property damage may result from malfunction of the thermostat, a backup system must be used. Where critical or high value products are maintained, an approved temperature limit should be wired in series with this thermostat. In less critical applications, a second thermostat with alarm contacts may be used for redundancy.***

Installation

LOCATION

Mount this product 5 to 6 feet above the floor so it will be exposed to the average temperature of the controlled space. Do not mount control where it could be affected by unusual heat or cold such as in sunlight or beside equipment. Avoid locations near a door, window or other opening. Do not mount on an outside wall. When the thermostat is mounted with coil pointed down, it is protected from falling objects, dirt, and debris.

MOUNTING – FIXED INSTALLATIONS

Four mounting holes for fixed installations are found in the back of the case. On rough surfaces use the top mounting holes only. When mounting this control on uneven surfaces, when all four mounting screws are tightened, the housing may deform enough to affect the thermostat calibration and operation.

⚠ CAUTION ***Do not dent or deform the sensor coil of this control. A dent or deformation will change the calibration and cause the control to cycle at a temperature lower than the knob setting.***

NOTE: Dimensions and performance specifications appearing below (Figures 2 and 2A) are nominal and are subject to accepted manufacturing tolerances and application variables.

MOUNTING – PORTABLE HEATER THERMOSTATS (2NNR8 & 2NNT5)

Thermostat model numbers 2NNR8 and 2NNT5 are designed to be used with portable heaters. They are supplied with a 6 foot (1.8 m) HSJ class cord and a "series" plug for 120 volt 12 amp service. The thermostat case is connected to the green "ground" wire.

⚠ CAUTION ***To reduce the risk of electric shock, this product has a grounding type plug that has a third (grounding) pin. This plug will only fit into a grounding type power outlet. If the plug does not fit into the outlet, contact a qualified electrician to install the proper outlet. Do not change the plug in any way.***

To install this device, unfold the bail wire on the back of the thermostat and hang the unit where it can be plugged into a 3-prong (grounded) power supply. Then plug the heater into the "piggyback" portion of the thermostat plug.

For best results, be sure the thermostat is suitably mounted above the floor and away from the heater discharge. If an extension cord is required, use only 3-wire grounded extension cords with adequate wire size.

⚠ WARNING ***Do not allow the thermostat to be placed on the floor where it could come in contact with moisture, or be stepped on. Doing so could result in a fatal electric shock.***

MOUNTING – RAINTIGHT THERMOSTAT INSTALLATION (2NNR6)

Thermostat model 2NNR6 is designed for use in wet or humid environments. It meets NEMA 4X requirements when used with approved watertight connectors (not included).

To ensure water tightness, a UL listed cord seal or conduit hub marked "4X" should be tightened onto the conduit before installing in the enclosure. A drip loop must be used to prevent moisture from entering the thermostat housing. Make certain that all connectors are securely tightened.

When reinstalling the cover, make sure it is squarely positioned over the gasket. Then uniformly tighten the screws, evenly compressing the gasket to provide a watertight seal. Do not overtighten.

MOUNTING – EXTENDABLE BULB THERMOSTAT INSTALLATION (2NNR5, 2NNR6, 2NNR7, 2NNT3 & 2NNT4)

Thermostat models 2NNR5, 2NNR6, 2NNR7, 2NNT3 and 2NNT4 have a sensor bulb attached to the end of an extendable capillary tube. The sensor bulb on these units is designed to monitor temperature remotely from the control module.

When extending the sensor, avoid bending or kinking the extendable capillary tube, as this will affect the accuracy of the unit. Make sure that any excess tubing is coiled beneath the thermostat control module.

The control module should be located in a convenient place within a distance easily reached by the thermostats' extendable sensing bulb.

Care should be taken to install the sensing bulb where it will sense the average ambient temperature of the area to be controlled.

For **remote room installations**, mount the sensing bulb in a location where the ambient air can easily circulate around the sensing bulb. For **cold room installations**, the sensing bulb may also be mounted on the suction side of a refrigerant line, and secured in position.

For **duct installations**, position the sensing bulb where it is in the primary air stream and avoid mounting the sensing bulb close to hot pipes, cooling coils, or other areas which may cause an inaccurate reading.

For **tank installations**, the sensing bulb can be inserted directly into the tank fluid. Place the sensing bulb in a location where the liquid will circulate around the sensing bulb and where it is not affected by extraneous temperatures. When mounting in a tank:

- First drain the system.
- Then screw an approved boiler plug into a pipe tapping (not supplied).
- Position a packing nut on the capillary tubing of the sensing bulb.
- Slip the sensing bulb completely through the boiler plug.
- Put the composition disc and slotted brass washers on the capillary tubing.
- Slide the assembly into the boiler plug and tighten the packing nut.
- Refill the system and check for leaks.
- Coil the excess capillary tubing, taking care to avoid any crimps.

For models 6EDY3 and 6EDY7 you may adjust the difference between the on and off temperature by moving the tab to "MIN" for a 3 degree difference or up to "MAX" for a 12 degree difference (see Figure 3).

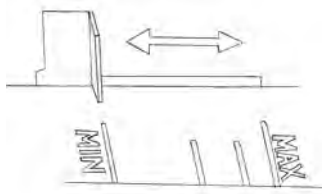


Figure 3 – Adjustable Differential Models

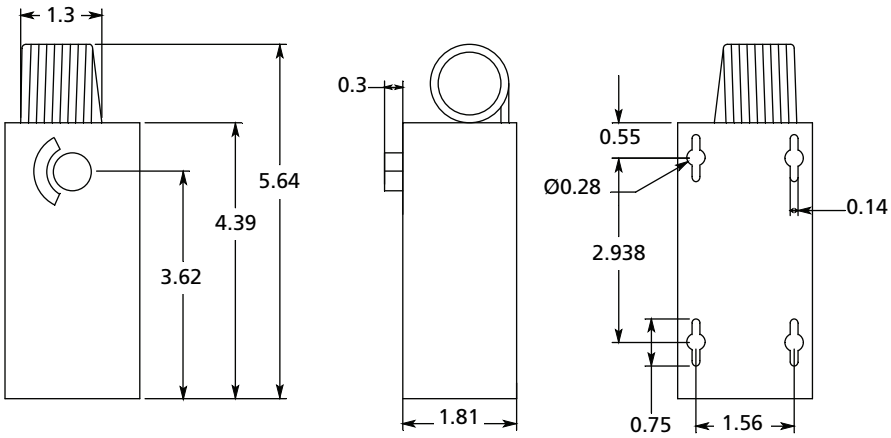


Figure 2 – Dimensions of Metal Cased Thermostat (in inches)

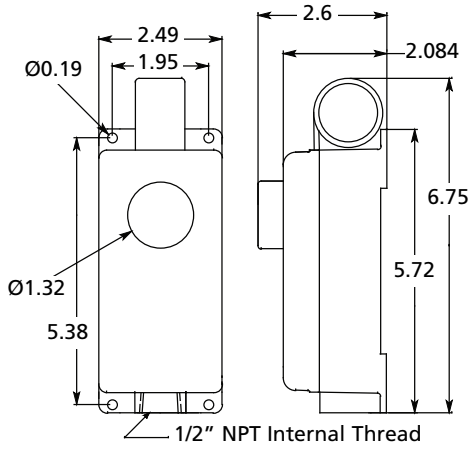


Figure 2A – Plastic Cased Thermostat

Installation (Continued)

WIRING

IMPORTANT: All wiring should be done in accordance with applicable codes, ordinances and regulations. Use disconnect device and overload protection to assure safe installation complying with local and national codes. Figures 4, 5 and 6 illustrate typical wiring for control of heating, cooling, refrigeration, and combination heating/cooling control systems (copper conductors only).

NOTE: Letters **R**, **B** and **Y** (red, blue and yellow) refer to color of paint dots near terminals (see Figures 4-11).

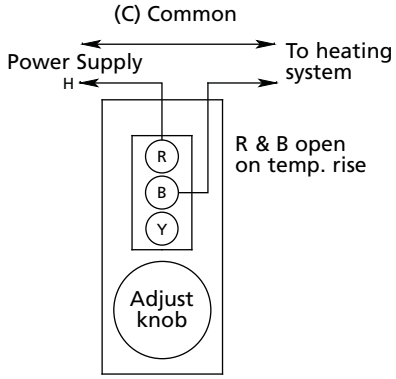


Figure 4 – Connection for a Typical Heating Control Circuit

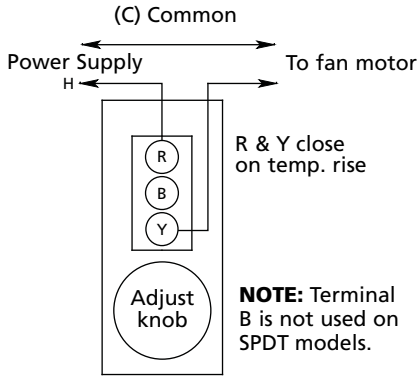
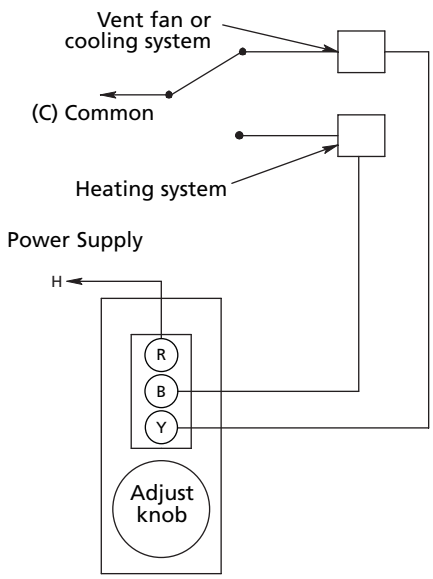


Figure 5 – Connection for a Typical Refrigeration, Ventilation or Cooling Control Circuit



NOTE: SPDT switch not included.

Figure 6 – SPDT Thermostats in Control of Heating and Ventilation Systems

Figure 7 shows wiring for controlling a two-speed ventilating fan. When the control element reaches the knob settings, the low temperature switch starts the fan on low speed. If the ambient temperature continues to rise, the high temperature switch supplies power to the high-speed motor winding while disconnecting the low-speed winding.

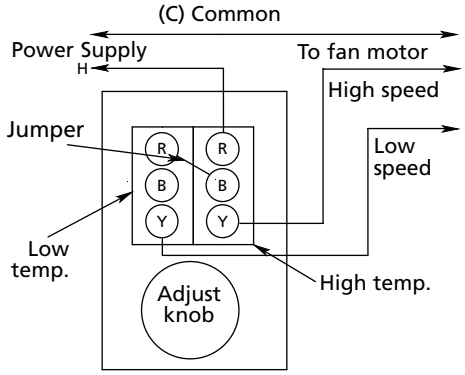


Figure 7 – Two-stage SPDT/SPDT Thermostats in Control of a Two-speed Ventilating Fan

Figure 8 shows a typical SPDT/SPDT hook-up for a two-volume fan application. The damper motor will be energized when the temperature reaches the knob setting. If the temperature continues to rise, the fan motor will be energized by the high temperature switch.

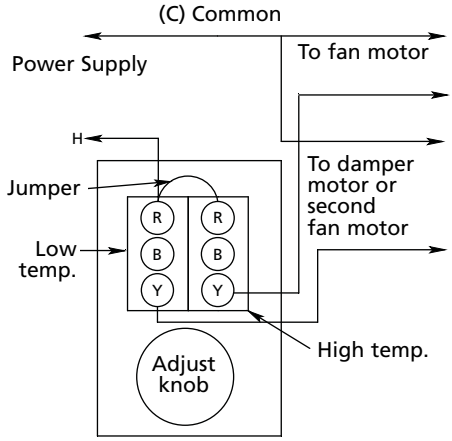


Figure 8 – Two-stage SPDT/SPDT Thermostats in Control of a Single-speed Ventilating Fan and Volume Increase Damper Motor

SPDT/SPDT units can also be used to control a combination heating and ventilating or cooling system, as shown in Figure 9. A temperature increase to the knob setting will turn off the heating system when the R-B contacts of the low temperature switch break. An increase in temperature of about 3°F will turn on the fan or cooling system through the R-Y contacts of the high temperature switch.

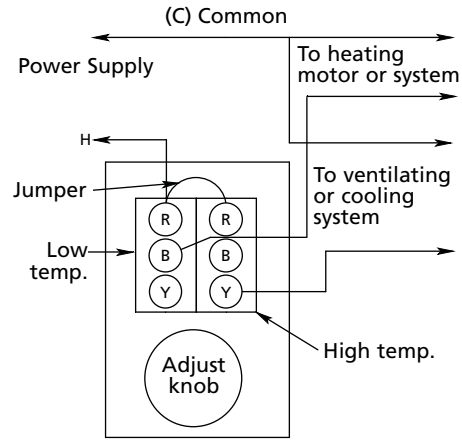


Figure 9 – Two-stage SPDT/SPDT Thermostats with Automatic Changeover in Control of Heating and Cooling Systems

Figure 10 illustrates typical wiring for SPDT/SPDT units for control of two heating stages. As the ambient temperature decreases to the knob setting, the high temperature switch will make R-B contact, turning on the first stage of heating. If the temperature continues to drop (about 3°F) the low temperature switch will make R-B contact, turning on the second stage of heating.

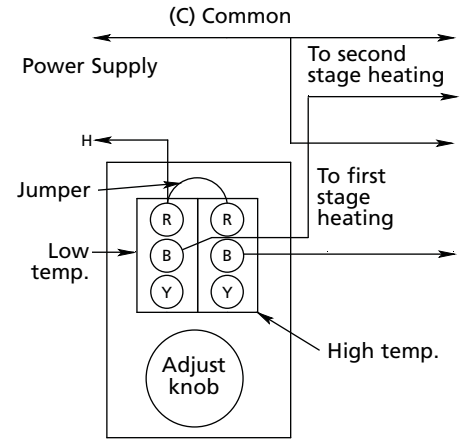


Figure 10 – Two-stage SPDT/SPDT Thermostats in Control of a Two-stage Heating System

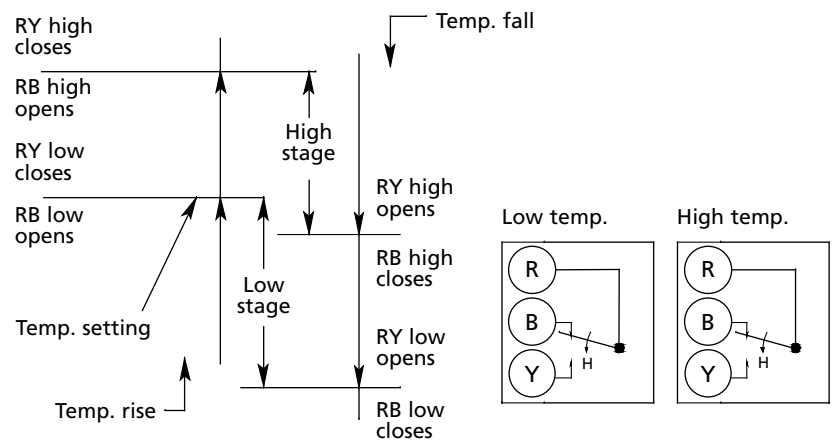


Figure 11 – Operational Sequence of Two-stage SPDT/SPDT Thermostats

Installation (Continued)

CHECKOUT PROCEDURE

Before leaving the installation, a complete operating cycle should be observed to ensure that all components are functioning properly. Check for correct operation in the following sequence:

1. When thermostats are connected to Refrigeration, Ventilating, or Cooling Systems: Turn knob clockwise to a setting above ambient temperature. Fan or Cooling System should be off. When knob is turned counterclockwise (to lower temperature setting), the fan or cooling system should turn on approximately at the knob setting.
2. When thermostats are connected to a Heating device or system: Turn knob clockwise above the ambient temperature; the heating unit should be on. When knob is turned counterclockwise (to lower temperature setting), the heating unit should turn off approximately at the knob setting.
3. Thermostats with SPDT/SPDT 2 Stage switching: If connection is similar to Figure 7, fan should start at approximately ambient temperature and should change to high speed, as the knob is turned counterclockwise to a lower temperature setting. If wiring is similar to Figure 8, the damper should open as the knob is turned counterclockwise (to lower temperature setting). The devices should act in reverse sequence when the knob is turned clockwise.

This product is set at the factory for the maximum temperature scale setting. The maximum temperature setting can be reduced by removing the cover, slightly loosening the adjusting screw adjacent to the adjust knob, and moving the adjusting screw along the slot to the desired maximum temperture. Once this is done, retighten the adjusting screw and replace the cover.

Operation

Figure 11, page 3 illustrates the operation of thermostats with SPDT/SPDT 2 Stage switching. On a temperature increase to the knob setting, the circuit between R and Y of the low stage switch (RYL) closes. Simultaneously the circuit between R and B (RBL) opens.

On a further increase in temperature the high stage switch operates and closes (RYH) while simultaneously opening (RBH). The reverse sequencing takes place with a decrease in temperature.

NOTE: No Replacement parts available. Do not attempt any field repair.

LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. *DAYTON® LINE VOLTAGE THERMOSTATS, MODELS COVERED IN THIS MANUAL, ARE WARRANTED BY DAYTON ELECTRIC MFG. CO. (DAYTON) TO THE ORIGINAL USER AGAINST DEFECTS IN WORKMANSHIP OR MATERIALS UNDER NORMAL USE FOR ONE YEAR AFTER DATE OF PURCHASE. ANY PART WHICH IS DETERMINED TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP AND RETURNED TO AN AUTHORIZED SERVICE LOCATION, AS DAYTON DESIGNATES, SHIPPING COSTS PREPAID, WILL BE, AS THE EXCLUSIVE REMEDY, REPAIRED OR REPLACED AT DAYTON'S OPTION. FOR LIMITED WARRANTY CLAIM PROCEDURES, SEE "PROMPT DISPOSITION" BELOW. THIS LIMITED WARRANTY GIVES PURCHASERS SPECIFIC LEGAL RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION.*

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Certain aspects of disclaimers are not applicable to consumer products; e.g., (a) some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you; (b) also, some jurisdictions do not allow a limitation on how long an implied warranty lasts, consequently the above limitation may not apply to you; and (c) by law, during the period of this Limited Warranty, any implied warranties of implied merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

Prompt Disposition. *A good faith effort will be made for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom the product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date, and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.*

Manufactured for Dayton Electric Mfg. Co., 5959 W. Howard St., Niles, Illinois 60714-4014 U.S.A.

Troubleshooting Chart

Symptom	Possible Cause(s)	Corrective Action
Cooling:		
Cooling or fan does not operate	1. Improper wiring 2. Knob set above ambient temperature	1. Check wiring 2. Set knob to lower temperature
Cooling or fan runs continuously	1. Improper wiring 2. Knob set below ambient temperature	1. Check wiring 2. Set knob to higher temperature
System operates in reverse	Improper wiring	Check wiring
Heating:		
Heating unit does not operate	1. Improper wiring 2. Knob set below ambient temperature	1. Check wiring 2. Set knob to higher temperature
Heating unit runs continuously	1. Improper wiring 2. Knob set above ambient temperature	1. Check wiring 2. Set knob to lower temperature
System operates in reverse	Improper wiring	Check wiring

LITHONIA LIGHTING®

Catalog Number	
Notes	
Type	

MNSL

LED Striplight



FEATURES & SPECIFICATIONS

INTENDED USE — Inspired by classic fluorescent strip channels, this LED fixture offers a traditional appearance that incorporates the latest technology. Available in several lengths and lumen packages. Ideal for use in commercial, retail, office, warehouse and display applications. **Certain airborne contaminants can diminish the integrity of acrylic and/or polycarbonate. Click here for Acrylic-Polycarbonate Compatibility table for suitable uses.**

CONSTRUCTION — Compact-design channel and cover are formed from code-gauge cold-rolled steel. Easy to install row aligner included with 2LL versions for continuous row mounting. High-gloss, baked white enamel finish (standard).

OPTICS — LEDs provided 80+ color rendering index (CRI) at 4000K. Diffuse polycarbonate lens provides smooth, linear illumination which is designed to resemble the classic look of traditional fluorescent tubes.

ELECTRICAL — The fixture is tested to withstand a maximum line surge of 2.5kV/.2kA ring wave for indoor locations. For applications requiring higher level of protection, additional surge protection must be provided. Fixture features a non-dimming driver.

INSTALLATION — Fixture may be surface or suspension mounted with appropriate mounting options (see accessories). Aligner locks in place for easy continuous row mounting.

LISTINGS — CSA certified to US and Canadian safety standards and listed suitable for damp locations. Minimum starting temperature at -40˚F (-40˚C). Maximum ambient operating temperature of 95˚F (35˚C) for 4' and 8' models. Maximum ambient operating temperature of 104˚F (40˚C) for 2' models. Lighting facts listed. ENERGY STAR® certified product.

WARRANTY — 5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

NOTE: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25˚C.

Specifications subject to change without notice.

DAMP LOCATION™ · ENERGY STAR · LED lighting facts · LED

ORDERING INFORMATION

Lead times will vary depending on options selected. Consult with your sales representative.

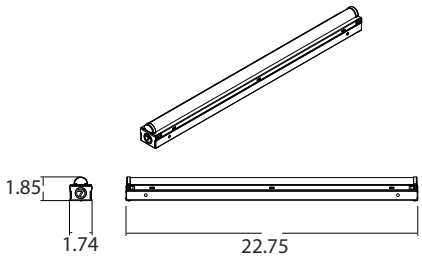
Catalog number	Description	Lumens	Wattage	Voltage	Driver	Color Temperature	Color Rendering Index	Pallet Quantity
MNSL L23 1LL 120V GZN 40K 80CRI M6	2' 1-Light 120V LED Strip Light	1150	12	120V	Generic **non-dimming** driver	40K 4000K	80CRI 80 CRI	576
MNSL L46 1LL MVOLT GZN 40K 80CRI M6	4' 1-Light MVOLT LED Strip Light	2300	25	MVOLT (120-277V)	Generic **non-dimming** driver	40K 4000K	80CRI 80 CRI	288
MNSL L48 2LL MVOLT GZN 40K 80CRI M6	4' 2-Light MVOLT LED Strip Light	4500	50	MVOLT (120-277V)	Generic **non-dimming** driver	40K 4000K	80CRI 80 CRI	168
MNSL L96 2LL MVOLT GZN 40K 80CRI	8' 2-Light MVOLT LED Strip Light	8200	90	MVOLT (120-277V)	Generic **non-dimming** driver	40K 4000K	80CRI 80 CRI	252

Accessories: *Order as separate catalog number.*

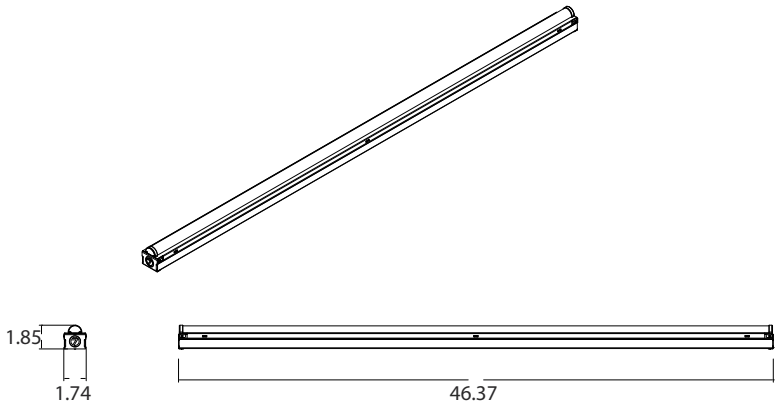
HC36	Chain hanger and jack chain, 36" (pair)
ZACVH	Aircraft cable 10' (one pair)
SQ	Swivel-stem hanger (specify length in 2" increments)

DIMENSIONS

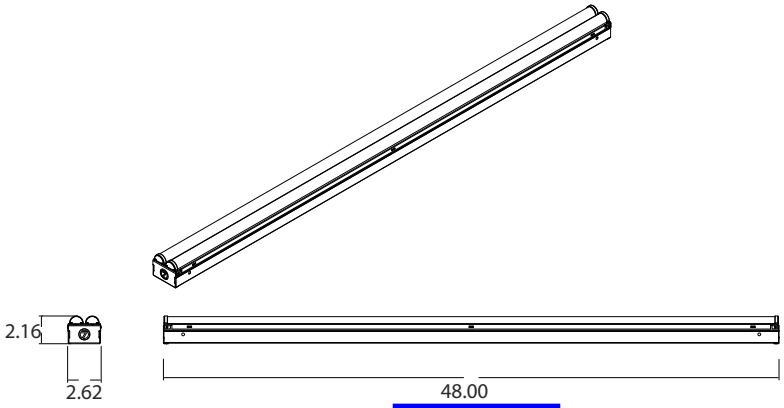
All dimensions are inches (centimeters) unless otherwise indicated.



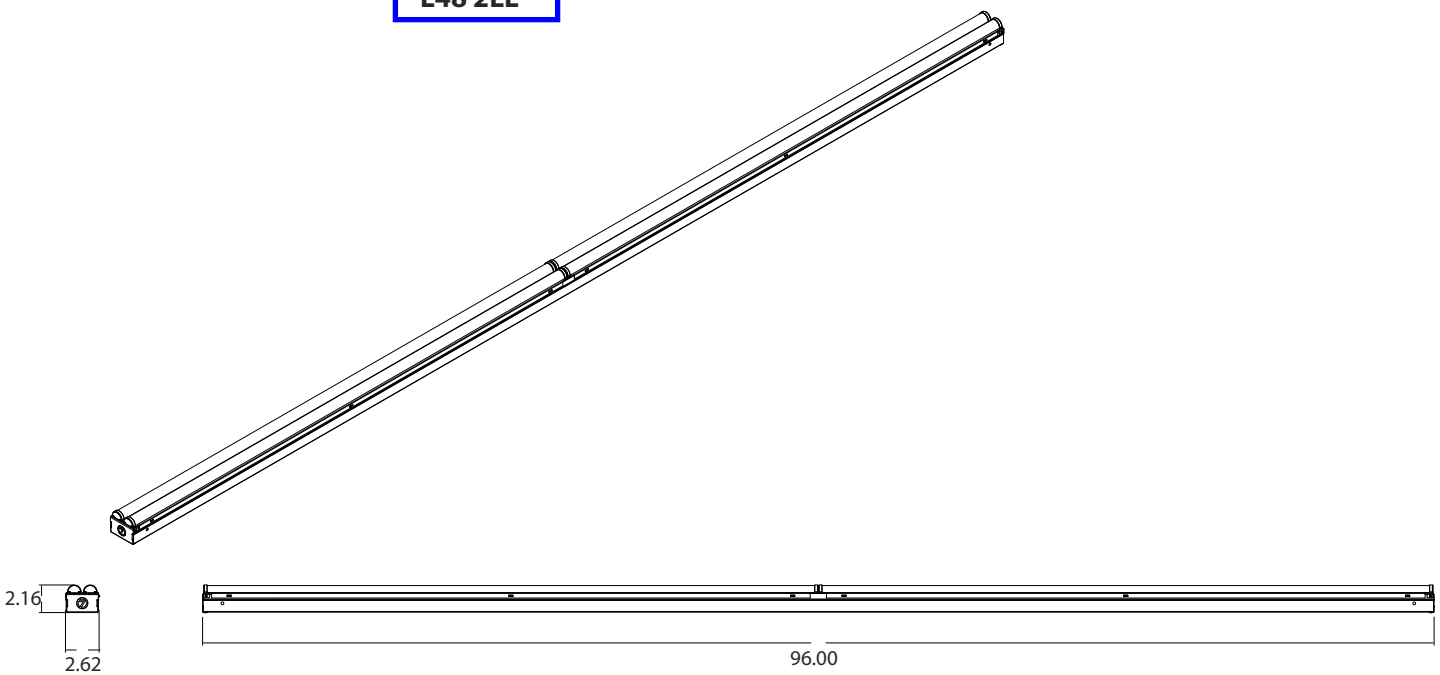
L23 1LL



L46 1LL



L48 2LL



L96 2LL

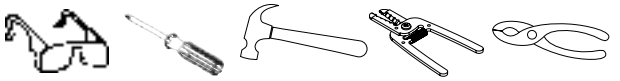
PHOTOMETRICS

See www.lithonia.com.

INDUSTRIAL: One Lithonia Way Conyers, GA 30012 Phone: 800.315.4963 www.lithonia.com Email:techsupport-Industrial@acuitybrands.com © 2017-2018 Acuity Brands Lighting, Inc. All rights reserved. Rev. 10/17/18

INSTALLATION FIGURES

REQUIRED TOOLS



FIXTURE PACKING LIST

Description	Quantity
1) Housing Assembly	1
2) Wireway Cover Assembly	1
2) Wireway Cover Assembly (L96 2LL)	2
3) Wirenuts*	3
4) LED Driver	1
5) Alignment Bracket- 2LL only	1
6) Bracket Screw- 2LL only	2

*Contained in Part Packs

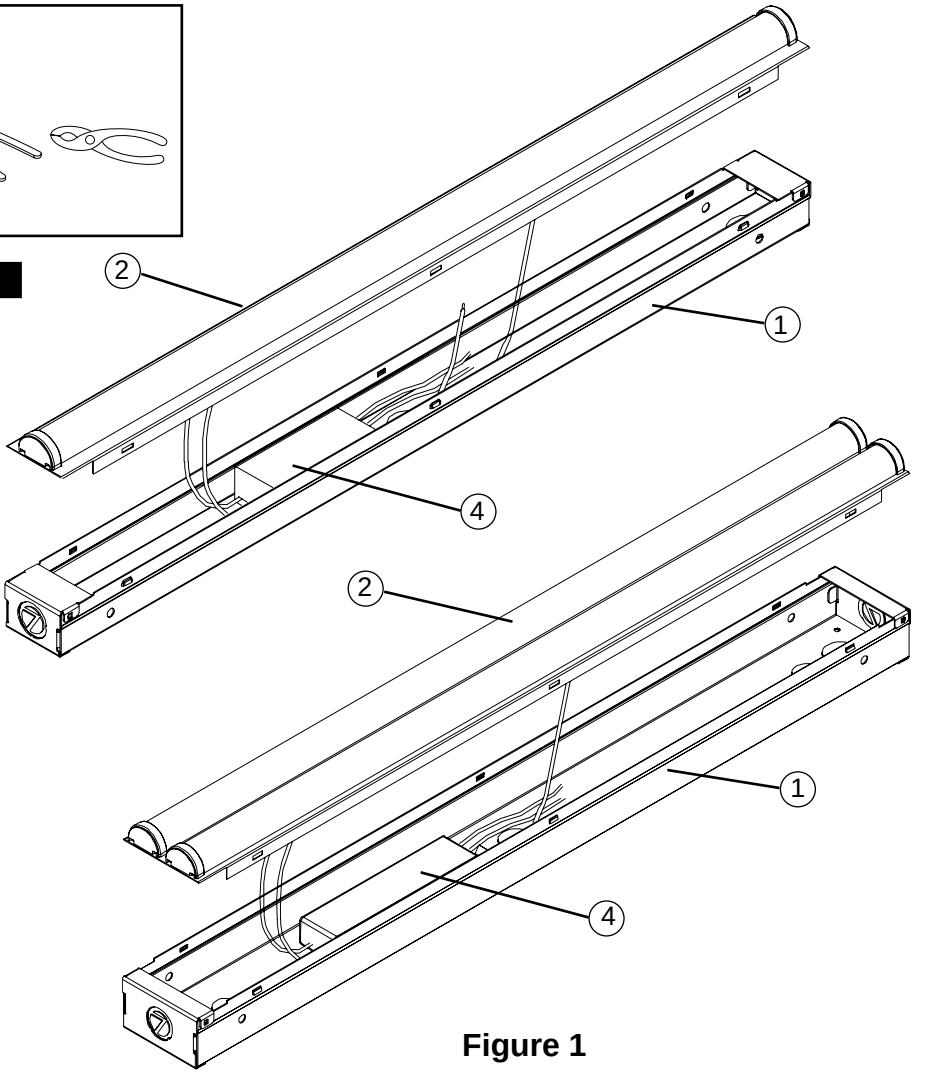


Figure 1

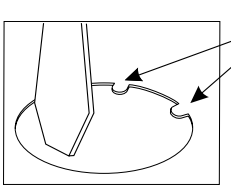


Figure 2

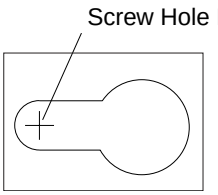


Figure 3

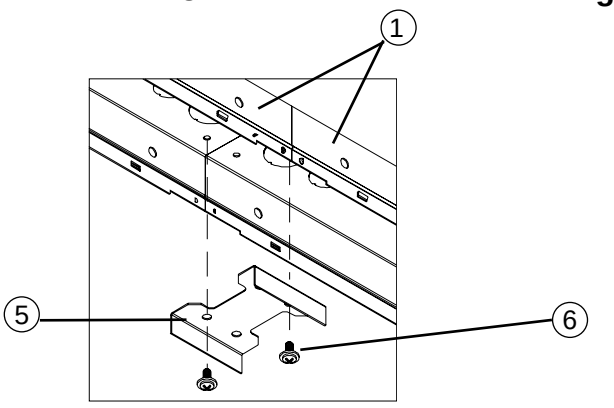


Figure 4

IMPORTANT SAFETY INSTRUCTIONS

- Fixture can NOT be used with a dimmer switch.
- To reduce the risk of death, personal injury or property damage from fire, electric shock, falling parts, cuts/abrasions, and other hazards read all warnings and instructions included with and on the the fixture box and all fixture labels.
- Before installing, servicing, or performing routine maintenance upon this equipment, follow these general precautions.
- Commercial installation, service and maintenance of luminaires should be performed by a qualified licensed electrician.
- For Residental installation: If you are unsure about the installation or maintenance of the luminaires, con-sult a qualified licensed electrician and check your local electrical code.
- DO NOT INSTALL DAMAGED PRODUCT!
- Recycle: For information on how to recycle LED electronic products, please visit www.epa.gov.
- This fixture should not be used in areas with limited ventilation or high ambient temperatures.
- This fixture is intended to be connected to a properly installed and grounded UL listed junction box.
- These instructions do not purport to cover all details or variations in equipment nor to provide every possible contingency to meet in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's or owner's purpose, this matter should be referred to Acuity Brands Lighting, Inc.

WARNING: RISK OF ELECTRICALSHOCK

- Turn off electrical power at fuse or circuit breaker box before wiring fixture to the power supply.
- Turn off the power when you perform any maintenance
- Verify that supply voltage is correct by comparing it with the luminaire label information.
- Make all electrical and grounded connections in accordance with the National Electrical Code and any applicable local code requrirements.
- All wiring connections should be capped with UL approved wire connectors.

CAUTION: RISK OF INJURY

- Wear gloves and safety glasses at all times when removing luminaire from carton,installing, servicing or performing maintenance.
- Avoid direct eye exposure to the light source while it is on.
- Account for small parts and destroy packing material, as these may be hazardous to children.

WARNING: RISK OF BURN

- Allow fixture to cool before handling. Do not touch enclosure or light source.
- Do not exceed maximum wattage marked on lumi-naire label.
- Follow all lamp manufacturer's warnings, recom-mendations and restrictions for: driver type, burning position, mounting locations/methods, replacement, and recycling.
- Use only lamps that comply with ANSI standards.

CAUTION: RISK OF FIRE

- Keep combustible and other materials that can burn away from luminaire and lamp/lens.
- Minimum 90° C supply conductors.

STEP-BY-STEP GUIDE

1. Remove fixture components and parts pack(s). Check that all parts are included. **See Fig. 1.**

Note: Turn off power at circuit breaker box!

2. **Remove Wireway Cover (2) by lifting upward** on exposed edges of part. Start in the middle and work outward.

3. **Determine appropriate knockout** on Housing assembly (1) for removal in relationship to incoming power supply. (Knockouts are located on each end and back of the fixture.)

To remove knockouts:
Place standard screwdriver on edge of circle (on opposite side from retaining tabs) and gently strike with hammer. Grip edge with pliers and flex back and forth until removed. **See Fig. 2.**

4. **If using romex strain relief bushing**, install the bushing into the open hole.

5. **Insert house power supply cable** through open hole or strain relief bushing.

6. **Position the Fixture Housing (1) against** the mounting surface and with a pencil, mark the screw hole locations to be located at the narrow section of the keyholes. **See Fig. 3.**

7. **Using a drill with a 1/16" drill bit**, make two small pilot holes at the marked screw hole locations. If drill bit does not encounter a stud or wood surface, use toggle bolts or suitable fastener depending on structural conditions. If drill bit does encounter wood surface, use #10 wood screw.

8. **Partially install the Mounting Screws.** Position the Fixture Housing against the mounting surface with the screw heads through the keyhole mounting holes. Slide the fixture until the screw heads are through the narrow section of the key holes. Finish tightening the screws to secure the fixture against the mounting surface.

For Continuous Row installation (2LL versions only)

9. **Remove endplate from Housing assembly (1)** to install alignment bracket.

10. **With fixtures installed end to end-** install bracket (5) with two screws (6) provided. One screw per fixture as noted in **Fig. 4.**

WIRING AND FIXTURE OPERATION CAUTION:
Connect fixture to supply wires rated for at least 90°C (194°F).
Do not use fixture on dimming circuits.

11. **Cut supply cable to desired length.** Strip black and white wire leads with wire strippers to expose 3/8"-7/16" of bare metal.

12. **Using Wirenuts (3) provided, connect supply** (house) wires to fixture wires - white to white, black to black, and green to green or bare copper ground wire.

13. **Bundle wires in tight grouping to be** out of the way and reinstall Wireway Cover assembly (2)

Trouble Shooting Guide

If this fixture fails to operate properly, use the guide below to diagnose and correct the problem.

- Verify that fixture is wired properly.
- Verify that fixture is grounded correctly.
- The line voltage at the fixture is correct.

If further assistance is required, contact:
Technical Support at: (800) 315-4963

SECTION 4 - PROCESS EQUIPMENT

SVE REGENERATIVE BLOWER: MAX FLOW 53 ACFM / MAX VACUUM 40" W.C(V) - GAST R3105-1

VAPOR LIQUID SEPARATOR, 16 GALLONS, 2 IN INLET - NES 16 GAL

VACUUM RELIEF VALVE, 1-1/2 IN FNPT, ADJ, SET AT 40 IWC - KUNKLE 215V-H01AQEOOO2

INLINE FILTER, 2 IN, L-STYLE - SOLBERG CSL-851-200HC

DILUTION FILTER SILENCER, 1.5 IN - SOLBERG FS-19P-150

VAPOR PHASE CARBON VESSELS, 200 LB - CFS VS200

GAST

R3 Series
REGENAIR® Regenerative Blowers



Models R3105-1, R3305A-1

Max. pressure – 43 inH_2O (60 Hz), 31 inH_2O (50 Hz)
Max. vacuum – 40 inH_2O (60 Hz), 28 inH_2O (50 Hz)
Max. air flow – 53 CFM (60 Hz), 44 CFM (50 Hz)

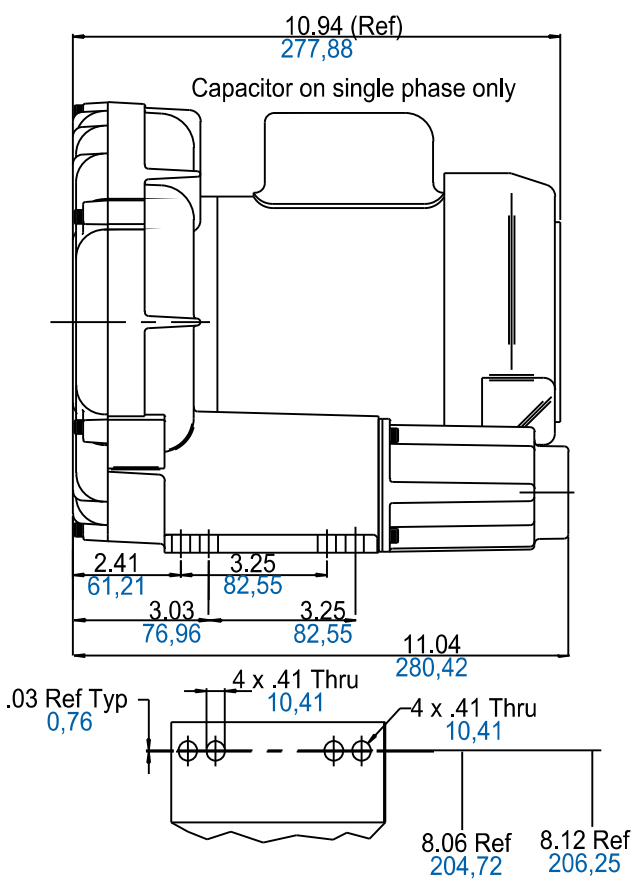
PRODUCT FEATURES

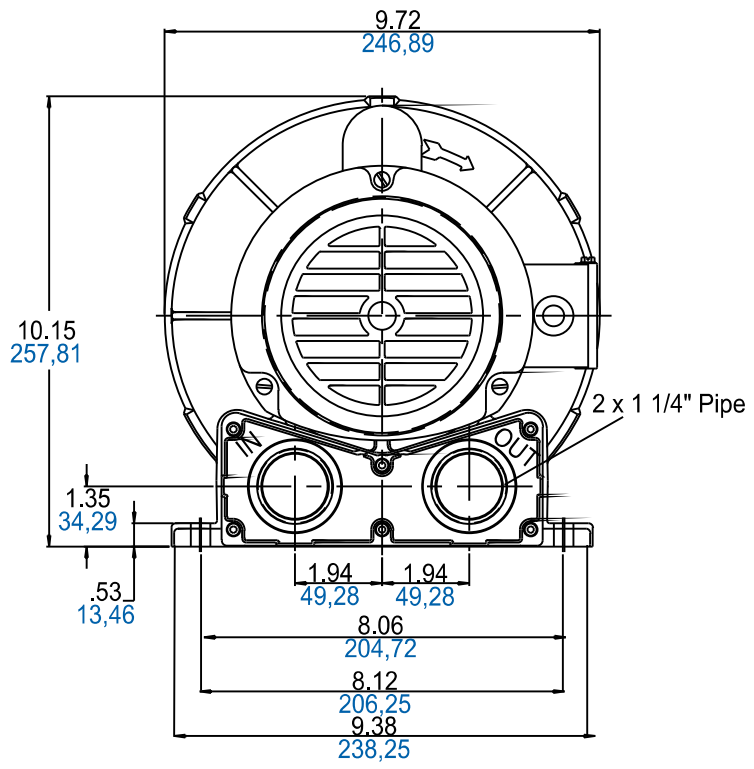
- Rugged construction, low maintenance
- Oilless operation
- UL and CSA approved TEFC motors with permanently sealed ball bearings
- Automatic restart thermal protection on single phase motors
- Aluminum blower housing, impeller, and cover
- Can be operated with no air flow through unit
- Can be mounted in any plane
- Inlet and outlet have internal muffling

RECOMMENDED ACCESSORIES

- Pressure gauge AJ496
- Inlet filter AJ126C (pressure)
- Vacuum gauge AJ497
- Inline filter AJ151C (vacuum)
- Muffler AJ121C
- Foam replacement kit K901

Product Dimensions (inches, mm)

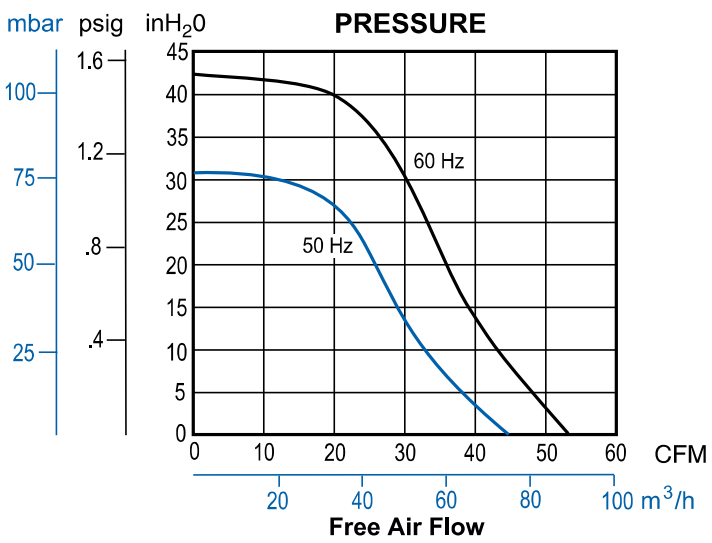


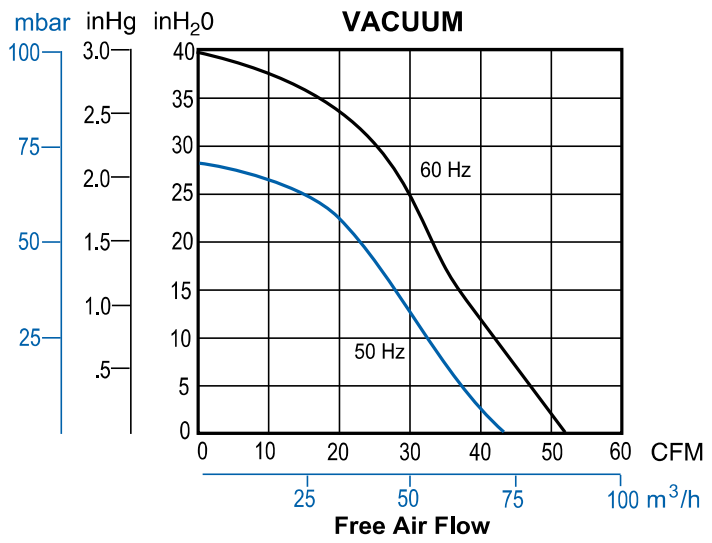


Product Specifications

MODEL NUMBER		R3105-1	R3305A-1
Motor Enclosure		TEFC	TEFC
HP/kW	60 Hz	.50/0,37	.50/0,37
	50 Hz	.33/0,25	.33/0,25
Voltage	60 Hz	115/208-230-1	208-230/460-3
	50 Hz	110/220-240-1	190-220/380-415-3
Amps	60 Hz	5.6/3.0-2.8	2.0-2.0/1.0
	50 Hz	5.2/2.6-3.1	1.6-1.8/.8-.84
Starting Amps	60 Hz	23.2 @ 115V	10.0 @ 230V
	50 Hz	23 @ 220V	7.9 @ 220V
Insulation Class		B	B
Recommended NEMA Starter Size		00/00	00/00
Net Weight (lbs/kg)		29/13,2	29/13,2

Product Performance





STANDARD REGENAIR BLOWER

OPERATION & MAINTENANCE MANUAL



Model R1 Shown



Model R6P350A Shown



Model R7P Shown

Thank you for purchasing this Gast product. It is manufactured to the highest standards using quality materials. Please follow all recommended maintenance, operational and safety instructions and you will receive years of trouble free service.

WARNING



PLEASE READ THIS MANUAL COMPLETELY BEFORE INSTALLING AND USING THIS PRODUCT. SAVE THIS MANUAL FOR FUTURE REFERENCE AND KEEP IN THE VICINITY OF THE PRODUCT.

General information

This manual does not apply to:

- SDR Series blowers without motors
- Blowers powered with Explosion Proof Motors

Product Use Criteria:

- Pump only clean, dry air.
- Operate at -20ºF - 104ºF (-29ºC - 40ºC).
- Protect unit from dirt & moisture.
- Do not pump flammable or explosive gases or use in an atmosphere that contains such gases.
- Protect all surrounding items from exhaust air. This exhaust air can become very hot.
- Corrosive gases and particulate material will damage unit. Water vapor, oil-based contaminants or other liquids must be filtered out.
- The blower must be installed with the properly sized inlet and inline filters, gauges and relief valves to protect the product from dirt and over-heating.
- Consult your Gast Distributor/Representative before using at high altitudes.

GAST®
A Unit of IDEX Corporation

ISO 9001 & 14001 CERTIFIED **www.gastmfg.com**

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Your safety and the safety of others is extremely important.

We have provided many important safety messages in this manual and on your product. Always read and obey all safety messages.

This is the safety alert symbol. This symbol alerts you to hazards that can kill or hurt you and others. The safety alert symbol and the words "DANGER" and "WARNING" will precede all safety messages. These words mean:

DANGER

You will be killed or seriously injured if you don't follow instructions.

WARNING

You can be killed or seriously injured if you don't follow instructions.

All safety messages will identify the hazard, tell you how to reduce the chance of injury, and tell you what can happen if the safety instructions are not followed.

INSTALLATION

WARNING



Electrical Shock Hazard

Disconnect electrical power at the circuit breaker or fuse box before installing this product.

Install this product where it will not come into contact with water or other liquids.

Install this product where it will be weather protected.

Electrically ground this product.

Failure to follow these instructions can result in death, fire or electrical shock.

Correct installation is your responsibility. Make sure you have the proper installation conditions and that installation clearances do not block air flow.

Blocking air flow over the product in any way can cause the product to overheat.

The blower must be installed with the properly sized inlet filter, gauge and relief valve to protect the product from dirt and over-heating.

Mounting

The single impeller blower should be oriented with the shaft in a horizontal position, unless the model's product features state otherwise. The dual impeller models must be mounted with the shaft in a horizontal position. Mounting the product to a stable, rigid operating surface and using shock mounts will reduce noise and vibration.

Rotation

From the motor side of the blower, check that the blower is rotating clockwise. (The motor side is marked with an arrow on most models.) Proper rotation can also be checked by the air flow at the IN and OUT ports. On blowers powered by a 3-phase motor, incorrectly connecting any two power lines can reverse direction.

Plumbing

Remove any foreign material (burrs, chips, welding drops, slag, pipe cuttings, excess sealant, sand or lime) from plumbing.

Check motor mounting and rotation before connecting to plumbing. Inlet and outlet ports are not designed to support plumbing.

Remove plugs from the IN and OUT ports. Use a small amount of pipe thread lubricant when connecting plumbing to protect the aluminum blower threads. Connect with pipe and fittings that are the same size or larger than the product's threaded ports. When installing two blowers in parallel, use plumbing that is two whole pipe sizes larger in diameter than that of the blower. Be sure to connect the intake and exhaust plumbing to the correct inlet and outlet ports.

Plumbing to remove the hot discharge air of larger blowers may be required to help maintain proper room ambient temperature. Use a relief valve to discharge excess air into the atmosphere. If the blower will be operated at 125mbar (50" H_2O) or higher, metal pipe is required for hot exhaust air.

Accessories

Install two vacuum gauges, one before and one after filter, to monitor restriction through filters. As filters become clogged, performance efficiency will be reduced. Filters should be checked periodically and replaced when necessary. See page 7 for installation.

Install a relief valve to avoid changes in pressure or vacuum that can cause overloading of large blowers. Install an intake filter with a relief valve to prevent foreign material from entering blower if blower is used in a vacuum application in a dirty environment. In applications where there is high humidity or liquids being used in the process, install a moisture separator.

See Recommended Accessories on pages 7-9 or consult your Gast Distributor/Representative for additional filter and accessories recommendations. Do Not install check valves that close with a strong spring. The recommended check valves (page 7) provide minimal pressure drop, positive sealing and are resistant to the high discharge temperatures of large blowers.

Motor Installation

It is your responsibility to contact a qualified electrician and assure that the electrical installation is adequate and in conformance with all national and local codes and ordinances.

Select fuses, motor protective switches or thermal protective switches to provide protection. Fuses act as short circuit protection for the motor, not as protection against overload. Incoming line fuses must be able to withstand the motor's starting current. Motor starters with thermal magnetic overload or circuit breakers protect motor from overload or reduced voltage conditions. Motors without automatic restart require thermal protection or magnetic over-current cutout to prevent motor overloading from one phase in a 3-phase circuit, high starting frequency or jammed blower.

The power required will rise as differential pressure increases. The wiring diagram attached to the product or on page 6 of this manual provides required electrical information. Large motors have two diagrams, one for 50Hz wiring specifications and the other for 60Hz wiring specifications. Check that the power source is correct to properly operate the dual-voltage motor. If additional information is required, please consult your Gast Distributor/Representative.

Electrical Connection

WARNING



Electrical Shock Hazard

This product must be properly grounded.

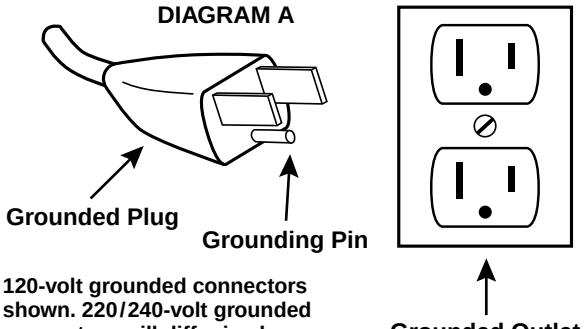
Do not modify the plug provided. If it will not fit the outlet, have the proper outlet installed by a qualified electrician.

If repair or replacement of the cord or plug is necessary, do not connect the grounding wire to either flat blade terminal. The wire with insulation that is green or green with yellow stripes is the grounding wire.

Check the condition of the power supply wiring. Do not permanently connect this product to wiring that is not in good condition or is inadequate for the requirements of this product.

Failure to follow these instructions can result in death, fire or electrical shock.

DIAGRAM A



120-volt grounded connectors shown. 220/240-volt grounded connectors will differ in shape.

Model with a power supply cord:
This product must be grounded. For either 120-volt or 220/240-volt circuits connect power supply cord grounding plug to a matching grounded outlet. **Do not use an adapter.** (See DIAGRAM A)

In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. This product may be equipped with a power supply cord having a grounding wire with an appropriate grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

Check with a qualified electrician or serviceman if the grounding instructions are not completely understood, or if you are not sure whether the product is properly grounded. Do not modify the plug provided. If it will not fit the outlet, have the proper outlet installed by a qualified electrician.

Model that is permanently wired:
This product must be connected to a grounded, metallic, permanent wiring system, or an equipment grounding terminal or lead on the product.

Power supply wiring must conform to all required safety codes and be installed by a qualified person. Check that supply voltage agrees with that listed on product nameplate.

Extension cords:
Use only a 3-wire extension cord that has a 3-blade grounding plug. Connect extension cord plug to a matching 3-slot receptacle. **Do not use an adapter.** Make sure your extension cord is in good condition. Check that the gage wire of the extension cord is the correct size wire to carry the current this product will draw.

An undersized cord is a potential fire hazard, and will cause a drop in line voltage resulting in loss of power causing the product to overheat. The following table indicates the correct size cord for length required and the ampere rating listed on the product nameplate. **If in doubt, use the next heavier gage cord. The smaller the gage number, the heavier the wire gage.**

Minimum gage for extension cords

Amps	Volts	Length of cord in feet								
	120v	25	50	100	150	200	250	300	400	500
	240v	50	100	200	300	400	500	600	800	1000
0-2		18	18	18	16	16	14	14	12	12
2-3		18	18	16	14	14	12	12	10	10
3-4		18	18	16	14	12	12	10	10	8
4-5		18	18	14	12	12	10	10	8	8
5-6		18	16	14	12	10	10	8	8	8
6-8		18	16	12	10	10	8	6	6	6
8-10		18	14	12	10	8	8	6	6	4
10-12		16	14	10	8	8	6	6	4	4
12-14		16	12	10	8	6	6	6	4	2
14-16		16	12	10	8	6	6	4	4	2
16-18		14	12	8	8	6	4	4	2	2
18-20		14	12	8	6	6	4	4	2	2

OPERATION

WARNING

Injury Hazard

Install proper safety guards as needed to prevent any close contact with blower suction area.

Keep fingers and objects away from openings and rotating parts.

Product surfaces become very hot during operation, allow product surfaces to cool before handling.

Air stream from product may contain solid or liquid material that can result in eye or skin damage, wear proper eye protection.

Wear hearing protection. Sound level from some models may exceed 85 dBA.

Failure to follow these instructions can result in burns, eye injury or other serious injury.

It is your responsibility to operate this product at recommended pressures or vacuum duties and room ambient temperatures. Do not operate R4P or larger size blowers without air flowing through the blower. Do not throttle discharge or suction pipe to reducer capacity. Throttle will increase differential pressure causing increasing power absorption and working temperatures.

Start Up

Operate blower for an hour and then check:

1. **Ambient temperature** – Check room and discharge air temperatures. Increased room temperatures may require stronger ventilation especially for larger blowers. Exhaust air should not exceed 215ºF (102ºC) for all blowers less than 3.5 Hp. Exhaust air should not exceed 275ºF (135ºC) for all blowers above 3.5 Hp.
2. **Working pressure and vacuum values** – Adjust relief valve pressure or vacuum setting, if needed.
3. **Motor current** – Check that supply current matches recommended current rating on product nameplate.
4. **Electrical overload cutout** – Check that current matches rating on product nameplate.

If motor fails to start or slows down significantly under load, shut off and disconnect from power supply. Check that the voltage is correct for motor and that motor is turning in the proper direction.

FOR BLOWERS WITH GREASE FITTINGS

Hours of Service Per Year	Relubrication Intervals
5,000	3 years
Continual Normal Service	1 year
Seasonal Service (motor idle for 6 months or more)	1 year at beginning of season
Continuous-high ambients, dirty or moist applications	6 months

Check that all external accessories such as relief valves and gauges are not damaged before re-operating product.

MAINTENANCE

WARNING



Electrical Shock Hazard

Disconnect electrical power supply cord before performing maintenance on this product.

Some motors are thermally protected and will automatically re-start when protector resets.

If product is hard wired into system, disconnect electrical power at the circuit breaker or fuse box before performing maintenance on this product.

Failure to follow these instructions can result in death, fire or electrical shock.

If the product is supplied with an electric power chord, protect it from twisting, cuts and abrasion. When not in use, store in a clean dry place

WARNING

Injury Hazard

Product surfaces become very hot during operation, allow product surfaces to cool before handling.

Air stream from product may contain solid or liquid material that can result in eye or skin damage, wear proper eye protection.

Failure to follow these instructions can result in burns, eye injury or other serious injury.

It is your responsibility to regularly inspect and make necessary repairs to this product in order to maintain proper operation. Make sure that pressure and vacuum is released from product before starting maintenance.

Check filter elements and noise absorbing foam used in mufflers and clean motor and blower after first 500 hours of operation. Replace filter elements and determine how frequently mufflers should be checked during future operation. This one procedure will help assure the product's performance and service life.

When there is an increase in the differential pressure across the inlet filter it is beginning to clog with dirt. Replace the cartridge when the filter will not come clean.

Small motor bearings (less than 5.5 Hp) never need to be greased. Larger motor bearings (greater than 5.5 Hp) have alemite grease fittings. Use a grease gun and apply one or two strokes of Exxon POLYREX® grease to the fittings to lubricate larger motor bearings.

WARRANTY

Gast finished products, when properly installed and operated under normal conditions of use, are warranted by Gast to be free from defects in material and workmanship for a period of twelve (12) months from the date of purchase from Gast or an authorized Gast Representative or Distributor. In order to obtain performance under this warranty, the buyer must promptly (in no event later than thirty (30) days after discovery of the defect) give written notice of the defect to Gast Manufacturing Incorporated, PO Box 97, Benton Harbor Michigan USA 49023-0097 or an authorized Service Center (unless specifically agreed upon in writing signed by both parties or specified in writing as part of a Gast OEM Quotation). Buyer is responsible for freight charges both to and from Gast in all cases.

This warranty does not apply to electric motors, electrical controls, and gasoline engines not supplied by Gast. Gast's warranties also do not extend to any goods or parts which have been subjected to misuse, lack of maintenance, neglect, damage by accident or transit damage.

THIS EXPRESS WARRANTY EXCLUDES ALL OTHER WARRANTIES OR REPRESENTATIONS EXPRESSED OR IMPLIED BY ANY LITERATURE, DATA, OR PERSON. GAST'S MAXIMUM LIABILITY UNDER THIS EXCLUSIVE REMEDY SHALL NEVER EXCEED THE COST OF THE SUBJECT PRODUCT AND GAST RESERVES THE RIGHT, AT ITS SOLE DISCRETION, TO REFUND THE PURCHASE PRICE IN LIEU OF REPAIR OR REPLACEMENT.

GAST WILL NOT BE RESPONSIBLE OR LIABLE FOR INDIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND, however arising, including but not limited to those for use of any products, loss of time, inconvenience, lost profit, labor charges, or other incidental or consequential damages with respect to persons, business, or property, whether as a result of breach of warranty, negligence or otherwise. Notwithstanding any other provision of this warranty, BUYER'S REMEDY AGAINST GAST FOR GOODS SUPPLIED OR FOR NON-DELIVERED GOODS OR FAILURE TO FURNISH GOODS, WHETHER OR NOT BASED ON NEGLIGENCE, STRICT LIABILITY OR BREACH OF EXPRESS OR IMPLIED WARRANTY IS LIMITED SOLELY, AT GAST'S OPTION, TO REPLACEMENT OF OR CURE OF SUCH NONCONFORMING OR NON-DELIVERED GOODS OR RETURN OF THE PURCHASE PRICE FOR SUCH GOODS AND IN NO EVENT SHALL EXCEED THE PRICE OR CHARGE FOR SUCH GOODS. GAST EXPRESSLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE WITH RESPECT TO THE GOODS SOLD. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTIONS SET FORTH IN THIS WARRANTY, notwithstanding any knowledge of Gast regarding the use or uses intended to be made of goods, proposed changes or additions to goods, or any assistance or suggestions that may have been made by Gast personnel.

Unauthorized extensions of warranties by the customer shall remain the customer's responsibility.

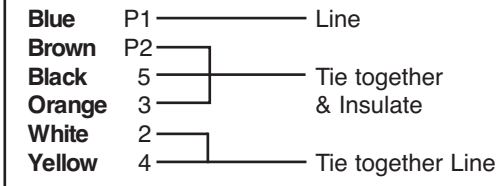
CUSTOMER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF GAST PRODUCTS FOR CUSTOMER'S USE OR RESALE, OR FOR INCORPORATING THEM INTO OBJECTS OR APPLICATIONS WHICH CUSTOMER DESIGNS, ASSEMBLES, CONSTRUCTS OR MANUFACTURES.

This warranty can be modified only by authorized Gast personnel by signing a specific, written description of any modifications.

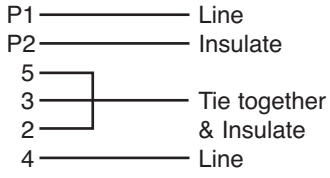
ELECTRICAL WIRING DIAGRAMS

Models
R1102, R2103, R2105, R3105-1, R3105-12, R4110-2

Low Voltage Single Phase

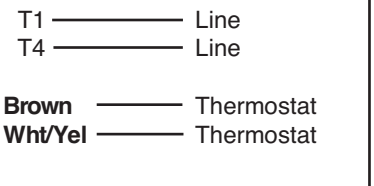


High Voltage Single Phase



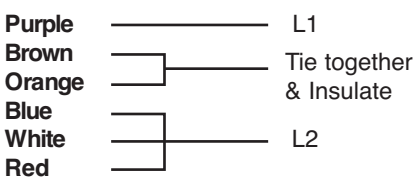
Model
R6150J-2

Low Voltage Single Phase

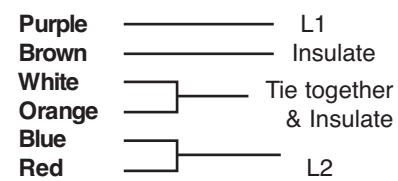


Models
R4P115, R5125-2, R6125-2

Low Voltage Single Phase



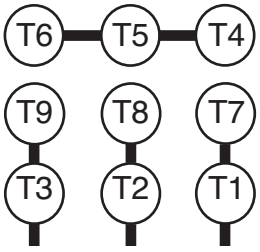
High Voltage Single Phase



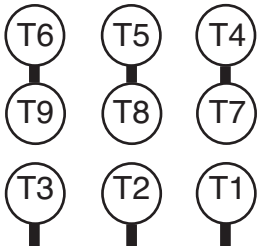
Models
R2303A, R3305A-1, R3305A-13, R4310A-2, R4P315A, R6350A-2, R6P350A, R6PP3110M, R6PS3110M, R7100A-3, R7P3180M, R7S3180M, R93150A

Note: Model R6P355A has two additional leads labeled “J” for an external thermal motor protection circuit.

Connections for 3-Phase, 9 Leads

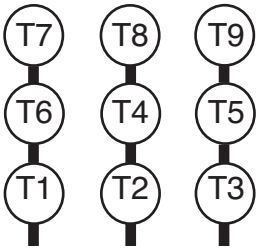


Line
Low Voltage

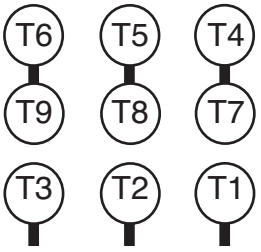


Line
High Voltage

Model R9P3300M, R93150A, R93150A-35

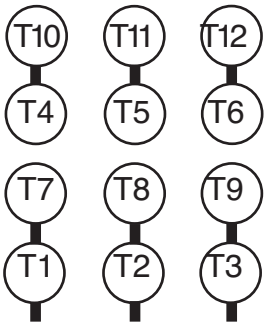


Line
Low Voltage

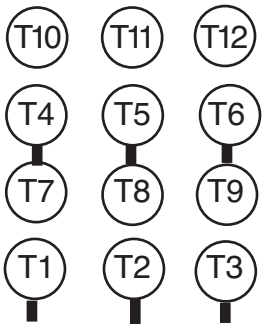


Line
High Voltage

Connections for 3-Phase, 12 Leads
Models R6335A-2, R6P335A

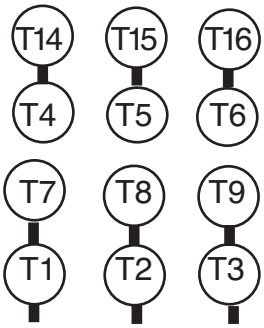


Line
Low Voltage

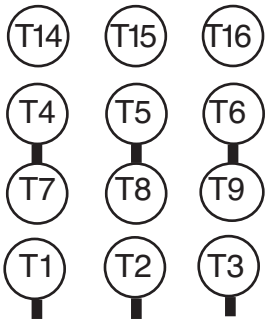


Line
High Voltage

Models R5325A-2, R6325A-2 (BEFORE 1-1-06)

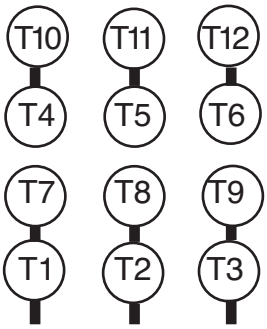


Line
Low Voltage

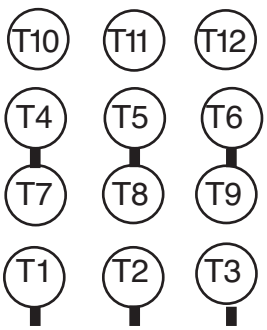


Line
High Voltage

Models R5325A-2, R6325A-2 (AFTER 1-1-06)



Line
Low Voltage



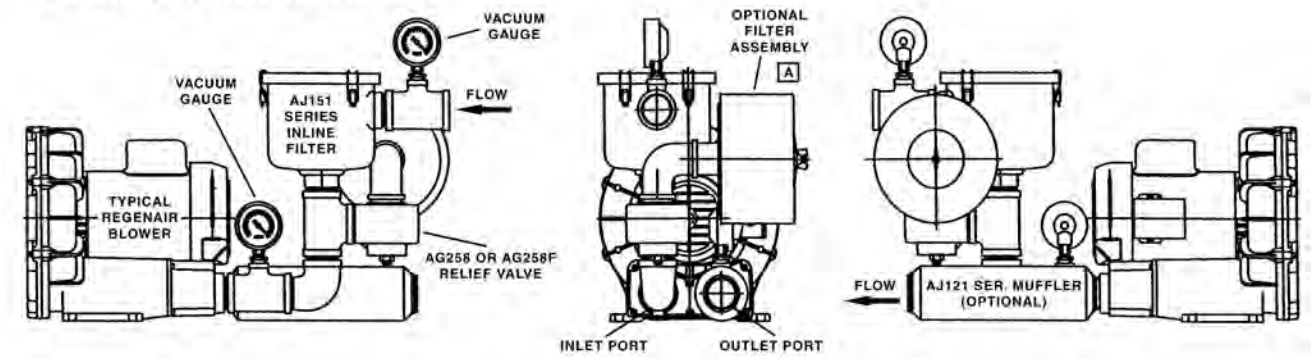
Line
High Voltage

To reverse rotation on any 3-Phase motor, interchange any two external motor line connections to any two line leads.

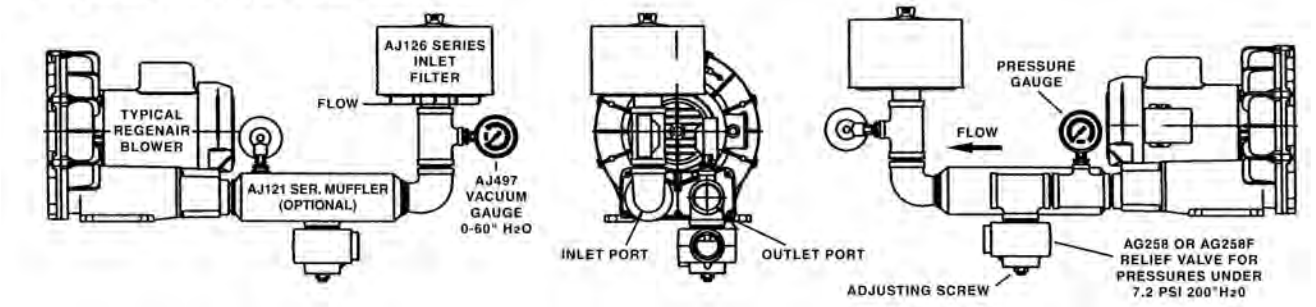
RECOMMENDED ACCESSORIES

The following diagrams are only suggested configurations for these accessories. These accessory configurations may vary depending upon a particular unit's application.

VACUUM ACCESSORIES



PRESSURE ACCESSORIES

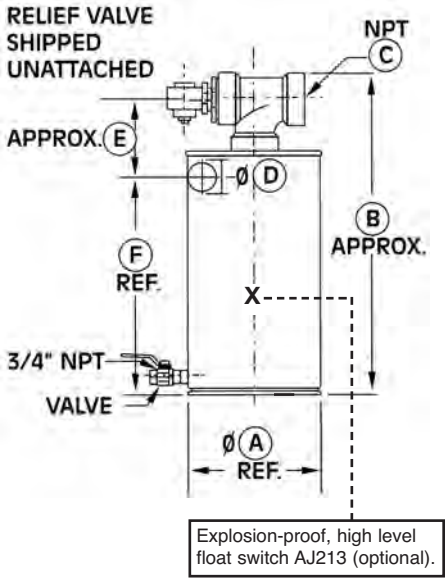


MOISTURE SEPARATOR (FOR VACUUM)

This moisture separator removes liquids from the gas stream in a vacuum process. This helps protect the blower from corrosion and the build up of mineral deposits.

For Model Number	R3, R4, R5	R4, R4H, R4P, R5	R4H, R4M, R5, R6, R6P, R6PS,	R4M, R6, R6P, R6PP, R7, R7P, R7S, R9, R9S
Part Number	**RMS160**	**RMS200**	**RMS300**	**RMS400**
CFM capacity	160	200	300	400
Liquid capacity (gal.)	10	19	19	40
Diameter (A)	14.8"	19.7"	19.7"	24"
Dimension (B)	37.5"	35"	35"	44"
NPT outlet (C)	2"	2"	2.5"	3"
Inlet diameter (D)	2"	2"	2.5"	3"
Dimension (E)	7.5"	7.5"	7.5"	9.7"
Dimension (F)	26.6"	26.6"	26.6"	29"

Maximum vacuum allowed: 22" Hg.

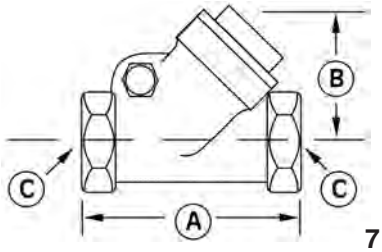


Explosion-proof, high level float switch AJ213 (optional).

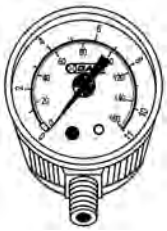
HORIZONTAL SWING TYPE CHECK VALVE

This check valve prevents backwash of fluids from entering the blower and air back-streaming. The check valve can be mounted to discharge or inlet either vertically or horizontally. The check valve will open with 3" of water pressure or vacuum.

Model Number	R1, R2	R3	R4, R5, SDR4, SDR4, R4P	R6, R6P, SDR6P, SDR6, R6PS	R7, R7S
Part Number	**AH326B**	**AH326C**	**AH326D**	**AH326F**	**AH326G**
Dimension (A)	3.57"	4.19"	4.50"	5.25"	8.00"
Dimension (B)	2.32"	2.69"	2.94"	3.82"	5.07"
Dimension (C)	1.00" NPT	1.25" NPT	1.50" NPT	2.00" NPT	2.50" NPT

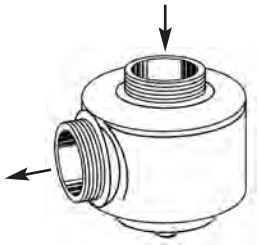


RECOMMENDED ACCESSORIES



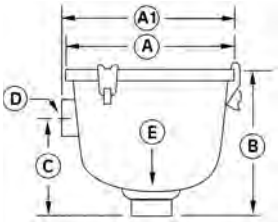
PRESSURE – VACUUM GAUGE

Pressure/Vacuum Gauges				
AJ496	2.50” Dia.	Pressure	1/4” NPT	0-60 in. H_2O and 0-150 mbar
AE133	2.50” Dia.	Pressure	1/4” NPT	0-160 in. H_2O and 0-400 mbar
AE133A	2.50” Dia.	Pressure	1/4” NPT	0-200 in. H_2O
AJ497	2.50” Dia.	Vacuum	1/4” NPT	0-60 in. H_2O and 0-150 mbar
AE134	2.50” Dia.	Vacuum	1/4” NPT	0-160 in. H_2O and 0-400 mbar
AE134F	3.50” Dia.	Vacuum	1/4” NPT	0-15 in. HG



PRESSURE – VACUUM RELIEF VALVE

Pressure/Vacuum Relief Valves		
AG258	1.50” NPT	Adjustable 30-200 in. H_2O; 200 cfm max
AJ121D		Silencer for AG258 Relief Valve
AG258F	2.50” NPT	Adjustable 25-200 in. H_2O; 560 cfm max
AJ121G		Silencer for AG258F Relief Valve



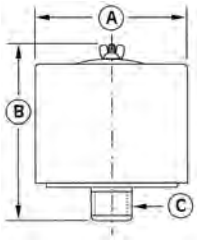
INLINE FILTERS (FOR VACUUM)

The impeller of a blower passes very closely to the housing. It is recommended to have an inlet or in-line filter to ensure a trouble-free service life.

MPT = Male Pipe Thread
FPT = Female Pipe Thread

Model Number	R1	R2	R3	R4	SDR4, R4P, R4H, R5	SDR5, SDR6, R6, R6P, R7M	R6PP, SDR6P, R6PS, R7, R7S	R7S, R9, R9P, R9S
Part Number	**AJ151A**	**AJ151B**	**AJ151C**	**AJ151D**	**AJ151E**	**AJ151G**	**AJ151H**	**AJ151M**
Dimension (A)	5.88”	7.38”	7.38”	7.38	8.75	8.75”	14.00”	18.50”
Dimension (A1)	–	–	–	–	–	–	16.25”	20.75”
Dimension (B)	4.50”	6.81”	6.81”	6.81”	10.25”	10.50”	27.13”	28.13”
Dimension (C)	2.75”	4.62”	4.62”	4.62”	5.00”	5.50”	18.50”	19.50”
Dimension (D)	1.00” FPT	1.00” FPT	1.25” FPT	1.50” FPT	2.00” FPT	2.50” FPT	3”MPT	5” MPT
Dimension (E)	1.00” FPT	1.00” FPT	1.25” FPT	1.50” FPT	2.00” FPT	2.50” FPT	3”MPT	5” MPT
Replacement Element	AJ135D	AJ135E	AJ135E	AJ135E	AJ135F	AJ135G	AJ135C	AJ135H
Micron	10	10	10	10	10	10	10	10

RECOMMENDED ACCESSORIES

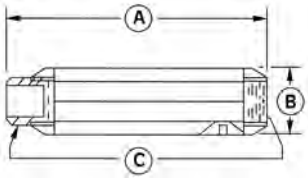


INLET FILTERS (FOR PRESSURE)

All filters are heavy duty for high-particulate service. Inlet filters for Regenair blowers are drip-proof when mounted as shown..

MPT = Male Pipe Thread
FPT = Female Pipe Thread

Model Number	R1, R2	R3	R4, R4H, R4P SDR4, R5	SDR5, R6, SDR6, R5P, R6PP, R6PS	SDR6P, R7, R7P, R7S	R9, R9P, R9S
Part Number	**AJ126B**	**AJ126C**	**AJ126D**	**AJ126F**	**AJ126G**	**AJ126M**
Dimension (A)	6.00”	6.00”	7.70”	10.62”	10.00”	16.00”
Dimension (B)	4.62”	7.12”	7.12”	4.81”	13.12”	14.62”
Dimension (C)	1.00” MPT	1.25” MPT	1.50” MPT	2.00” FPT	2.50” MPT	5” MPT
Replacement Element	AJ134B	AJ134C	AJ134E	AG340	AJ135A	AJ135H
Micron	10	10	10	10	10	10



MUFFLERS

Designed to reduce noise by up to 5 dbA and remove high-frequency sound associated with all blowers.

Model Number	R1, R2	R3	R4, SDR4, R4P, R5	R4H, R6, R6P, R6PS SDR6P, SDR6	R7, R7S	R6PP, R9 Exhaust	R7P Exhaust
Part Number	**AJ121B**	**AJ121C**	**AJ121D**	**AJ121F**	**AJ121G**	**AJ121H**	**AJ121M**
Dimension (A)	7.46”	7.94”	12.75”	17.05”	17.44”	20.30”	33.60”
Dimension (B)	2.38”	2.62”	3.25”	3.63”	4.25”	4.75”	6.00”
Dimension (C)	1.00” NPT	1.25” NPT	1.50” NPT	2.00” NPT	2.50” NPT	3” NPT	4”NPT

PARTS & ORDERING INFORMATION

Please reference the exploded view on Page 11 for the following model and parts table.

REF#	ITEM	QTY	R1102 R1102C R1102K	R2103 R2303A	R2105	R2305B	R3105-1 R3305A-1 R3305B-1
1	COVER	1	AJ101A	AJ101B	AJ101B	AJ101B	AJ101C
2	LOCK NUT	1	BC187	BC187	BC181	BC181	BC181
3	IMPELLER	1	AJ102A	AJ102BQ	AJ102B	AJ102B	AJ102C
4	SQUARE KEY	1	AH212C	AH212	AB136A	AB136A	AB136A
5	SHIM SPACER	Δ	AE686-5	AE686-3	AJ109	AE686-3	AJ109
6	RETAINING RING	1	AJ145	AJ145	AJ149	AJ145	AJ149
7	HOUSING	1	AJ103A	AJ103BQ	AJ103B	AJ103B	AJ103C
8	–	–	–	-	–	–	–
9	–	–	–	-	–	–	–
10A	FOAM	Δ	AJ112A(4)	AJ112BQ(6)	AJ112BQ(6)	AJ112BQ(6)	AJ112C(4)
10B	FOAM	2	–	–	–	–	AJ112CQ
11	MUFFLER EXTENSION	1	AJ106A	AJ106BQ	AJ106BQ	AJ106BQ	AJ106CQ

Δ As required.
Parts listed are for stock models. For specific OEM models, please consult the factory.
When corresponding or ordering parts, please give complete model and serial numbers.

PARTS & ORDERING INFORMATION

Please reference the exploded view on the next page for the following model and parts tables.

REF#	ITEM	QTY	R3105-12 R3305A-13	R4110-2 R4310A-2 R4310B-1	R4P115 R4P315A†	R5125-2 R5325A-2 R5325B-1	R6125-2 R6150J-2 R6325A-2 R6335A-2 R6335B R6350A-2 R6350B-2	R6P335A R6P350A R6P350B	R6135J-10
1	COVER	1	AJ101C	AJ101D	AJ101L	AJ101EQ	AJ101FB	AJ101K	AJ101FB
2	LOCK NUT	1	BC181	BC181	BC181	AJ259	AJ259	AJ259	AJ259
3	IMPELLER	1	AJ102CA	AJ102D	AJ102L	AJ102E	AJ102FR	AJ102K	AJ102FR
4	SQUARE KEY	1	AB136A	AB136D	AB136D	AB136	AB136	AB136	AB136
5	SHIM SPACER	Δ	AJ109	AJ109	AJ109	AJ109	AJ109	AJ109	AJ260A
5†	SHIM SPACER†	1	–	–	AJ109A†	–	–	–	–
6	RETAINING RING	1	AJ149	AJ149	AJ149	–	–	–	–
7	HOUSING	1	AJ103C	AJ103DR	AJ103L	AJ103EQ	AJ103FQ	AJ103K	AJ103FQ
8	MUFFLER BOX	1	–	–	–	–	–	AJ104K	–
9	SPRING	2	–	AJ113DR	AJ113DQ	AJ113DQ	AJ113FQ	AJ113FQ	AJ113FQ
9A	SCREEN	2	–	–	AJ123EQ	AJ123EQ	AJ123FB	–	AJ123FB
10A	FOAM	Δ	AJ112C(4)	AJ112DS(4)	AJ112ER(6)	AJ112ER(6)	AJ112FC(6)	AJ112K(8)	AJ112FC(6)
10B	FOAM	2	AJ112CQ	AJ112DR	–	–	–	–	–
11	MUFFLER EXTENSION	1	AJ106CQ	AJ106DQ	AJ106EQ	AJ106EQ	AJ106FR	–	AJ106FR

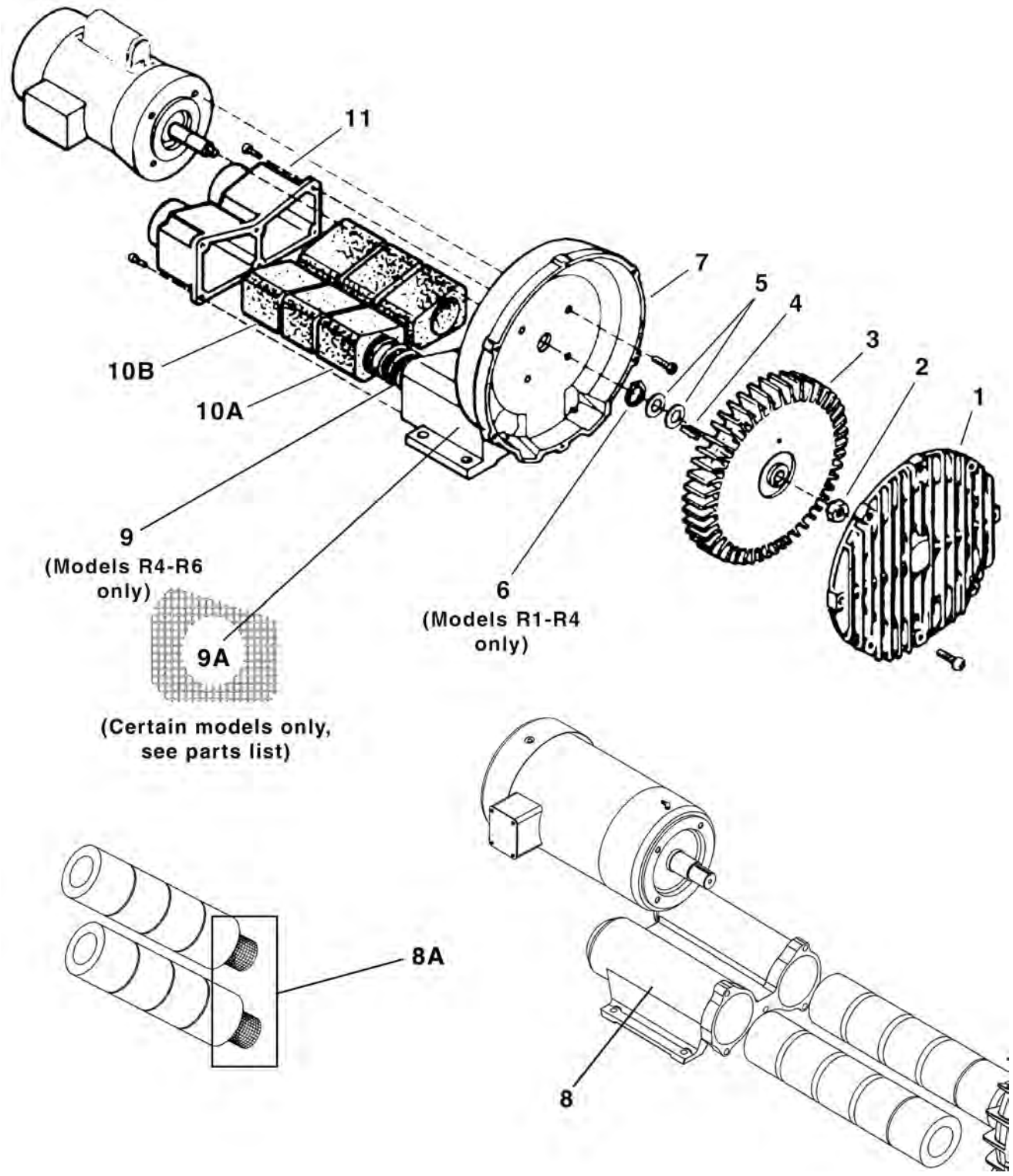
REF#	ITEM	QTY	R6P350A	R6P350B	R6P355A	R6PP3110M*	R6PS3110M*	R7100A-3	R7100B-1
1	COVER	1	AJ101K	AJ101K	AJ101KA	AJ101KA(2)	AJ101KA(2)	AJ101G	AJ101G
2	LOCK NUT/BOLT	1	AJ259	AJ259	BB750	BB750(2)	BB750(2)	BB750	BB750
3	IMPELLER	1	AJ102K	AJ102K	AJ102KA	AJ102KA(2)	AJ102KA(2)	AJ102GZ	AJ102GA
4	SQUARE KEY	1	AB136	AB136	AB136	AB136(2)	AB136(2)	AC628	AC628
5	SHIM SPACER	Δ	AJ109	AJ169F	AJ169F	AJ169F	AJ169F	AJ110	AJ110
6	RETAINING RING	1	–	–	–	–	–	–	–
7	HOUSING	1	AJ103K	AJ103K	AJ103KA	AJ103KD(2)	AJ103KD(2)	AJ103GA	AJ103GA
8	MUFFLER BOX	1	AJ104K	AJ104K	AJ104K	–	–	AJ104GA	AJ104GA
8A	SCREEN	2	–	–	–	–	–	AJ998G	AJ998G
9	SPRING	2	AJ113FQ	AJ113FQ	AJ113FQ	–	–	–	–
10A	FOAM	Δ	AJ112K(8)	AJ112K (8)	AJ112K (8)	–	–	AJ112GA(8)	AJ112GA(8)
10B	FOAM	2	–	–	–	–	–	–	–
11	MUFFLER EXTENSION	1	–	–	–	–	–	–	–
12 **	O-RING	2	–	–	–	AJ175	–	–	
13	GASKET	4	–	–	–	AJ107F	AJ107F	–	–

REF#	ITEM	QTY	R7P3180M*	R7S3180M*	R9P3300M*	R9S3300M*	R93150A
1	COVER	1	AJ101G(2)	AJ101G(2)	AJ101M(2)	AJ101M(2)	AJ101M
2	LOCK NUT/BOLT	1	BB750(2)	BB750(2)	BB707(2)	BB707(2)	BB707
3	IMPELLER	1	AJ102GZ(2)	AJ102GZ(2)	AJ102M(2)	AJ102M(2)	AJ102M
4	SQUARE KEY	1	AC628(2)	AC628(2)	AE130A(2)	AE130A(2)	AE130A
5	SHIM SPACER	Δ	AJ110	AJ110	BJ110	BJ110	BJ110A
6	RETAINING RING	1	–	–	–	–	–
7	HOUSING	1	AJ103GA(2)	AJ103GA(2)	AJ103M(2)	AJ103M(2)	AJ103M
8	MUFFLER BOX	1	–	–	–	–	AJ104MP
8A	SCREEN	2	–	–	–	–	AJ998M
9	SPRING	2	–	–	–	–	–
10A	FOAM	Δ	–	–	–	–	AJ112M(10)
10B	FOAM	2	–	–	–	–	–
11	MUFFLER EXTENSION	1	–	–	–	–	–
12 **	O-RING	2	AJ175G	–	AJ175G	–	–

† R4P315A only.
* Dual models.
** Not shown.
Δ As required.

Parts listed are for stock models. For specific OEM models, please consult the factory.
When corresponding or ordering parts, please give complete model and serial numbers.

EXPLODED PRODUCT VIEW



TROUBLESHOOTING CHART

Problem	Reason	Remedy
Increased sound.	Noise absorbing foam is damaged. Impeller rubbing inside.	Replace foam. Send unit to a Gast Authorized Service Facility.
Excessive vibration.	Damaged impeller. Motor and/or impeller are dirty.	Replace impeller. Clean motor and impeller periodically.
Ambient and exhaust temperature increases.	Motor and/or blower are dirty. Filters dirty.	Clean motor and blower periodically. Replace filters.
Decreased inlet air pressure	Inlet air filter is clogged.	Clean inlet filter. Replace cartridge.
Unit is very hot.	Wrong wiring. Low voltage. Inlet air filter is clogged. Motor and/or blower are dirty. Operating at too high a pressure or vacuum.	Check wiring. Supply proper voltage. Clean inlet filter. Replace cartridge. Clean motor and blower periodically. Install a relief valve and pressure or vacuum gauge.
Unusual sound.	Impeller is damaged or dirty. Bearing going bad.	Clean or replace impeller. Send unit to a Gast Authorized Service Facility.
Motor overload	Low voltage.	Check power source. Check wire size and wire connections.
Unit does not start.	Incorrect electrical connection or power source. Impeller is damaged.	Check wiring diagram, circuit fusing and circuit capacity. Clean or replace impeller. Install proper filtration.

We have Gast Certified Service Centers throughout the world. For the most up-to-date listing, contact one of our sales offices below:

Gast Manufacturing, Inc.
P.O. Box 97
2300 S. Highway M139
Benton Harbor, MI 49023-0097
Ph: 269/926-6171
FAX: 269/925-8288
www.gastmfg.com

Gast Hong Kong
Room 6,9/F
New Commerce Centre
19 on Sum Street, Shatin
N. T. Hong Kong
Ph: (852) 2690 1066
Fax: (852) 2690 1012
www.gasthk.com

Gast Group Limited, United Kingdom
Unit 11, The I O Centre
Nash Road
Redditch, B98 7AS
United Kingdom
ph: +44 (0) 1527 504040
Fax: +44 (0) 1527 525262
www.gastmfg.com

GAST
A Unit of IDEX Corporation

ISO 9001 & 14001 CERTIFIED **www.gastmfg.com**

Drum Style Moisture Separator



Construction Features

* 15 gallon total capacity
* Carbon Steel construction, exterior primed & painted
* 2" MNPT Tangential Inlet - Vapor
* 3" FNPT Outlet - Vapor

1/2" Ball drain valve

National Environmental Systems
Phone 508-226-1100 Fax 508-226)-1180 84 Dunham Street Attleboro, MA 02703 www.nes-inc.com

KUNKLE MODELS 215V/337 VACUUM RELIEF AND SAFETY VALVES

SAFETY AND RELIEF PRODUCTS

Cast iron non-code vacuum relief and ASME Section VIII air/gas, 'UV',
National Board certified safety valves, both PED certified for non-hazardous gas



MODEL 215V



MODEL 337

FEATURES

- Large nozzle design provides high capacity.
- Flat bronze valve seats are lapped for optimum performance.
- Warn ring offers easy adjustability for precise opening with minimum pre-open or simmer.
- Pivot between disc and spring corrects misalignment and compensates for spring side thrust.
- Model 215V has seal cap for vacuum service.
- Model 337 has 'lift-pin' lift device for easy manual testing.
- Bronze nozzle and disc as standard. Optional SS trim available.
- Each valve tested and inspected for pressure setting and leakage.

NOTES

1. ASME valves made from cast iron; A126 may not be used for lethal or flammable service.
2. Model 215V valves are not suitable for positive pressure.

GENERAL APPLICATION

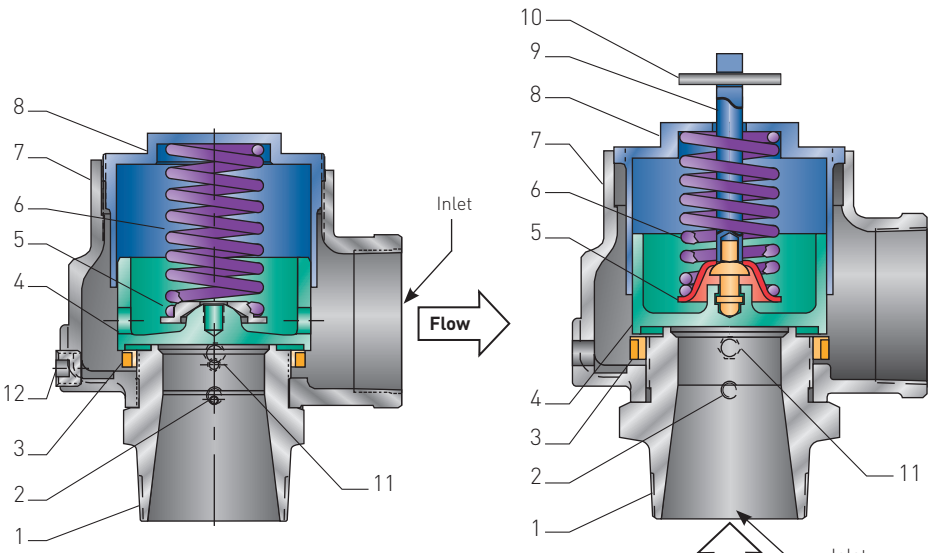
Model 215V is suitable for the protection of high volume vacuum pumps, conveying systems and light gauge tanks. Model 337 for the protection of low to medium pressure high volume blowers, compressors, conveying systems and bulk hauling trailers/equipment.

TECHNICAL DATA

Connections:	Threaded NPT or BSPT
Temperature range:	-20° to 406°F (-29° to 208°C)
Vacuum range (Type 215V):	2" to 29" Hg (67.7 to 982 mbarg)
Pressure range (Type 337):	1 to 60 psig (0.07 to 4.1 barg)
Codes	
Type 215V:	PED CE
Type 337:	ASME VIII and PED ASME UV CE

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PARTS AND MATERIALS



MODEL 215V MODEL 337

MODELS 215V AND 337

No.	Part name	215V	337
1	Nozzle[1]	Bronze, SB62 or brass B283-C48500	Bronze, SB62 or brass B283-C48500
2	Set screw	Steel A108-1018 brass plated	Steel A108-1018 brass plated
3	Regulator ring	Bronze B584 alloy 84400	Bronze B584-C84400
4	Disc[1]	Bronze B584 alloy 84400	Bronze B584-C84400
5	Spring step	Steel A-109 coated[3]	Steel A109 coated[3]
6	Spring	SS, A313 TY 302 or 17-7	SS, A313 TY 302 or 17-7
7	Body	Cast iron A-126, CL A or B	Iron A-126, CL A or B
8	Compression screw	Bronze, B-584 alloy 84400	Bronze, B584-C84400
9	Stem[2]	N/A	Brass B16
10	Lift pin[2]	N/A	Steel, zinc plated
11	Regulator ring set screw	N/A	Brass B16
12	NPT drainplug	Steel A108-1018	N/A

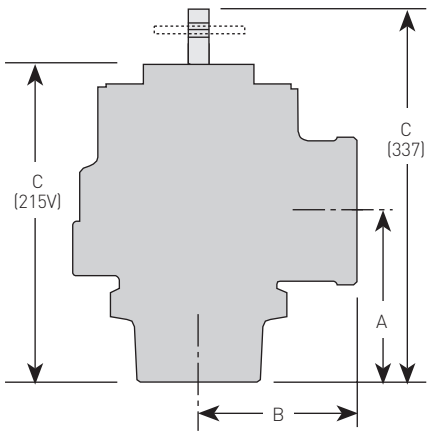
NOTES

1. Disc and nozzle available in SSA-479 TY 316.
2. Stem and lift pin available on Model 337 only.
3. Corrosion preventative coating.

SPECIFICATIONS

Size inlet and outlet	Dimensions, in inch (mm)				
NPS (DN)	A	B	C 215V	C 337	Weight lb (kg)
2 (50.8)	3 ¼ (82.5)	3 (76.2)	6 ½ (165.1)	7 (177.8)	8 (3.6)
2½ (63.5)	3 ¾ (95.2)	3 ½ (88.9)	7 ⅝ (194.6)	8 (203.2)	12 (5.4)
3 (76.2)	4 ¼ (107.9)	4 (101.6)	8 ½ (215.9)	9 (228.6)	20 (9.07)

Dimensions are for reference only.



MODEL 337

CAPACITIES

MODEL 337, non-code[1] and ASME section VIII air (SCFM), flow coefficient = 0.860

	Valve inlet and outlet size		
	2"	2½"	3"
Set pressure	Orifice area, in²		
(psig)	1.916	2.786	4.037
1	250	364	527
5	553	805	1166
10	773	1124	1628
15	988	1436	2081
20	1139	1656	2399
25	1290	1875	2718
30	1441	2095	3036
35	1607	2337	3386
40	1773	2578	3736
45	1939	2820	4086
50	2105	3061	4436
55	2271	3303	4786
60	2438	3544	5136

NOTE

1. No code stamp or 'NB' on nameplate below 15 psig set.

MODEL 337, non-code[1] and ASME section VIII air (Nm³/h), flow coefficient = 0.860 - metric units

	Valve inlet and outlet size		
	50 mm	63 mm	80 mm
Set pressure	Orifice area		
(barg)	(12.361 cm²)	(17.974 cm²)	(26.045 cm²)
0.5	1056	1536	2226
1.0	1468	2135	3094
1.5	1901	2765	4006
2.0	2251	3273	4743
2.5	2631	3825	5543
3.0	3015	4385	6553
3.5	3400	4944	7164
4.0	3784	5503	7974

NOTE

1. No code stamp or 'NB' on nameplate below 1.1 barg set.

MODEL 215V, non-code vacuum air (SCFM), flow coefficient = 0.860

	Valve inlet and outlet size		
	2"	2 ½"	3"
Relief set	Orifice area, in²		
(in, HG)	1.916	2.786	4.037
2	239	347	503
5	352	512	742
10	433	630	912
15	444	646	936
20	444	646	936
29	444	646	936

NOTE

1. Based on 10% accumulation.

MODEL 215V, non-code vacuum air (Nm³/h), flow coefficient = 0.860 - metric units

	Valve inlet and outlet size		
	50 mm	63 mm	80 mm
Relief set	Orifice area		
(mbarg)	(12.361 cm²)	(17.974 cm²)	(26.045 cm²)
50	330	481	696
100	453	658	954
150	536	779	1129
200	597	868	1257
250	641	933	1351
300	673	979	1419
350	694	1010	1463
400	705	1026	1486
450	708	1030	1492
500	713	1037	1503
550	713	1037	1503
600	713	1037	1503
650	713	1037	1503
700	713	1037	1503
750	713	1037	1503

NOTE

1. Based on 10% accumulation.

SELECTION GUIDE

Example:	215V	-	H	01	A	Q	E	0015

Model

215V

0337

Inlet size

H	2" (50.8 mm)
J	2½" (63.5 mm)
K	3" (76.2 mm)

Variation

01	Bronze disc and nozzle
03	SS disc and nozzle
60	BSPT connections
63	SS disc and nozzle with BSPT connections

Design revision

Indicates non-interchangeable revision
Current design is at revision 'A'

Valve service

K	Air ASME section VIII (model 337 only)
Q	Vacuum (model 215V only)
N	Non-code air/gas (model 337 only)

Spring material

215V:

E	SST type 302 or type 17-7

337:

E	SST type 302 (H-orifice up to 8 psi; J-orifice up to 20 psi; K-orifice up to 25 psi)
M	SST type 17-7 (H-orifice above 8 psi; J-orifice above 20 psi; K-orifice above 25 psi)

Set pressure

337	1 psig (0.7 barg) (0001) to 60 psig (4.1 barg) (0060)
215V	2" Hg (68 mbarg) (0002) to 29" Hg (982 mbarg) (0029) vacuum

2"

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SOLBERG
Filtration & Separation

“L” Style Compact Vacuum Filters

CSL Series 3/8” - 3”

Benefits

- Large dirt holding capacity and easy field cleaning, especially when mounted horizontally or inverted
- Low pressure design

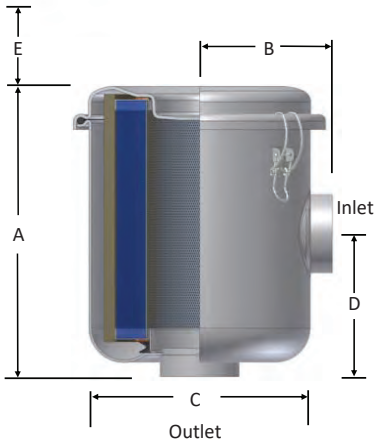


Features

- Seamless drawn housings
- O-ring seal
- Corrosion resistant carbon steel construction
- Powder coat finish
- Stainless steel torsion clips for durability

Technical Specifications

- Vacuum Rating: Medium vacuum service*
- Temp (continuous): min -15°F (-26°C) max 220°F (104°C)
- Filter change out differential: 15-20" H_2O over initial ΔP
- Polyester: 99%+ removal efficiency standard to 5 micron
- Paper: 99%+ removal efficiency standard to 2 micron



Options

ATEX Available

- Vacuum gauge
- Higher holding capacity configurations available (select models)
- Material/Finishes: stainless steel, epoxy coating
- Support brackets
- Alternative top-to-canister fastening system for low pressure or pulsating systems
- Stainless steel (select models)

Inlet/Outlet Size	Inlet/Outlet Type	Assembly SCFM Rating	Assembly Part Number Polyester	Assembly Part Number Paper	Dimensions - inches A	B	C	D	Suggested Service HT. E	Approx. Weight lbs	Replacement Element Part No. Polyester	Replacement Element Part No. Paper	Element SCFM Rating
3/8”	BSPP	18	CSL-825-039HCB	CSL-824-039HCB	3 1/8	2 1/8	3 3/4	1 13/16	3	0.88	825	824	25
1/2”	NPSC	18	CSL-825-050HCB	CSL-824-050HCB	3 1/2	2 1/4	3 3/4	2	3	0.88	825	824	25
1/2”	NPSC	20	CSL-843-050HC	CSL-842-050HC	4	3	5 3/4	2 1/2	3	3	843	842	55
3/4”	NPSC	24	CSL-825-075HCB	CSL-824-075HCB	3 1/2	2 5/16	3 3/4	2	3	0.88	825	824	25
3/4”	NPSC	25	CSL-843-075HC	CSL-842-075HC	4	3	5 3/4	2 1/2	3	3	843	842	55
1”	NPSC	35	CSL-843-100HC	CSL-842-100HC	4 1/4	3 1/4	5 3/4	2 5/8	3	3	843	842	55
1”	NPSC	40	CSL-849-100HC	CSL-848-100HC	6 11/16	4 1/8	7 3/8	4 1/2	5	5	849	848	115
1 1/4”	NPSC	55	CSL-843-125HC	CSL-842-125HC	4 1/4	3 1/4	5 3/4	2 5/8	3	3	843	842	55
1 1/4”	NPSC	60	CSL-849-125HC	CSL-848-125HC	6 11/16	4 1/8	7 3/8	4 1/2	5	5	849	848	115
1 1/2”	NPSC	80	CSL-849-150HC	CSL-848-150HC	6 3/4	4 1/8	7 3/8	4 1/2	5	5	849	848	115
2”	NPSC	175	CSL-851-200HC	CSL-850-200HC	10 1/4	4 1/2	8 3/4	5	9	15	851	850	290
2 1/2”	FPT	210	CSL-851-250HC	CSL-850-250HC	10 11/16	5 1/8	8 3/4	5 1/2	9	15	851	850	290
3”	FPT	300	CSL-239-300C	CSL-238-300C	15 3/4	8 13/16	13 1/4	8 11/16	11	33	239	238	570

*See Vacuum Filter Technical Data for Vacuum Service Data.

Rev: CSL-US1808K

Sales/Service: 630.773.1363
sales@solbergmfg.com

www.solbergmfg.com

All model offerings and design parameters are subject to change without prior notice.
Contact your representative or Solberg for the most current information.

SOLBERG



Inlet Vacuum Filters
Maintenance Manual

www.solbergmfg.com

Solberg Manufacturing, Inc., 1151 Ardmore Itasca, IL 60143 USA
Ph: 630.773.1363 Fax: 630.773.0727 Email: sales@solbergmfg.com Web: www.solbergmfg.com
Rev: MMVF-910

Note: Please read the maintenance instructions given by the OEM for the machinery first. The OEM's manual should be adhered to in order to protect the equipment. Solberg Manufacturing, Inc has made every effort to make sure that these instructions are accurate but is not responsible for any typos, slight variations or for human errors that may occur.

Maintenance Manual

SOLBERG Inlet Vacuum Filters

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**For Further Information Please Call: 630-773-1363*

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Rev: MMVF-910

Section A

INTRODUCTION

The purpose of this manual is instruction on the proper assembly and care of Solberg inlet vacuum filters.

WARNING

This manual must be read and thoroughly understood before using and caring for this air filter. Failure to comply could result in explosion, product/system contamination or personal injury.

This manual should be used as a supplement to the user's understanding of the proper care needed to maintain a safe and dependable air filter. It is the responsibility of the user to interpret and explain all instructions to persons who do not read or understand English BEFORE they are allowed to maintain and use this filter.

This manual should be readily available to all operators responsible for operation and maintenance of the vacuum inlet filters.

We thank you for selecting products from Solberg Manufacturing, Inc. We are confident that our superior filter designs will exceed your application requirements.

Section B

GENERAL INFORMATION

1. Identification of Solberg Vacuum Inlet Filters.

All Solberg inlet vacuum air filters should have an identification label/nameplate that gives the following information:

Assembly Model #
Replacement Element #

(The exception is OEM supplied units. In this case please enter the OEM part numbers below.)

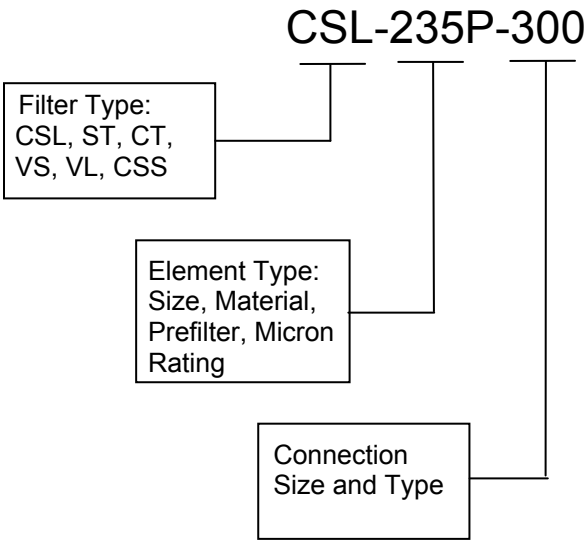
Solberg Manufacturing, Inc., 1151 Ardmore Itasca, IL 60143 USA
Ph: 630.773.1363 Fax: 630.773.0727 Email: sales@solbergmfg.com Web: www.solbergmfg.com

Fill in the actual nameplate data from your new Solberg inlet filter(s):

No.	Filter Model Number	Replacement Element
1		
2		
3		
4		
5		

Table 1

The model number designates the filter type, the original element configuration and housing connection size. For example, the following part number identifies the filter as being a 'CSL' design filter with a 235 element with prefilter and 3" MPT connection size:



2. Filtration Rules of Thumb

General: For peak output performance from a compressor, blower, vacuum pump, engine, or any other machine that consumes air, one must have clean, unrestricted air. Proper filtration can help stabilize the working environment within rotating equipment even when the external conditions may be quite severe. A critical component in creating the right working conditions is filter sizing. With the properly sized filter, equipment will run smoothly over its entire expected operating life.

A major factor in filtration and filter sizing is air velocity through the filter media. Generally, the slower the velocity of air through a media the higher the filter efficiency and, conversely, the lower the pressure drop. Therefore, the primary

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goal in filter sizing is to optimize the velocity of air through the media (sometimes called face velocity).

Rule of Thumb #1: Always begin with the filter cartridge requirements when sizing a filter. Once the appropriate element has been selected then move on to the housing requirements.

Rule of Thumb #2: Always ask or specify a filter based on a micron rating **with** filtration efficiencies. As an example, stating a requirement for a 1-micron filter is misleading because no efficiency rating has been specified. A 1-micron filter at 95-% efficiency may be less efficient than a 5-micron filter at 99% efficiency. For proper air system performance in light and industrial duty environments, a filter with a minimum of 99% filtration efficiency at 5 microns is required.

Rule of Thumb #3: Size your filter correctly by understanding the impact air velocity through a media has on efficiency and pressure drop. Maintain the suggested Air-to-Media ratios listed below based on the external environment listings and Filtration efficiency needs.

Filtration Efficiency Requirements (99+% efficiency)	**Environmental Conditions**	**Air to Media Ratio**	
Industrial Grade 2-micron **Paper**	Industrial Duty (clean, office/warehouse-like)	30 CFM/ft^2	$(51m^3/h)/cm^2$
	Severe Duty (workshop, factory-like)	15 CFM/ft^2	$(25.5m^3/h)/cm^2$
	Extreme Duty (Foundry, Construction-like)	10 CFM/ft^2	$(17m^3/h)/cm^2$
Industrial Grade 5-micron **Polyester**	Industrial Duty (clean, office/warehouse-like)	50 CFM/ft^2	$(85m^3/h)/cm^2$
	Severe Duty (workshop, factory-like)	40 CFM/ft^2	$(68m^3/h)/cm^2$
	Extreme Duty (Foundry, Construction-like)	25 CFM/ft^2	$(42.5m^3/h)/cm^2$
Industrial Grade 1-micron **Polyester**	Severe Duty (Foundry, Construction-like)	10 CFM/ft^2	$(17m^3/h)/cm^2$
Industrial Grade 0.3-micron **HEPA** Glass @ 99.97% efficiency	Industrial Duty (clean office/warehouse-like)	10 CFM/ft^2	$(17m^3/h)/cm^2$
	Severe Duty (workshop, factory-like)	7 CFM/ft^2	$(12m^3/h)/cm^2$
	Extreme Duty (Foundry, Construction-like)	5 CFM/ft^2	$(8.5m^3/h)/cm^2$

Table 2

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Rule of Thumb #4: Pressure drop is also caused by the dirt holding capacity of the element. As the element fills up with dirt, the pressure drop increases. It is important to document the pressure drop across a given filter when it is new and then clean or replace it when the pressure drop increases by 10" to 15" / 250-380mm H_2O from the original reading.

Rule of Thumb #5: The inlet connection greatly influences the overall pressure drop of the filter system. To minimize the restriction contributed by an inlet filter, a velocity of 6,000 ft/min (10200m^3/h) or less is suggested through the outlet pipe. The table below lists the suggested flows based on pipe size:

Pipe Size (inches)	Max Airflow		Pipe Size (inches)	Max Airflow		Pipe Size (inches)	Airflow	
1/4"	6 CFM	10m^3/h	1 ¼"	60 CFM	102m^3/h	6"	1,100 CFM	1870m^3/h
3/8"	8 CFM	14m^3/h	1 ½"	80 CFM	136m^3/h	8"	1,800 CFM	3060m^3/h
1/2"	10 CFM	17m^3/h	2"	135 CFM	230m^3/h	10"	3,300 CFM	5610m^3/h
3/4"	20 CFM	34m^3/h	2 ½"	195 CFM	332m^3/h	12"	4,700 CFM	7990m^3/h
1"	35 CFM	60m^3/h	3"	300 CFM	510m^3/h	14"	6,000 CFM	10200m^3/h
			4"	520 CFM	884m^3/h			
			5"	800 CFM	1360m^3/h			

Table 3 **Note: This information is for general use only. A qualified engineer must properly design each system.*

3. Element Specifications

Temperature Range: -15° to 220°F / -26° to 105°C
Filter Change-Out Differential: 10" to 15" / 250-380mm H_2O Over Initial Delta P

Media	Micron Rating
Standard Paper	99+% @ 2 micron
Standard Polyester	99+% @ 5 micron
"S" Series Wire Mesh	Epoxy Coated Wire Mesh
"Z" Series Polyester	99+% @ 1 micron
"HE" Series HEPA	99.97% @ 0.3 microns
"U" Series Polyester	99+% @ 25 micron
"W" Series Polyester	99+% @ 100 micron
"S2" Series	Stainless Steel Wire Mesh
"AC" & "ACP" Series	N/A
"Y" Series Polypropylene	99+% @ 5 micron

Table 4

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SOLBERG

Temperature Range: -15° to 385°F / -26° to 196°C
Filter Change-Out Differential: 10” to 15” / 250-380mm H_2O Over Initial Delta P

Media	Micron Rating
“MX” & “MXD” Series – Nomex Cloth	99+% @ 5 micron

Table 5

4. **Element Cleaning - Inlet Filtration**

Solberg elements should be cleaned or replaced, once the pressure drop reaches 15 to 20-inches water column (380 - 500mm WC) above the initial pressure drop of the installation.

The decision to clean the element rather than replace it is left to the discretion of the operator. Any damage which results from by-pass or additional pressure drop created by element cleaning is the sole responsibility of the operator.

WARNING

The overall performance of a filter element is altered once cleaned.

The initial pressure drop after cleaning will be greater than the original, clean pressure drop of the element.

After each subsequent cleaning, the initial pressure drop will continue to increase.

Under all circumstances, the initial pressure drop of the element needs to be maintained at less than 20-inches water column (500mm WC).

Cleaned elements that exceed 20-inches water column (500mm WC) at start-up should be replaced with new elements.

With many types of equipment, the maximum pressure drop allowed will be dictated by the ability of the equipment to perform to its rated capacity. Under all

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circumstances, the operator should avoid exceeding the manufacturer's recommended maximum pressure drop for their specific equipment.

A. ***Polyester Element***: The polyester element may be washed in warm soapy water, vacuumed, gently blown out or replaced. The element should be dry before reinstallation. The element should be replaced after a maximum of three cleanings.
B. ***Paper Element***: The paper element may be lightly blown with low pressure air. It is disposable and in most cases should be replaced with a new element.
C. ***Polyurethane Prefilter***: The prefilter may be washed as a sponge or replaced to give the element a longer service life.
D. ***Epoxy Coated Wire Mesh and Stainless Steel Wire Mesh Elements***: Cleaning instructions similar to polyester, except mild solvents may be used.
E. ***Activated Carbon Element***: Not cleanable
F. ***Polypropylene Element***: Cleaning instructions similar to polyester
G. ***Nomex Cloth Element***: Cleaning instructions similar to polyester

If you are not confident that the integrity of the element was maintained during cleaning, it is recommended that a new element be installed. Also, spare parts such as gaskets, wing nuts and washers can be supplied upon request.

Section C

PROCEDURES

1. Installation.

A. Maximum inlet gas stream temperature for most Solberg inlet vacuum filter products is 220°F / 105°C. Temperatures in excess of this could cause damage to elements, media and elastomers.

B. Direction of flow is typically from the outside of the element to the inside of the element. Most products have arrows indicating direction of flow on inlet and outlet ports.

C. Ensure that pipe/flange connections are adequately sealed so the potential for leaks is reduced to a minimum.

2. Disconnecting canister top from canister base.

A. ST/CT/Small CSL: Release wire-form clips or loosen wing nut on "claw" bolts.

B. Large CSL: Loosen wing nut or hex head on T-bolts.

C. CSS: Twist upper housing to release.

D. VS/VL: Remove V-clamp by loosening Hex Nut or T-bolt and releasing.

E. Lift off canister top.

3. Removing element for service/maintenance.

A. Remove retaining hex head/wing-nut and washer carefully, and then remove element. Some elements will have a top plate that should also be removed.

B. Clean sealing surfaces of housing, top & base plates, and element endcaps so that they are free of dirt or any other particulate.

WARNING

Failure to comply with these instructions may result in system or pump contamination.

4. Securing Element.

A. Place new or cleaned element evenly on base plate. Be sure element seats properly on base and there is no dirt or particulate present on sealing surfaces.

B. Place top plate (if necessary) on element by centering on tap bolt.

C. Secure washer and wing nut to end cap (or top plate) and tap bolt. Element must be tightly secured. Note: DO NOT over tighten!

WARNING

Defective installation may cause system or pump contamination. Use only genuine Solberg replacement parts.

5. Securing canister top to canister base.

A. Make sure all surfaces are free from dust and other particulate.

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B. Hemisphere o-ring must rest evenly along canister/casting base o-ring groove.

C. ST/CT/Small CSL: Hold canister housing against o-ring or sealing ring on main filter head. Re-fasten wire-form clips or “claw” bolts.

D. Large CSL: Replace housing top plate. Feed T-bolts into corresponding slots and tighten evenly around perimeter. Note: Do NOT over tighten!

E. VS/VL: Secure V-clamp by disconnecting hex nut or T-bolt portion and placing V-clamp along the diameter of canister o-ring groove. Fasten T-bolt and secure tightly. V-CLAMP LEGS MUST REST UNIFORMLY ALONG ENTIRE O-RING GROOVE.

F. CSS: Reassemble top housing to bottom housing by aligning tabs and turning into place.

Section D

MAINTENANCE RECOMMENDATIONS

1. Pressure drop readings are recommended to have an effective air filter. Always document initial pressure drop during start-up when element is clean. Replacement cartridge is needed when system experiences 10” to 15” / 250-380mm H_2O higher pressure drop above the initial reading. Refer to page 4 for instructions.

2. Always check replacement cartridge gaskets to insure they are adhered uniformly along the end caps during handling. If not, contact Solberg Manufacturing, Inc. immediately. Do not modify or change from Solberg specified parts!

3. Always check inlets/outlets, element base and its components when replacing element to insure cleanliness. Wipe clean if necessary.

4. Operate only when a proper seal exists.

5. VS/VL: Never operate without absolute assurance that V-clamp is secured correctly along entire diameter of canisters. Check along V-clamp for wear. Replace if any distortion occurs due to handling and usage.

SPARE PARTS

Contact your Solberg Representative for spare part model numbers.

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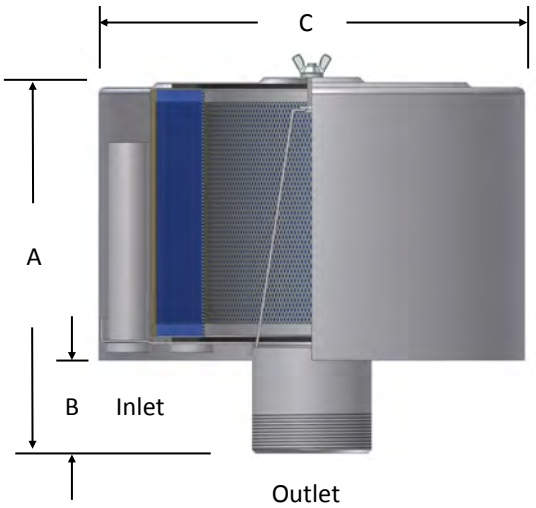
Compact Filter Silencers
FS Series 1/2”-6”MPT, 4”-6”FLG





Features

- Fully drawn weatherhood
- Tubular silencing design - tubes are positioned to maximize attenuation and air flow while minimizing pressure drop
- Corrosion resistant carbon steel construction
- Powder coat finish



Technical Specifications

- Temp (continuous): min -15°F (-26°C) max 220°F (104°C)
- Filter change out differential: 15-20” H2O over initial Δ P
- Pressure drop graphs available upon request
- Polyester: 99%+ removal efficiency standard to 5 micron
- Paper: 99%+ removal efficiency standard to 2 micron

Options

ATEX Available

- Tap holes available
- Pressure drop indicator (See page 3-12)
- Various media for different environments
- Stainless steel construction
- Various nonstandard finishes and connection styles
- Side Access Silencer Filters (LQB Series) for space restricted enclosures (select models)

Tidbit: Charlie Solberg Sr. “Senior” designed our first filter silencer in 1966. The FS-15 size filter was created for small air compressors.

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MPT Outlet Assemblies

MPT Outlet	Assembly SCFM Rating	Assembly Part Number Polyester	Assembly Part Number Paper	Dimensions - inches A	B	C	No. of Silencing Tubes	Approx. Wt. lbs	Replacement Element Part No. Polyester	Replacement Element Part No. Paper	Element SCFM Rating
1/2"	10	FS-15-050	FS-14-050	3 7/16	1	6	1	2	15	14	35
3/4"	25	FS-15-075	FS-14-075	4	1 1/4	6	2	2	15	14	35
1"	35	FS-15-100	FS-14-100	4	1 5/16	6	3	2	15	14	35
1"	55	FS-19P-100	FS-18P-100	6 3/8	1 4/16	6	3	3	19P	18P	100
1 1/4"	70	FS-19P-125	FS-18P-125	6 3/4	1 5/8	6	5	3	19P	18P	100
1 1/2"	85	FS-19P-150	FS-18P-150	6 3/4	1 5/8	6	5	4	19P	18P	100
2"	135	FS-31P-200	FS-30P-200	7 1/2	2 3/8	10	5	8	31P	30P	195
2"	135	FS-231P-200	FS-230P-200	12	2 3/8	10	5	14	231P	230P	300
2 1/2"	195	FS-31P-250	FS-30P-250	7 1/2	2 1/2	10	5	8	31P	30P	195
2 1/2"	195	FS-231P-250	FS-230P-250	12 3/8	2 5/8	10	9	15	231P	230P	300
3"	300	FS-231P-300	FS-230P-300	12 3/4	3 1/8	10 1/4	9	15	231P	230P	300
3"	300	FS(12)-235P-300	FS(12)-234P-300	12 7/8	2 11/16	12 1/4	3	29	235P	234P	570
3"	300	FS-275P-300	FS-274P-300	13	3	16	9	33	275P	274P	1100
4"	520	FS(12)-235P-400	FS(12)-234P-400	13 7/8	3 11/16	12 1/4	6	29	235P	234P	570
4"	520	FS-275P-400	FS-274P-400	14	4	16	9	34	275P	274P	1100
5"	800	FS-245P-500	FS-244P-500	14	4 1/8	16	14	33	245P	244P	880
5"	800	FS-275P-500	FS-274P-500	14	4 1/8	16	14	36	275P	274P	1100
6"	1100	FS-275P-600	FS-274P-600	15	5 1/8	16	18	38	275P	274P	1100

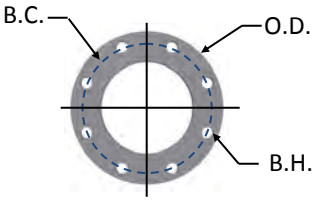
See Filter Silencer Technical Data section for sizing guidelines.

Flange Outlet Assemblies

Flange Outlet	Assembly SCFM Rating	Assembly Part Number Polyester	Assembly Part Number Paper	Dimensions - inches A	B	C	No. of Silencing Tubes	Approx. Wt. lbs	Replacement Element Part No. Polyester	Replacement Element Part No. Paper	Element SCFM Rating
4"	520	FS(12)-235P-400F	FS(12)-234P-400F	13 7/8	3 11/16	12 1/4	6	32	235P	234P	570
4"	520	FS-275P-400F	FS-274P-400F	14	4	16	9	39	275P	274P	1100
5"	800	FS-245P-500F	FS-244P-500F	14	4 1/8	16	14	38	245P	244P	880
5"	800	FS-275P-500F	FS-274P-500F	14	4 1/8	16	14	41	275P	274P	1100
6"	1100	FS-275P-600F	FS-274P-600F	15	5 1/8	16	18	42	275P	274P	1100

See Filter Silencer Technical Data section for sizing guidelines.

125/150# Pattern Flg	Dimensions - inches O.D.	B.C.	B.H.	No. of Holes	Flange Thickness
4"	9	7 1/2	0.75	8	0.5
5"	10	8 1/2	0.88	8	0.5
6"	11	9 1/2	0.88	8	0.5



O.D.: Outside Diameter
B.C.: Bolt Circle
B.H.: Bolt Hole

Note: Model offerings and design parameters may change without notice. See www.solbergmfg.com for most current offering.



Compact Filter Silencers
FS Series ½” – 6” MPT

www.solbergmfg.com

Note: Please read the maintenance instructions given by the OEM for the machinery first. The OEM's manual should be adhered to in order to protect the equipment. Solberg Manufacturing, Inc has made every effort to make sure that these instructions are accurate but is not responsible for any typos, slight variations or for human errors that may occur.

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Maintenance Manual

Compact Filter Silencers

FS Series ½" – 6" MPT

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**For Further Information Please Call: 630-773-1363*

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Section A

INTRODUCTION

The purpose of this manual is instruction on the proper assembly and care of Solberg inlet air filters.

WARNING

This manual must be read and thoroughly understood before using and caring for this air filter. Failure to comply could result in explosion, product/system contamination or personal injury.

This manual should be used as a supplement to the user's understanding of the proper care needed to maintain a safe and dependable air filter. It is the responsibility of the user to interpret and explain all instructions to persons who do not read or understand English BEFORE they are allowed to maintain and use this filter.

This manual should be readily available to all operators responsible for operation and maintenance of the inlet air filters.

We thank you for selecting products from Solberg Manufacturing, Inc. We are confident that our superior filter designs will meet your application requirements.

Section B

GENERAL INFORMATION

1. Identification of Solberg Inlet Air Filters.

All Solberg inlet air filters should have an identification label/nameplate that gives the following information:

Assembly Model #
Replacement Element #

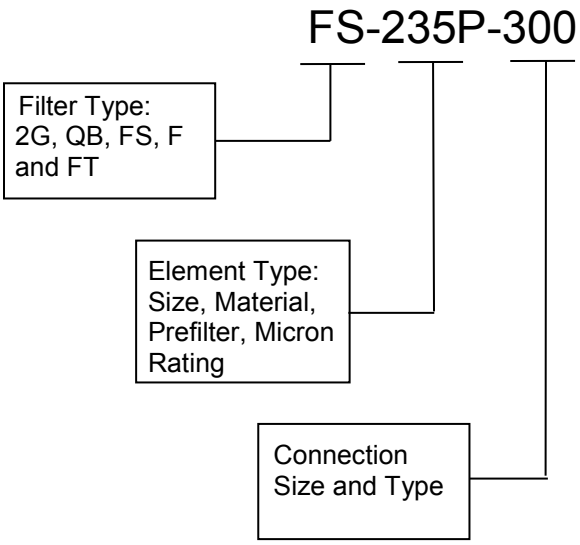
(The exception is OEM supplied units. In this case, please enter the OEM part numbers below.)
Fill in the actual nameplate data from your new Solberg inlet filter(s):

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No.	Filter Model Number	Replacement Element	Initial Delta P Readings
1			
2			
3			
4			
5			

Table 1

The model number designates the filter type, the original element configuration and housing connection size. For example, the following part number identifies the filter as being a 'FS' design filter with a 235 element with prefilter and 3" MPT connection size:



2. Filtration Rules of Thumb

General: For peak output performance from a compressor, blower, vacuum pump, engine, or any other machine that consumes air, one must have clean, unrestricted air. Proper filtration can help stabilize the working environment within rotating equipment even when the external conditions may be quite severe. A critical component in creating the right working conditions is filter sizing. With the properly sized filter, equipment will run smoothly over its entire expected operating life.

A major factor in filtration and filter sizing is air velocity through the filter media. Generally, the slower the velocity of air through a media the higher the filter efficiency and, conversely, the lower the pressure drop. Therefore, the primary goal in filter sizing is to optimize the velocity of air through the media (sometimes called face velocity).

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Rule of Thumb #1: Always begin with the filter cartridge requirements when sizing a filter. Once the appropriate element has been selected then move on to the housing requirements.

Rule of Thumb #2: Always ask or specify a filter based on a micron rating ***with filtration efficiencies***. As an example, stating a requirement for a 1-micron filter is misleading because no efficiency rating has been specified. A 1-micron filter at 95% efficiency may be less efficient than a 5-micron filter at 99% efficiency. For proper air system performance in light and industrial duty environments, a filter with a minimum of 99% filtration efficiency at 5 microns is required.

Rule of Thumb #3: Size your filter correctly by understanding the impact air velocity through a media has on efficiency and pressure drop. Maintain the suggested Air-to-Media ratios listed below based on the external environment listings and Filtration efficiency needs.

Filtration Efficiency Requirements (99%+ efficiency)	**Environmental Conditions**	**Air to Media Ratio**	
Industrial Grade 2-micron **Paper**	Industrial Duty (clean, office/warehouse-like)	30 CFM/ft^2	(51m^3/h)/cm^2
	Severe Duty (workshop, factory-like)	15 CFM/ft^2	(25.5m^3/h)/cm^2
	Extreme Duty (Foundry, Construction-like)	10 CFM/ft^2	(17m^3/h)/cm^2
Industrial Grade 5-micron **Polyester**	Industrial Duty (clean, office/warehouse-like)	50 CFM/ft^2	(85m^3/h)/cm^2
	Severe Duty (workshop, factory-like)	40 CFM/ft^2	(68m^3/h)/cm^2
	Extreme Duty (Foundry, Construction-like)	25 CFM/ft^2	(42.5m^3/h)/cm^2
Industrial Grade 1-micron **Polyester**	Severe Duty (Foundry, Construction-like)	10 CFM/ft^2	(17m^3/h)/cm^2
Industrial Grade 0.3-micron **HEPA** Glass @ 99.97% Efficiency	Industrial Duty (Pre-filtered Applications)	10 CFM/ft^2	(17m^3/h)/cm^2
	Severe Duty (workshop, factory-like)	7 CFM/ft^2	(12m^3/h)/cm^2
	Extreme Duty (Foundry, Construction-like)	5 CFM/ft^2	(8.5m^3/h)/cm^2

Table 2

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Rule of Thumb #4: Pressure drop is also caused by the dirt holding capacity of the element. As the element fills up with dirt, the pressure drop increases. It is important to document the pressure drop across a given filter when it is new and then clean or replace it when the pressure drop increases by 10" to 15" / 250-280mm H_2O over the original reading.

Rule of Thumb #5: The inlet connection greatly influences the overall pressure drop of the filter system. To minimize the restriction contributed by an inlet filter, a velocity of 6,000 ft/min (10200m^3/h) or less is suggested through the outlet pipe. The table below lists the suggested flows based on pipe size:

Pipe Size (inches)	Max Airflow		Pipe Size (inches)	Max Airflow	
1/2"	10 CFM	17m^3/h	2 ½"	195 CFM	332m^3/h
3/4"	20 CFM	34m^3/h	3"	300 CFM	510m^3/h
1"	35 CFM	60m^3/h	4"	520 CFM	884m^3/h
1 ¼"	60 CFM	102m^3/h	5"	800 CFM	1360m^3/h
1 ½"	80 CFM	136m^3/h	6"	1,100 CFM	1870m^3/h
2"	135 CFM	230m^3/h			

Table 3 **Note: This information is for general use only. A qualified engineer must properly design each system.*

3. Element Specifications

Temperature Range: -15° to 220°F / -26° to 105°C
Filter Change-Out Differential: 10" to 15" / 250-380mm H_2O Over Initial Delta P

Media	Micron Rating
Standard Paper	99+% @ 2 micron
Standard Polyester	99+% @ 5 micron
"S" Series Wire Mesh	Epoxy Coated Wire Mesh
"Z" Series Polyester	99+% @ 1 micron
"HE" Series HEPA	99.97% @ 0.3 microns
"U" Series Polyester	99+% @ 25 micron
"W" Series Polyester	99+% @ 100 micron
"S2" Series	Stainless Steel Wire Mesh
"AC" & "ACP" Series	N/A
"Y" Series Polypropylene	99+% @ 5 micron

Table 4

Temperature Range: -15° to 385°F / -26° to 196°C
Filter Change-Out Differential: 10" to 15"/ 250-380mm H_2O Over Initial Delta P

Media	Micron Rating
"MX" & "MXD" Series – Nomex Cloth	99+% @ 5 micron

Table 5

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4. Element Cleaning - Inlet Filtration

Solberg elements should be cleaned or replaced, once the pressure drop reaches 15 to 20-inches water column (380 - 500mm WC) above the initial pressure drop of the installation.

The decision to clean the element rather than replace it is left to the discretion of the operator. Any damage which results from by-pass or additional pressure drop created by element cleaning is the sole responsibility of the operator.

WARNING

The overall performance of a filter element is altered once cleaned.

The initial pressure drop after cleaning will be greater than the original, clean pressure drop of the element.

After each subsequent cleaning, the initial pressure drop will continue to increase.

Under all circumstances, the initial pressure drop of the element needs to be maintained at less than 20-inches water column (500mm WC).

Cleaned elements that exceed 20-inches water column (500mm WC) at start-up should be replaced with new elements.

With many types of equipment, the maximum pressure drop allowed will be dictated by the ability of the equipment to perform to its rated capacity. Under all circumstances, the operator should avoid exceeding the manufacturer's recommended maximum pressure drop for their specific equipment.

A. ***Polyester Element***: The polyester element may be washed in warm soapy water, vacuumed, gently blown out or replaced. The element should be dry before reinstallation. The element should be replaced after a maximum of three cleanings.
B. ***Paper Element***: The paper element may be lightly blown with low pressure air. It is disposable and in most cases should be replaced with a new element.

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C. ***Polyurethane Prefilter***: The prefilter may be washed as a sponge or replaced to give the element a longer service life.
D. ***Epoxy Coated Wire Mesh and Stainless Steel Wire Mesh Elements***: Cleaning instructions similar to polyester, except mild solvents may be used.
E. ***Activated Carbon Element***: Not cleanable
F. ***Polypropylene Element***: Cleaning instructions similar to polyester
G. ***Nomex Cloth Element***: Cleaning instructions similar to polyester

If you are not confident that the integrity of the element was maintained during cleaning, it is recommended that a new element be installed. Also, spare parts such as gaskets, wing nuts and washers can be supplied upon request.

Section C

PROCEDURES

1. Installation.

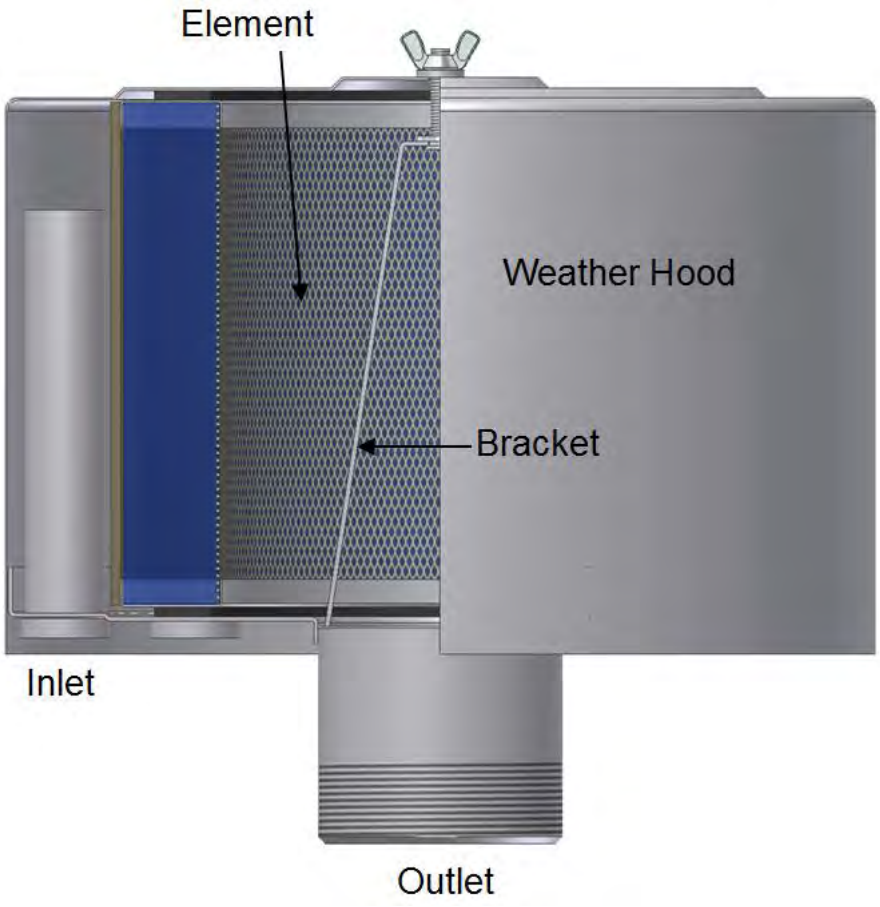


Figure C.1: Housing Terms

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A. Maximum operating temperature for most Solberg inlet air filter products is 220°F / 105°C. Temperatures in excess of this could cause damage to elements, media and elastomers. High temperature products are available.

B. Direction of flow is typically from the outside of the element to the inside of the element. Most products have arrows indicating direction of flow on the inlet and outlet ports.

C. Ensure that pipe/flange connections are adequately sealed so the potential for leaks is reduced to a minimum.

2. Disconnecting canister top from canister base.

Remove weather hood by loosening wing nut and lifting off.

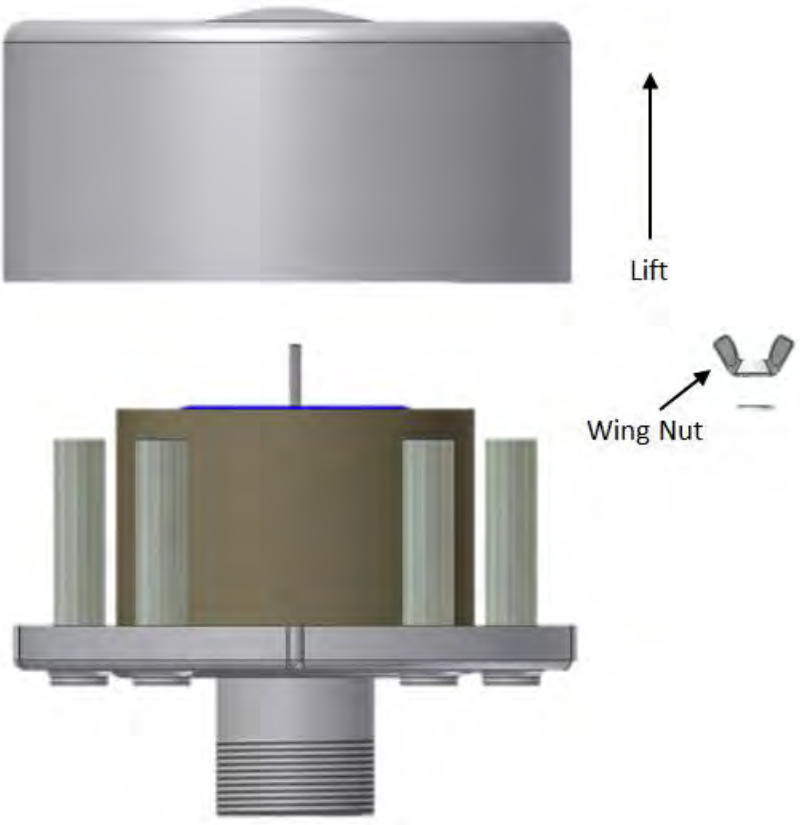


Figure C.2.1: Weather hood removal.

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3. **Removing element for service/maintenance.**

   A. Carefully lift element off of the internal bracket and housing base.

   B. Clean sealing surfaces of housing and element endcaps so that they are free of dirt or any other particulate.

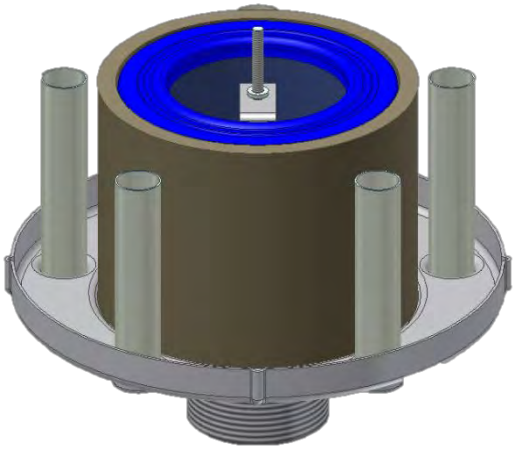


Figure C.3.1: Element sitting in housing base.

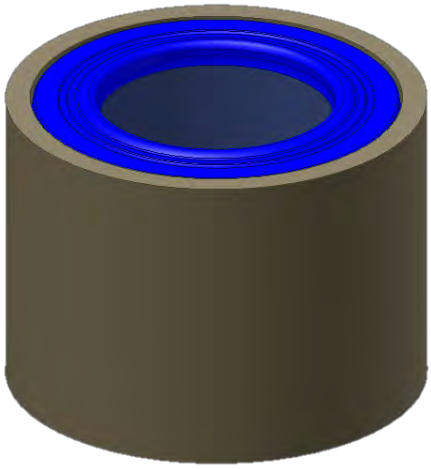


Figure C.3.2: Element with pre-filter.

WARNING

Failure to comply with these instructions may result in system or equipment contamination.

4. **Securing Element.**

   Place new or cleaned element evenly on base plate. Be sure element seats properly on base and there is no dirt or particulate present on sealing surfaces. See Figure C.3.1. With multiple element stacks place elements in line with base element and ensure elements seat properly.

WARNING

Defective installation may cause system or pump contamination. Use only genuine Solberg replacement parts.

Solberg Manufacturing, Inc., 1151 Ardmore Itasca, IL 60143 USA
Ph: 630.773.1363 Fax: 630.773.0727 Email: sales@solbergmfg.com Web: www.solbergmfg.com

5. **Securing canister top to canister base.**

   A. Make sure all surfaces are free from dust and other particulate.

   B. Place weather hood over housing base and element. Feed threaded rod into corresponding bolt hole and tighten. Note: Do NOT over tighten!



Figure C.5.1: Weather hood and wing nut in secured position.

6. **Equipment Startup.**

   A. Be sure to read the instructions on installation or element replacement as listed above before starting equipment.

WARNING

If at any time the operator is unable to verify the integrity of the element or any housing feature, the factory or a regional representative should be contacted prior to start-up.

   B. Please check the listed steps prior to startup.

      1. Check element to make sure it is seated properly on element base or sealing surface.

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WARNING

Failure to seat the element properly may result in contaminant by-pass resulting in damage to equipment.

2. Check weather hood is installed correctly onto housing.

WARNING

If the air flow is reversed through a Solberg filter unit, be sure to check the element and housing internals for damage. Failure to do so may result in damage to equipment.

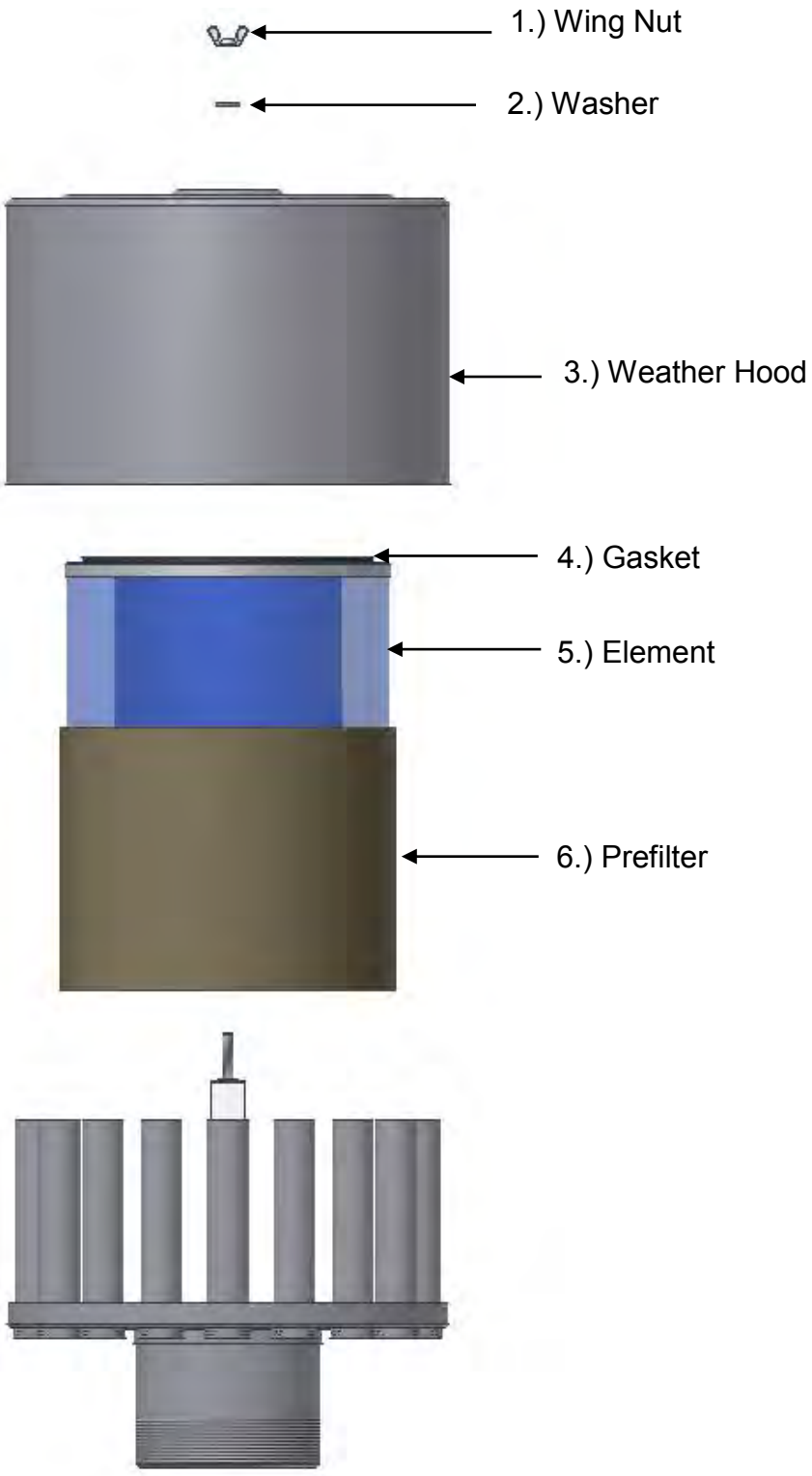
3. Be sure all fasteners and hardware have been tightened.

Section D

MAINTENANCE RECOMMENDATIONS

1. Pressure drop readings are recommended to have an effective air filter. Always document initial pressure drop during start-up when element is clean. Replacement cartridge is needed when system experiences 10” to 15” / 250-380mm H^2O above drop above the initial reading. Refer to page 4 for initial values.
2. Always check inlets/outlets, element base and its components when replacing element to insure cleanliness. Wipe clean if necessary.
3. Operate only when a proper seal exists.

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Compact Filter Silencer Available Replacement Parts

Solberg Manufacturing, Inc., 1151 Ardmore Itasca, IL 60143 USA
Ph: 630.773.1363 Fax: 630.773.0727 Email: sales@solbergmfg.com Web: www.solbergmfg.com

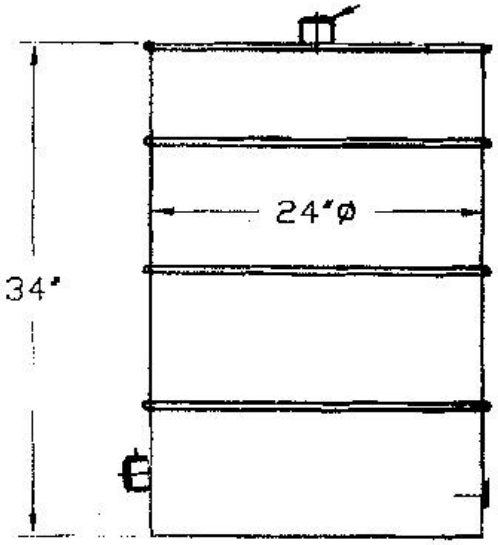
Available Replacement Part by Product Number						
Product #	**Element****	**Prefilter**	**Gasket**	**Weather Hood**	**Washer**	**Wing Nut**
FS-14P-XXX	14	9010200	N/A	1050300+01	5040200	5030500
FS-15P-XXX	15	9010200	N/A	1050300+01	5040200	5030500
FS-18P-XXX	18	9010400	N/A	1050500+01	5040200	5030500
FS-19P-XXX	19	9010400	N/A	1050500+01	5040200	5030500
FS-30P-XXX	30	9010500	N/A	1050900+01	5040200	5030500
FS-31P-XXX	31	9010500	N/A	1050900+01	5040200	5030500
FS-230P-XXX	230	9010700	N/A	1051000+01	5020150	5030600
FS-231P-XXX	231	9010700	N/A	1051000+01	5020150	5030600
FS-234P-XXX	234	9010800	N/A	1051200+01	5020150	5030600
FS-235P-XXX	235	9010800	N/A	1051200+01	5020150	5030600
FS-244P-XXX	244	9010900	N/A	1051200+01	5020150	5030600
FS-245P-XXX	245	9010900	9110100	1051200+01	5020150	5030600
FS-274P-XXX	274	9011000	9110200	1051200+01	5020150	5030600
FS-275P-XXX	275	9011000	9110200	1051200+01	5020150	5030600

**Note: *Even element numbers are Paper elements and odd element numbers are Polyester elements.*

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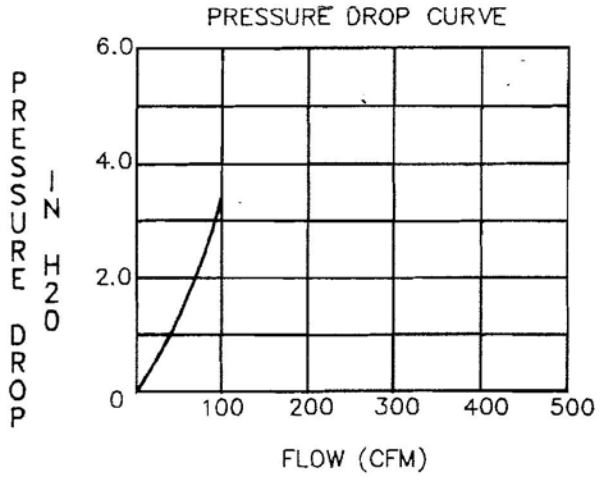
CARBON FILTRATION SYSTEMS INC.

VAPOR DRUM SERIES
Model VDS-55-2”



SPECIFICATIONS

Container	– 24" dia/ x 34" hgt.
	– (D) double epoxy lined steel
	– (S) high density polythylene
Carbon	– 200 lbs. virgin high activity carbon
Max. Suggested Flow	– 100 CFM
Max. Rated Flow	– 150 CFM
Shipping Weight	– 250 lbs.
Inlet	– 2" fpt
Outlet	– 2" fpt
Drain	– 2" Bung



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SECTION 5 - PROCESS INSTRUMENTATION

VACUUM INDICATORS, [-]60 TO 0 IWC(V) - DWYER LPG4-D7522N

MOISTURE SEPARATOR EMERGENCY HIGH LEVEL SWITCH - MADISON M8700

SVE BLOWER LOW VACUUM SWITCH, 4-20 IN W.C. SET AT 4 IWC(V) - DWYER 1950-20-2F

TEMPERATURE INDICATORS, 0 TO 250 F - AV 1NFY4

PRESSURE INDICATOR, 0-25 IWC - DWYER LPG4-D8222N

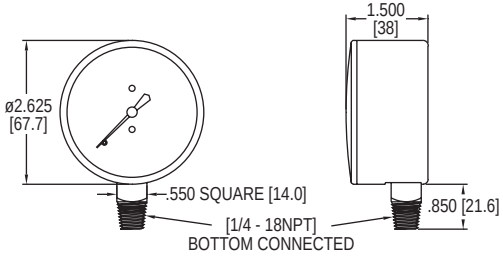
BLOWER DISCHARGE HIGH TEMPERATURE SWITCH SET AT 150 F - UNITED ELECTRIC B54-103

SERIES LPG4

2.5″ LOW PRESSURE GAGE

1.5% Full-Scale Accuracy in a 2.5″ Gage





Our **Series LPG4 2.5″ Low Pressure Gage** offers top of the line performance and accuracy for pressure and vacuum applications up to and including 160 in w.c. The LPG4 is constructed from a single beryllium-copper diaphragm affixed to a precision-machined brass plate. This innovative design, together with a high-precision, milled-teeth brass movement and nickel-silver pinion and bearing surface, provide the user with a top of the line low pressure instrument.

FEATURES/BENEFITS
- Low pressure gage provides a selection to meet specific application
- Specifie with high ambient and process temperature ratings mean more robust uses and longer service-life
- High accuracy gage for applications requiring more precise measurement is a concern

APPLICATIONS
- Air flow indicatio
- Liquid level
- Draft measurement

SPECIFICATIONS	
Service: Compatible gases & liquids. **Wetted Materials:** Brass and beryllium copper. **Housing:** Drawn steel, black finish **Lens:** Polycarbonate (removable). **Accuracy:** ±1.5% FS. **Pressure Limit:** 100% of range scale.	**Temperature Limits:** Process: -40 to 160°F (-40 to 70°C); Ambient: -40 to 140°F (-40 to 60°C). **Size:** 2.5″ (63 mm). **Process Connections:** 1/4″ male NPT. **Enclosure Rating:** NEMA 3 (IP54). **Weight:** 7.3 oz (0.21 kg).

OPTIONS	
Use order code:	**Description**
NISTCAL-PG1	NIST traceable calibration certificat

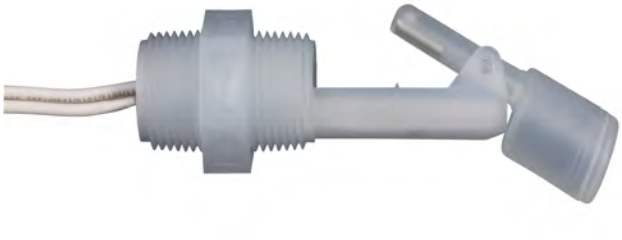
MODEL CHART			
Model	**Range**	**Model**	**Range**
LPG4-D7122N	-10 to 0 in w.c. (-2.5 to 0 kPa)	**LPG4-D8322N**	0 to 40 in w.c. (0 to 10 kPa)
LPG4-D7222N	-15 to 0 in w.c. (-4 to 0 kPa)	**LPG4-D8422N**	0 to 60 in w.c. (0 to 15 kPa)
LPG4-D7322N	-25 to 0 in w.c. (-6 to 0 kPa)	**LPG4-D8522N**	0 to 80 in w.c. (0 to 20 kPa)
LPG4-D7422N	-40 to 0 in w.c. (-10 to 0 kPa)	**LPG4-D8622N**	0 to 100 in w.c. (0 to 25 kPa)
LPG4-D7522N	-60 to 0 in w.c. (-15 to 0 kPa)	**LPG4-D8722N**	0 to 160 in w.c. (0 to 40 kPa)
LPG4-D7622N	-80 to 0 in w.c. (-20 to 0 kPa)	**LPG4-D8922N**	-4 to 0 to 6 in w.c. (-1 to 0 to 1.5 kPa)
LPG4-D7722N	-100 to 0 in w.c. (-25 to 0 kPa)	**LPG4-D9022N**	-6 to 0 to 10 in w.c. (-1.5 to 0 to 2.5 kPa)
LPG4-D7822N	-160 to 0 in w.c. (-40 to 0 kPa)	**LPG4-D9122N**	-8 to 0 to 16 in w.c. (-2 to 0 to 4 kPa)
LPG4-D7922N	-235 to 0 in w.c. (-60 to 0 kPa)	**LPG4-D9222N**	-16 to 0 to 24 in w.c. (-4 to 0 to 6 kPa)
LPG4-D8022N	0 to 10 in w.c. (0 to 2.5 kPa)	**LPG4-D9322N**	-24 to 0 to 40 in w.c. (-6 to 0 to 10 kPa)
LPG4-D8122N	0 to 15 in w.c. (0 to 3.75 kPa)	**LPG4-D9422N**	-30 to 0 to 50 in w.c. (-7.5 to 0 to 12.5 kPa)
LPG4-D8222N	0 to 25 in w.c. (0 to 6 kPa)	**LPG4-D9522N**	-40 to 0 to 60 in w.c. (-10 to 0 to 15.0 kPa)

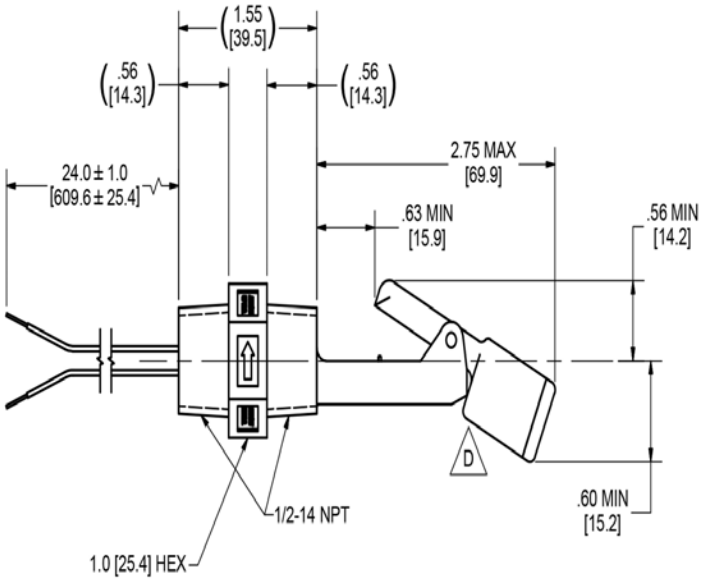
USA: California Proposition 65
⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

Model # M8700 Technical Data Sheet

Side-mount float switch, polypropylene, 1/2" x 1/2" NPT

Madison Home » Point Level Float Switch Series » Side-mount float switch, polypropylene, 1/2" x 1/2" NPT





Applications:

- Single point detection of high/low levels through side wall of tank
- Polypropylene is a recognized material for food material handling and conveying, and polypropylene-based products are ideal for food applications.
- Polypropylene is also good for use in agriculture, and for contact with many industrial fluids. (See chemical compatibility chart)
- Can be used in low temperature food equipment applications (up to 221F, 105C) such as food service steamers and proofers.

Related Products:



M8700-C

View in-stock products ready to ship today at Madisonco.com/buy

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www.madisonco.com

MADE IN THE USA

Model # M8700 Technical Data Sheet

Side-mount float switch, polypropylene, 1/2" x 1/2" NPT

Specifications:

Approvals	CE, UL, CSA, NSF, FLORIDA DEP EQ682
Electrical Ratings	240 VAC, 0.14A; 120 VAC, 0.28A; 120 VDC, 0.07A; 24 VDC, 0.28A
Float Material	Polypropylene
Float SG	0.5
Lead Wires	24", 22 AWG, MTW Insulated
Max Pressure	100 PSI
Max Temperature	221°F (105°C)
Mounting	1/2" x 1/2" NPT
Note	Switches are rated for resistive loads. See our Electrical Considerations for UL guidelines for current (Amperes resistive) at different voltages
Stem Material	Polypropylene
Switch Rating	30 Watt, SPST
Type	Side-mounted float switch

View and buy online:
https://www.madisonco.com/products/m8700-side-mount-float-switch-polypropylene-1-2-x-1-2-npt

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SERIES 1950 | EXPLOSION-PROOF DIFFERENTIAL PRESSURE SWITCH

FEATURES/BENEFITS

- **Explosion-proof and weatherproof housing provides device protection for outdoor use or harsh environment operation**
- **External set point screw provides easy access without opening or disassembling enclosure**
- **Easily accessible electrical connection simplifies the installation**



APPLICATIONS

- HVAC applications
- Process applications
- All-weather applications

DESCRIPTION

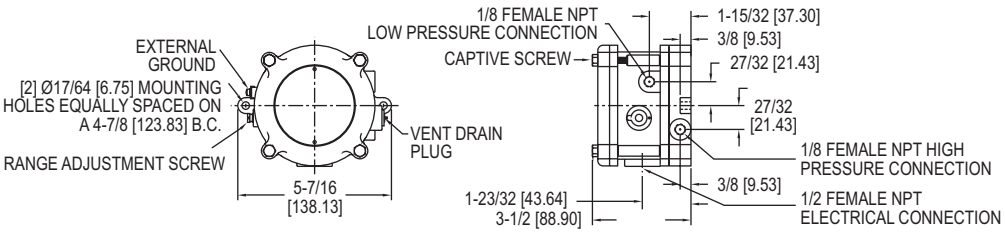
The **Series 1950 Explosion-Proof Differential Pressure Switch** combines the best features of the popular Dwyer® Series 1900 Pressure Switch with an integral explosion-proof and weatherproof housing, making it an exceptional value for either application. It is CE, UL and CSA listed, FM approved for use in Class I, Div 1, Groups C and D, Class II Groups E, F, and G and Class III hazardous atmospheres NEMA 7 & 9. Rain tight NEMA 3 (IP54), weatherproof features include a drain plug and O-ring seal in cover. Electrical connections are easily made by removing front cover. For convenience the set point adjustment screw is located on the outside of the housing. Twelve models offer set points from .03 to 20 in w.c. (0.0075 to 5 kPa) and from .5 to 60 psi (0.035 to 3.5 bar). The unit is very light and compact - about half the weight and bulk of other explosion-proof or weatherproof switches with separate enclosures.

SPECIFICATIONS

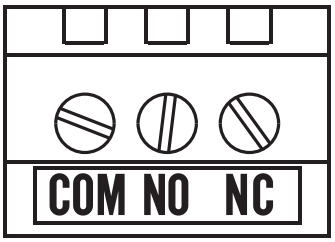
Service	Air and non-combustible, compatible gases.
Wetted Materials	Consult factory.
Temperature Limits	-40 to 140°F (-40 to 60°C); 0 to 140°F (-17.8 to 60°C) for 1950P-8, 15, 25, and 50. -30 to 130°F (-34.4 to 54.4°C) for 1950-02.
Pressure Limits (Continuous)	1950's - 45 in w.c. (0.11 bar); 1950P's - 35 psi (2.41 bar); 1950P-50 only - 70 psi (4.83 bar). Surge: 1950's - 10 psi (0.69 bar), 1950P's - 50 psi (3.45 bar), 1950P-50 only - 90 psi (6.21 bar).
Enclosure Rating	NEMA 3 (IP54), NEMA 7 & 9.
Switch Type	Single-pole double-throw (SPDT).
Electrical Rating	15 A @, 125, 250, 480 VAC, 60 Hz. Resistive 1/8 HP @ 125 VAC, 1/4 HP @ 250 VAC, 60 Hz.
Electrical Connections	3 screw type, common, normally open and normally closed.
Process Connections	1/8″ female NPT.
Mounting Orientation	Diaphragm in vertical position. Consult factory for other position orientations.
Set Point Adjustment	Screw type on top of housing.
Weight	3.25 lb (1.5 kg); 1950-02 model, 4.4 lb (2 kg).
Agency Approvals	CE, CSA, FM, UL.

DWYER INSTRUMENTS, INC.
T: 219-879-8000 | F: 219-872-9057 | info@dwyermail.com
800-872-9141

DIMENSIONS



WIRING DIAGRAM



HOW TO ORDER

Use the **bold** characters from the chart below to construct a product code.

1950 **-02** **-2** **S** **-AT**

SWITCH TYPE
1950: Pressure switch - inches w.c.
~~**1950P:** Pressure switch - PSID~~

RANGE
-02: 0.03 - 0.10 in w.c.
-00: 0.07 - 0.15 in w.c.
-0: 0.15 - 0.5 in w.c.
-1: 0.4 - 1.6 in w.c.
-5: 1.4 - 5.5 in w.c.
~~**-10:** 3.0 - 11.0 in w.c.~~
-20: 4.0 - 20.0 in w.c.
-2: 0.5 - 2.0 psid
-8: 1.5 - 8.0 psid
-15: 3.0 - 15.0 psid
-25: 4.0 - 25.0 psid
-50: 15.0 - 50.0 psid

MICRO SWITCH TYPE
-2: 10G mica silver contact*
~~**-6:** 10G phenolic gold contact~~
-M: 10C phenolic silver contact

OPTIONS
-AT: Aluminum tag
-PRESET: Preset
-ST: Stainless steel tag

DIAPHRAGM MATERIAL
B: Buna-N
F: Flurosilicone*
N: Neoprene
S: Silicone
V: Fluroelastomer

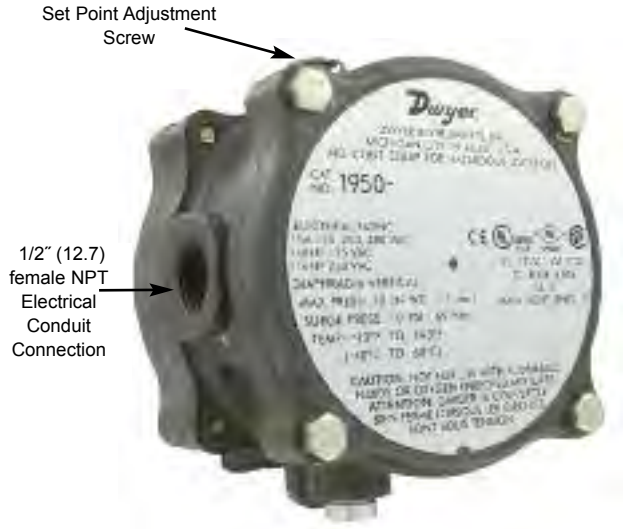
*The 2F is standard

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800-872-9141

Series 1950 Explosion-Proof Differential Pressure Switches

Specifications - Installation and Operating Instructions



Series 1950 Explosion-Proof Differential Pressure Switches combine the best features of the Series 1900 Pressure Switch with an integral explosion-proof and weather-proof housing. Each unit is UL & CSA listed; FM approved for use in Class I, Groups C & D; Class II, Groups E, F, & G; and Class III atmospheres (NEMA 7 & 9). They are totally rain-tight for outdoor installations. Twelve models allow set-points from .03 to 20 inches w.c. and from .5 to 50 psi (3.4 to 345 kPa).

Easy access to the SPDT switch for electrical hook-up is provided by removing the top plate of the three-part aluminum housing. Adjustment to the set point of the switch can be made without disassembling the housing. The unit is very compact, about half the weight and bulk of equivalent conventional explosion-proof switches.

CAUTION
For use only with air or compatible gases. Use of the Model 1950 switch with explosive media connected to the Low pressure port (including differential pressure applications in such media) is not recommended. Switch contact arcing can cause an explosion inside the switch housing which, while contained, may render the switch inoperative. If switch is being used to sense a single positive pressure relative to atmosphere, run a line from the low pressure port to a non-hazardous area free of combustible gases. This may increase response time on -0 and -00 models.

Note: The last number-letter combination in the model number identifies the switch's electrical rating (number) and diaphragm material (letter). The 2F combination is standard as described in the physical data above. In case of special models, a number 1 rating is the same as 2; a number 3 or 4 rating is 10A 125, 250, 480 VAC; 1/8 H.P. 125 VAC; 1/4 H.P. 250 VAC; a number 5 or 6 rating is 1A 125 VAC. Letter B indicates a Buna-N diaphragm; N = Neoprene; S = Silicone; and V = Viton®.

UL and CSA Listed, FM Approved For
CL. I GR. C, D - CL. II GR. E, F, G - CL. III

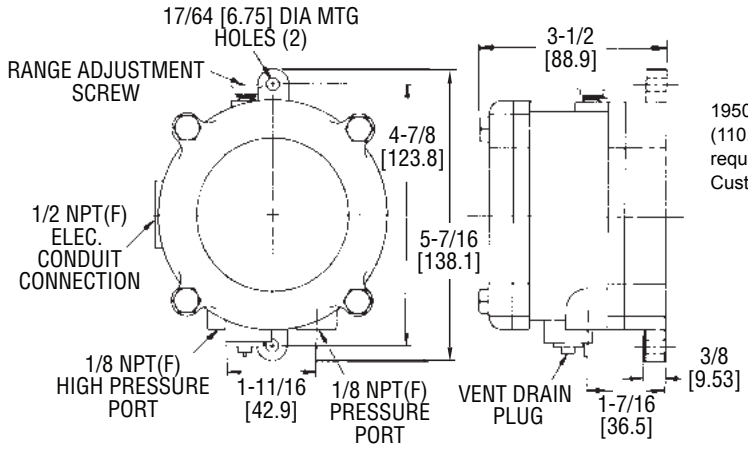
Series 1950 Switches
Operating ranges and deadbands

To order specify Model Number	Operating Range: Inches, W.C.	Approximate Dead Band	
		At Min. Set Point	At Max. Set Point
1950-02-2S	0.03 to 0.10	0.025	0.05
1950-00-2F	0.07 to 0.15	0.04	0.05
1950-0-2F	0.15 to 0.5	0.10	0.15
1950-1-2F	0.4 to 1.6	0.15	0.20
1950-5-2F	1.4 to 5.5	0.3	0.4
1950-10-2F	3.0 to 11.0	0.4	0.5
1950-20-2F	4.0 to 20.0	0.4	0.6
	Operating	Approximate Dead Band	
Model Number	Range: PSI	Min. Set Point	Max. Set Point
1950P-2-2F	0.5 to 2.0	0.3 psi	0.3 psi
1950P-8-2F	1.5 to 8.0	1.0 psi	1.0 psi
1950P-15-2F	3.0 to 15.0	0.9 psi	0.9 psi
1950P-25-2F	4.0 to 25.0	0.7 psi	0.7 psi
1950P-50-2F	15.0 to 50	1.0 psi	1.5 psi

SPECIFICATIONS
Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Temperature Limits: -40 to 140°F (-40 to 60°C); 0 to 140°F (-17.8 to 60°C) for 1950P-8, 15, 25, and 50. -30 to 130°F (-34.4 to 54.4°C) for 1950-02.
Pressure Limits:
Continuous: 1950's - 45″ w.c. (0.11 bar);
1950P's - 35 psi (2.41 bar); 1950P-50 only - 70 psi (4.83 bar).
Surge: 1950's - 10 psi (0.69 bar), 1950P's - 50 psi (3.45 bar), 1950P-50 only - 90 psi (6.21 bar).
Enclosure Rating: IP54, NEMA 3, 7 and 9.
Switch Type: Single-pole double-throw (SPDT).
Electrical Rating: 15 A @, 125, 250, 480 VAC, 60 Hz. Resistive 1/8 HP @ 125 VAC, 1/4 HP @ 250 VAC, 60 Hz.
Electrical Connections: 3 screw type, common, normally open and normally closed.
Process Connections: 1/8″ female NPT.
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.
Set Point Adjustment: Screw type on top of housing.
Weight: 3.25 lb (1.5 kg); 1950-02 model, 4.4 lb (2 kg).
Agency Approvals: CE, UL, CSA, FM.

RESPONSE TIME: Because of restrictive effect of flame arrestors, switch response time may be as much as 10-25 seconds where applied pressures are near set point.

DWYER INSTRUMENTS, INC.
P.O. BOX 373 • MICHIGAN CITY, INDIANA 46361, U.S.A.
Phone: 219/879-8000 **www.dwyer-inst.com**
Fax: 219/872-9057 **e-mail: info@dwyer-inst.com**



1950-02: 7-3/4″ (196.9) dia. x 4-11/32″ (110.3) depth. For complete dimensions request drawing 28-700175-00 from our Customer Service Department

1950 Switch Outline Dimensions

INSTALLATION

1. Select a location free from excess vibration and corrosive atmospheres where temperatures will be within the limits noted under Specifications on reverse. Switch may be installed outdoors or in areas where the hazard of explosion exists. See reverse for specific types of hazardous service.

2. Mount standard switches with the diaphragm in a vertical plane and with switch lettering and nameplate in an upright position. Some switches are position sensitive and may not reset properly unless they are mounted with the diaphragm vertical.

3. Connect switch to source of pressure, vacuum or differential pressure. Metal tubing with 1/4″ O.D. is recommended, but any tubing which will not restrict the air flow can be used. Connect to the two 1/8″ female NPT pressure ports as noted below:

A. Differential pressures - connect pipes or tubes from source of greater pressure to high pressure port marked HIGH PRESS, and from source of lower pressure to low pressure port marked LOW PRESS.

B. Pressure only (above atmospheric pressure) - connect tube from source of pressure to high pressure port. The low pressure port is left open to atmosphere.

C. Vacuum only (below atmospheric pressure) - connect tube from source of vacuum to low pressure port. The high pressure port is left open to atmosphere.

4. To make electrical connections, remove the three hex head screws from the cover and after loosening the fourth captive screw, swing the cover aside. Electrical connections to the standard single pole, double throw snap switch are provided by means of terminals marked “COM” (common), “NO” (norm open), “NC” (norm closed). The normally open contacts close and the normally closed contacts open when pressure increases beyond the set point. Switch loads for standard models should not exceed the maximum specified current rating of 15 amps resistive. Switch capabilities decrease with an increase in ambient temperature, load inductance, or cycling rate. Whenever an application involves one or more of these factors, the user may find it desirable to limit the switched current to 10 amps or less in the interest of prolonging switch life.

ADJUSTMENT: To Change the Set point

1. Remove the plastic cap and turn the slotted Adjust-ment Screw at the top of the housing clockwise to raise the set point pressure and counterclockwise to lower the set point. After calibration, replace the plastic cap and re-check the set point.

2. The recommended procedure for calibrating or checking calibration is to use a “T” assembly with three rubber tubing leads, all as short as possible and the entire assembly offering minimum flow restriction. Run one lead to the pressure switch, another to a manometer of known accuracy and appropriate range, and apply pressure through the third tube. Make final approach to the set point very slowly. Note that manometer and pressure switch will have different response times due to different internal volumes, lengths of tubing, fluid drainage, etc. Be certain the switch is checked in the position it will assume in use, i.e. with diaphragm in a vertical plane and switch lettering and Dwyer nameplate in an upright position.

3. For highly critical applications check the set point adjustment and if necessary, reset it as noted in step A.

MAINTENANCE

The moving parts of these switches need no maintenance or lubrication. The only adjustment is that of the set point. Care should be taken to keep the switch reasonably clean. Periodically the vent drain plug should be rotated, then returned to its original position. This will dislodge deposits which could accumulate in applications where there is excessive condensation within the switch. The Series 1950 Explosion-Proof Differential Pressure Switch is not field serviceable and should be returned if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization number before shipping.

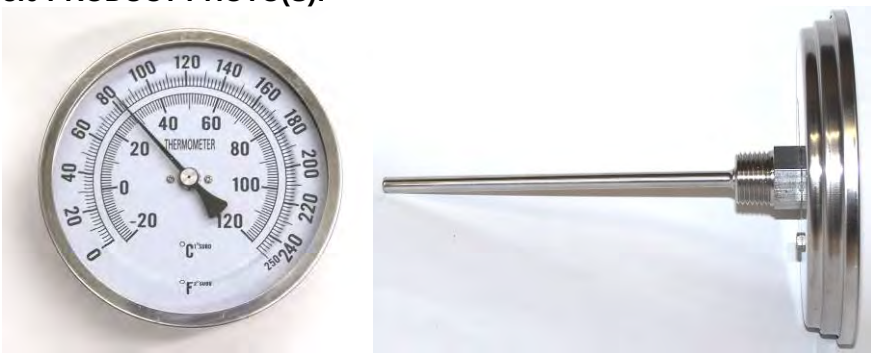
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DWYER INSTRUMENTS, INC.
P.O. BOX 373 • MICHIGAN CITY, INDIANA 46360, U.S.A.
Phone: 219/879-8000 **www.dwyer-inst.com**
Fax: 219/872-9057 **e-mail: info@dwyer-inst.com**

GRAINGER® FOR THE ONES WHO GET IT DONE GRAINGER INTERNATIONAL, INC. GLOBAL SOURCING DIVISION	-- GGS TECHNICAL SPECIFICATION --			
	SPECIFICATION NUMBER: 1NFY4_TSRev1.doc	AUTHOR: Hoskinson	TITLE: ENG	REL. DATE: 5/25/07
	GGS MODEL NUMBER(s): 1NFY4	DESCRIPTION: Industrial thermometer	REVISION #: 1	REV. DATE: 8/10/07

1.0 BRAND:	No brand
2.0 PRODUCT DESCRIPTION:	Bimetal Industrial Thermometer

3.0 PRODUCT PHOTO(S):



4.0 PRODUCT REQUIREMENTS:

4.1 Features & Performance	Requirement
Temperature scale(s)	°F: 0 to 250 °C: -20 to 120
Connection location/type	Back; 1/2 inch NPT
Dial size (inches)	3
Stem length (inches)	2 1/2
Stem diameter (inches)	1/4 In
Rotated degrees	N/A
Angled degrees	N/A
Full scale accuracy	≤40°F: ±1.5% 41 to 200°F: ±1% ≥201°F: ±1.5%
Calibration	External Adjustment

4.2 Materials & Construction	Requirement
Case	Stainless Steel Hermetically Sealed to Prevent Icing/Fogging Inside
Stem	Stainless Steel
Coil dampening	Silicone for Superior Time Response and Vibration Dampening
Dial face	Glass

4.3 Finish / Color	Requirement
All Surface Finishes	a) Surface finishes must be uniform and continuous. The surface finish must not exhibit any visual defects such as blisters, rust, corrosion, scratches, peeling, bubbles, and/or cracking. b) All exposed surfaces must be free of burrs and sharp edges. c) All applied finishes must adhere to the surface and show no signs of delamination or peeling.
Finish	Stainless Steel

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This specification is based on the manufacturers design and is to be used as a Quality Control document.

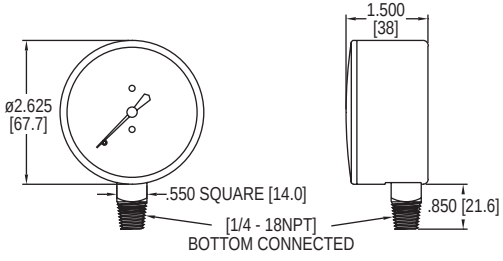
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SERIES LPG4

2.5″ LOW PRESSURE GAGE

1.5% Full-Scale Accuracy in a 2.5″ Gage





Our **Series LPG4 2.5″ Low Pressure Gage** offers top of the line performance and accuracy for pressure and vacuum applications up to and including 160 in w.c. The LPG4 is constructed from a single beryllium-copper diaphragm affixed to a precision-machined brass plate. This innovative design, together with a high-precision, milled-teeth brass movement and nickel-silver pinion and bearing surface, provide the user with a top of the line low pressure instrument.

FEATURES/BENEFITS
- Low pressure gage provides a selection to meet specific application
- Specifie with high ambient and process temperature ratings mean more robust uses and longer service-life
- High accuracy gage for applications requiring more precise measurement is a concern

APPLICATIONS
- Air flow indicatio
- Liquid level
- Draft measurement

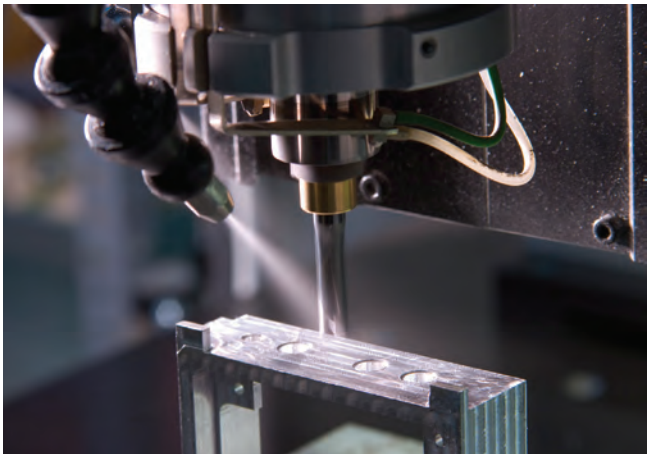
SPECIFICATIONS	
Service: Compatible gases & liquids. **Wetted Materials:** Brass and beryllium copper. **Housing:** Drawn steel, black finish **Lens:** Polycarbonate (removable). **Accuracy:** ±1.5% FS. **Pressure Limit:** 100% of range scale.	**Temperature Limits:** Process: -40 to 160°F (-40 to 70°C); Ambient: -40 to 140°F (-40 to 60°C). **Size:** 2.5″ (63 mm). **Process Connections:** 1/4″ male NPT. **Enclosure Rating:** NEMA 3 (IP54). **Weight:** 7.3 oz (0.21 kg).

OPTIONS	
Use order code:	**Description**
NISTCAL-PG1	NIST traceable calibration certificat

MODEL CHART			
Model	**Range**	**Model**	**Range**
LPG4-D7122N	-10 to 0 in w.c. (-2.5 to 0 kPa)	**LPG4-D8322N**	0 to 40 in w.c. (0 to 10 kPa)
LPG4-D7222N	-15 to 0 in w.c. (-4 to 0 kPa)	**LPG4-D8422N**	0 to 60 in w.c. (0 to 15 kPa)
LPG4-D7322N	-25 to 0 in w.c. (-6 to 0 kPa)	**LPG4-D8522N**	0 to 80 in w.c. (0 to 20 kPa)
LPG4-D7422N	-40 to 0 in w.c. (-10 to 0 kPa)	**LPG4-D8622N**	0 to 100 in w.c. (0 to 25 kPa)
LPG4-D7522N	-60 to 0 in w.c. (-15 to 0 kPa)	**LPG4-D8722N**	0 to 160 in w.c. (0 to 40 kPa)
LPG4-D7622N	-80 to 0 in w.c. (-20 to 0 kPa)	**LPG4-D8922N**	-4 to 0 to 6 in w.c. (-1 to 0 to 1.5 kPa)
LPG4-D7722N	-100 to 0 in w.c. (-25 to 0 kPa)	**LPG4-D9022N**	-6 to 0 to 10 in w.c. (-1.5 to 0 to 2.5 kPa)
LPG4-D7822N	-160 to 0 in w.c. (-40 to 0 kPa)	**LPG4-D9122N**	-8 to 0 to 16 in w.c. (-2 to 0 to 4 kPa)
LPG4-D7922N	-235 to 0 in w.c. (-60 to 0 kPa)	**LPG4-D9222N**	-16 to 0 to 24 in w.c. (-4 to 0 to 6 kPa)
LPG4-D8022N	0 to 10 in w.c. (0 to 2.5 kPa)	**LPG4-D9322N**	-24 to 0 to 40 in w.c. (-6 to 0 to 10 kPa)
LPG4-D8122N	0 to 15 in w.c. (0 to 3.75 kPa)	**LPG4-D9422N**	-30 to 0 to 50 in w.c. (-7.5 to 0 to 12.5 kPa)
LPG4-D8222N	0 to 25 in w.c. (0 to 6 kPa)	**LPG4-D9522N**	-40 to 0 to 60 in w.c. (-10 to 0 to 15.0 kPa)

USA: California Proposition 65
⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

PRESSURE, VACUUM AND TEMPERATURE









FEATURES

- Compact Size
- Wide Selection of Adjustable Ranges:
  Pressure: 30" Hg Vac to 6000 psi (-1 to 413,7 bar)
  Temperature: -130 to 650°F (-90 to 343.3°C)
- Choice of One or Two Switch Outputs
- Adjustable or Narrow Deadband Options
- Reference Dial or Hex Screw Set Point Adjustment

54 Series

OVERVIEW

The 54 Series offers the OEM a combination of reliable performance and low cost. Available in pressure and temperature versions, with single or dual SPDT outputs and enclosed or open frame (skeleton) construction, the 54 Series family provides design versatility.

The 54 has been field-proven in a wide variety of OEM applications, including medical, laboratory, fire protection and heating equipment.



Remote mounting temperature model



Direct mounting temperature model



Pressure model with reference dial

FEATURES

- Compact size
- Choice of one or two switch outputs
- Reference dial or hex screw-type setting
- Optional 1/2" NPT (male) by 1/8" NPT (female) polysulfone® pressure connection
- Optional external manual reset
- NEMA 1 or open frame (skeleton) versions for OEM applications
- Brass bellows models

Polysulfone® is a registered trademark of Amoco

SPECIFICATIONS

STORAGE TEMPERATURE	-65 to 160°F (-54 to 71°C)
AMBIENT TEMPERATURE LIMITS	
Pressure Models	Models 126-164, 610-614: -40 to 160°F (-40 to 71°C); Models 22-28; 16008, 16009: 0 to 160°F (-18 to 71°C)
Temperature Models	-40 to 160°F (-40 to 71°C). Set point typically shifts less than 1% of range for a 50°F (28°C) ambient temperature change.
SHOCK	Set point repeats after 15 G, 10 millisecond duration
VIBRATION	Set point repeats after 2.5 G, 5-500 CPS
ENCLOSURE CLASSIFICATION	Types C54, C54A, B54, F54, E54, J54, J54A, H54: complies with NEMA 1 requirements. Types C54S, B54S, F54S, E54S, J54S, J54AS, H54S: not applicable
SET POINT REPEATABILITY	
Pressure Models	Models 22-28, 16008-16009, 126-164: ± 1% of full scale range; Models 610-614: ± 1.5% of full scale range
Temperature Models	± 1% of full scale range
SWITCH OUTPUT	One or two SPDT snap action switch(es); dual switch may be separated up to 100% of range; switches may be wired "normally open" or "normally closed"
ELECTRICAL RATING	15A 125/250/480 VAC resistive except models 16008-16009 – 20A 480/VAC. Electrical switches have limited DC capabilities. Consult UE for additional information.
ENCLOSURE MATERIAL	Lexan® black finish for Types J54, J54A, H54, B54, C54, C54A, E54, F54 only
WEIGHT	Approximately 12 oz.
ELECTRICAL CONNECTION	Types J54 & H54, C54, C54A, B54, E54, F54: 7/8" diameter hole; Type J54A: 1-1/16" diameter hole
PRESSURE CONNECTION	Models 22-28, 16008, 16009: 1/4" NPT (male); 126-164, 610-614: 1/4" NPT (female)
TEMPERATURE ASSEMBLY	Bulb and Capillary: 6 feet copper or 304 stainless steel capillary Immersion Stem: Brass
TEMPERATURE FILL	Non-toxic oil
TEMPERATURE DEADBAND	Typically 1% of range under laboratory conditions (70°F circulating bath at rate of 1/2°F per minute change)

APPROVALS

UNITED STATES AND CANADA

Type J54, J54A, H54
UL Listed, cUL Certified
Pressure: UL 508, CSA C22.2 No. 14, file # E42272

Type J54S, J54AS, H54S
UL Recognized, cUL Recognized
Pressure: UL 508, CSA C22.2 No. 14, file #E42272

Type B54, C54, E54, F54
UL listed, CSA Certified
Temperature: UL 873, file # E10667;
CSA C22.2 No. 0 & 24, file # LR7814

Type B54S, C54S, E54S, F54S
UL Recognized, CSA Certified
Temperature: UL 873, file # E10667;
CSA C22.2 No. 0 & 24, file # LR7814

Canadian Registration Number (CRN): Refer to www.ueonline.com/certifications for list of approved models

EUROPE

Low Voltage Directive (LVD) (2006/95/EC)
UEC compliant to LVD
Products rated lower than 50 VAC and 75 VDC are outside of the scope of the LVD
The Low Voltage Directive does not apply to open frame (skeleton) models.

Pressure Equipment Directive (PED) (97/23/EC)
Compliant to PED
Products rated lower than 7.5 psi are outside the scope of the PED

Lexan® is a registered trademark of SABIC Innovative Plastics

TEMPERATURE MODEL CHART

Model	Adjustable Set Point Range		Max. Temperature		Scale*** Division		Stem Size
	°F	°C	°F	°C	°F	°C	NPT x BT (inches)
B54, B54S, C54, C54S, C54A, C54AS, Brass immersion stem							
103	0 to 225	-17.8 to 107.2	250	121.1	10	5	3/8 x 2-1/8
109	200 to 425	93.3 to 218.3	425	218.3	10	5	3/8 x 2-1/8
							OD x Length
E54, F54, Copper bulb and capillary							
D20BC	-130 to 120	-90 to 48.9	170	76.7	10	5	3/8 x 4-1/2
D21BC	0 to 150	-17.8 to 65.6	200	93.3	5	5	3/8 x 6-7/8
D22BC	50 to 300	10 to 148.9	350	176.7	10	5	3/8 x 4-1/2
D23BC	150 to 650	65.6 to 343.3	700	371.1	25	10	3/8 x 3-5/8
E54, F54, Stainless steel bulb and capillary							
D20BS‡	-130 to 120	-90 to 48.9	170	76.7	10	5	3/8 x 4-1/2
D21BS	0 to 150	-17.8 to 65.6	200	93.3	5	5	3/8 x 6-7/8
D22BS	50 to 300	10 to 148.9	350	176.7	10	5	3/8 x 4-1/2
D23BS	150 to 650	65.6 to 343.3	700	371.1	25	10	3/8 x 3-5/8
E54S, F54S, Copper bulb and capillary							
D21BC	0 to 150	-17.8 to 65.6	200	93.3	5	5	3/8 x 6-7/8
D22BC	50 to 300	10 to 148.9	350	176.7	10	5	3/8 x 4-1/2
D23BC	150 to 650	65.6 to 343.3	700	371.1	25	10	3/8 x 3-5/8
E54S, F54S, Stainless steel bulb and capillary							
D21BS	0 to 150	-17.8 to 65.6	200	93.3	5	5	3/8 x 6-7/8
D22BS	50 to 300	10 to 148.9	350	176.7	10	5	3/8 x 4-1/2
D23BS	150 to 650	65.6 to 343.3	700	371.1	25	10	3/8 x 3-5/8

‡ Not available Type F54

*** Applies to Types B54, B54S, E54, E54S only

HOW TO ORDER

BUILDING A PART NUMBER

Select a **Type**

Refer to the "Type" section below.

Determine type number based on switch output, enclosure, adjustment and reference.

Fill in the type portion of your part number with the corresponding number.

Select a **Model**

Refer to the "Model Charts."

Determine model based on adjustable range, deadband and proof pressure.

Fill in the model portion of your part number with the corresponding number.

Select an **Option**

Refer to the "Options" section.

Determine option number based on switch output, optional materials or other product enhancements.

Fill in the option portion of your part number with the corresponding number.

Leave "option" portion blank if no options are needed. FOR MULTIPLE OPTIONS: Call United Electric Controls.

TYPE	DESCRIPTION - PRESSURE MODELS
J54:	NEMA 1 enclosure; One SPDT output; internal hex adjustment with no reference dial
J54A:	NEMA 1 enclosure; Two SPDT outputs; internal hex adjustment with no reference dial
J54S:	Skeleton construction; One SPDT output; hex adjustment with no reference dial
J54AS:	Skeleton construction; Two SPDT outputs; hex adjustment with no reference dial
H54:	NEMA 1 enclosure; One SPDT output; internal adjustment with reference dial
H54S:	Skeleton construction; One SPDT output; adjustment with reference dial
	TEMPERATURE MODELS
C54:	NEMA 1 enclosure; Immersion stem; one SPDT output; internal hex adjustment with no reference dial
C54A:	NEMA 1 enclosure; Immersion stem; two SPDT outputs; internal hex adjustment with no reference dial
C54S:	Skeleton construction; Immersion stem; one SPDT output; hex adjustment with no reference dial
C54AS:	Skeleton construction; Immersion stem; Two SPDT outputs; hex adjustment with no reference dial
B54:	NEMA 1 enclosure; Immersion stem; one SPDT output; internal adjustment with reference dial
B54S:	Skeleton construction; Immersion stem; one SPDT output; adjustment with reference dial
F54:	NEMA 1 enclosure; Bulb and capillary; one SPDT output; internal hex adjustment with no reference dial
F54S:	Skeleton construction; Bulb and capillary; one SPDT output; hex adjustment with no reference dial
E54:	NEMA 1 enclosure; Bulb and capillary; one SPDT output; internal adjustment with reference dial
E54S:	Skeleton construction; Bulb and capillary; one SPDT output; adjustment with reference dial

SWITCH OPTIONS*

CODE	DESCRIPTION
0140	Gold contacts, 1A 125 VAC resistive. NOT AVAILABLE ON MODELS 16008-16009.
0500	Close deadband, 5A 125/250 VAC resistive. NOT AVAILABLE ON B54, J54A, B54S, C54, C54S, C54A, C54AS, E54S, F54, F54S, AND MODELS 16008-16009.
1520	Adjustable deadband, 15A 125/250/480 VAC resistive. Adjustable wheel changes rise setting only. If adjustment of fall setting is required, use primary adjustment. NOT AVAILABLE ON TYPES J54A, J54AS, H54, H54S, PRESSURE MODELS 610-614, 16008-16009 & TEMPERATURE VERSIONS
1530	External manual reset, 15A 125/250/480 VAC resistive; reset on increasing pressure or temperature only. NOT AVAILABLE ON TYPES J54A, J54S, J54AS, H54S,B54S, C54A, C54AS, C54S, E54S, F54S OR MODELS 610-614, 16008-16009
2000	20A 125/250/480 VAC resistive. NOT AVAILABLE ON MODELS 16008-16009.

** All switches have limited DC capabilities. Consult factory for details.*

GENERAL OPTIONS

CODE	DESCRIPTION
M201	Factory set one switch; specify increasing or decreasing pressure or temperature and set point. NOT AVAILABLE ON TYPES J54A, J54AS, C54A, C54AS AND MODELS 16008-16009.
M202	Factory set two switches; specify increasing or decreasing pressure or temperature and set point. NOT AVAILABLE ON TYPES J54, J54S, H54, H54S, B54, B54S, C54, C54S, E54, E54S, F54, F54S
M270	Calibrated dial in Celsius. NOT AVAILABLE ON PRESSURE VERSIONS AND TYPES B54, B54S, C54, C54S, C54A, C54AS, F54, F54S
M277	Range indicated on nameplate in kPa or MPa. NOT AVAILABLE ON TEMPERATURE VERSIONS AND MODELS 16008-16009.
M278	Range indicated on nameplate in kg/cm2. NOT AVAILABLE ON TEMPERATURE VERSIONS AND MODELS 16008-16009.
M444	Paper ID tag. NOT AVAILABLE MODELS 16008-16009.
M446	Stainless steel ID tag & wire attachment. NOT AVAILABLE MODELS 16008-16009.
M540	Viton® construction (deadband and low end range may increase slightly. Consult factory); Wetted parts include Viton® diaphragm and O-Ring plus standard connection material. NOT AVAILABLE MODELS 126-164, 16008-16009 OR TEMPERATURE VERSIONS

PRESSURE CONNECTION OPTIONS

M501	Polysulfone® pressure connection 1/2" NPT (male) x 1/8" NPT (female). NOT AVAILABLE MODELS 126-164, 610-614, 16008-16009 OR TEMPERATURE VERSIONS

OPTIONS FOR TEMPERATURE MODELS

UNION CONNECTORS

For all bulb & capillary switches

Option	Replacement Number	Description
	Brass	
W027	SD6213-27	1/2 " NPT w/ 3/4" bushing
W045	SD6213-45	3/4" NPT
W051	SD6213-51	1/2" NPT
	304 Stainless Steel	
W028	SD6213-28	1/2" NPT w/ 3/4" bushing
W046	SD6213-46	3/4" NPT
W050	SD6213-50	1/2" NPT

THERMOWELLS

For all bulb & capillary switches

	Brass	
W075	SD6225-75	3/4" bushing adapter, 4" BT
W191	SD6225-191	1/2" NPT, 4" BT
W118	SD6225-118	3/4" bushing adapter, 7" BT
W192	SD6225-192	1/2" NPT, 7" BT
	316 Stainless Steel	
W076	SD6225-76	3/4" NPT, 4.5" BT
W193	SD6225-193	1/2" NPT, 4.5" BT
W119	SD6225-119	3/4" NPT, 7.5" BT
W177	SD6225-177	1/2" NPT, 7.5" BT
For all Immersion stem switches		
W141	SD6225-141	1/2" NPT x 1 9/16" BT, brass
W146	SD6225-146	1/2" NPT x 1 9/16" BT, 316 stainless steel

OPTIONAL LENGTHS:

Optional immersion stem lengths to 15" may be available in brass, with or without 316 st/st thermowell. Consult UE for availability.
Optional capillary length to *50' may be available in copper or 304 st/st. Consult UE for availability.
Armor or Teflon® capillary protection may be available to lengths less than or equal to capillary length. Consult UE for availability.

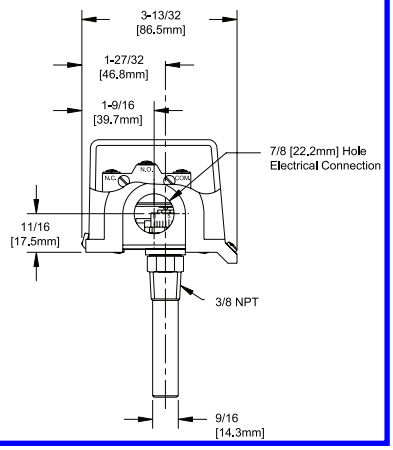
**Consult UE regarding repeatability and ambient effects on capillary lengths over 30'.*
Viton® is a registered trademark of E.I. duPont Nemours and Company.

54 Series

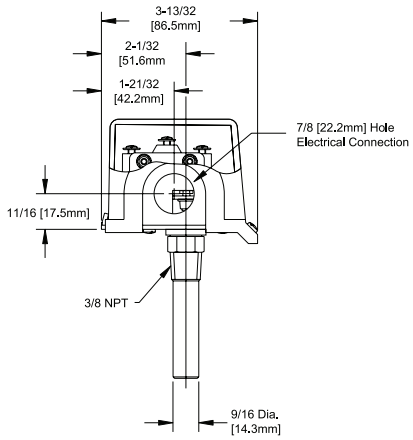
DIMENSIONAL DRAWINGS

Temperature Models

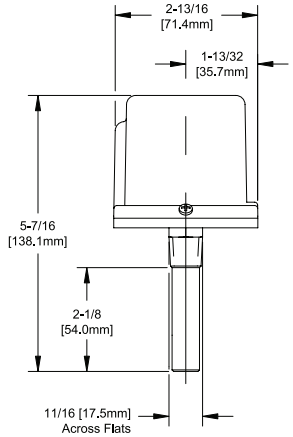
Types B54, C54



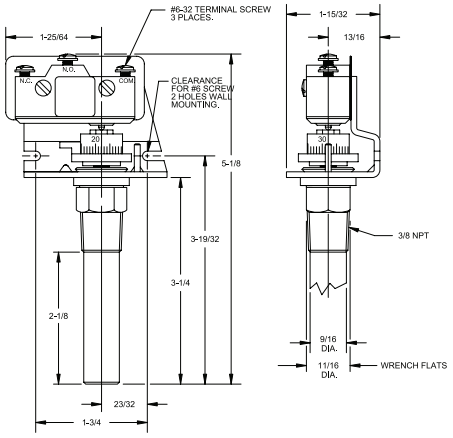
Type C54A



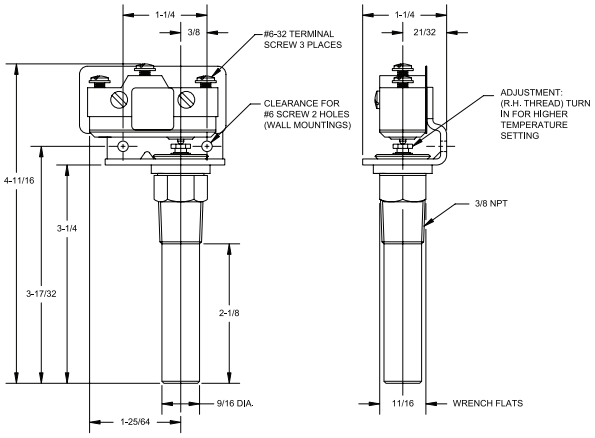
Types B54, C54, C54A



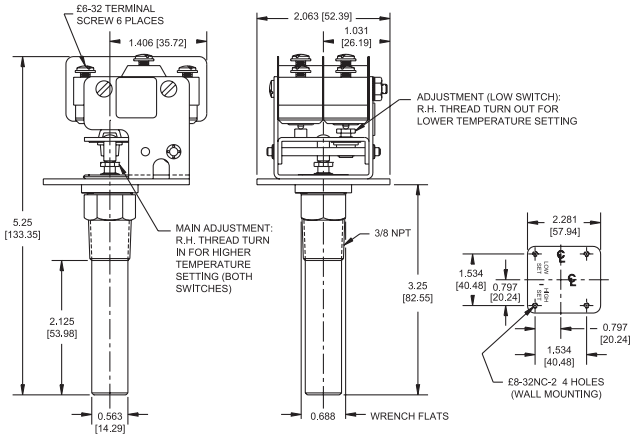
Type B54S



Type C54S



Type C54AS



All dimensions stated in inches (millimeters)

RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

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- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 24 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

Seller's liability to Buyer for any loss or claim, including liability incurred in connection with (i) breach of any warranty whatsoever, expressed or implied, (ii) a breach of contract, (iii) a negligent act or acts (or negligent failure to act) committed by Seller, or (iv) an act for which strict liability will be inputted to seller, is limited to the "limited warranty" of repair and/or replacement as so stated in our warranty of product. In no event shall the Seller be liable for any special, indirect, consequential or other damages of a like general nature, including, without limitation, loss of profits or production, or loss or expenses of any nature incurred by the buyer or any third party.

UE specifications subject to change without notice.

Be sure to visit www.ueonline.com for the latest information.

FOR A LIST OF OUR INTERNATIONAL AND DOMESTIC REGIONAL SALES OFFICES PLEASE VISIT OUR WEBPAGE WWW.UEONLINE.COM

UNITED ELECTRIC CONTROLS
180 Dexter Avenue, P.O. Box 9143
Watertown, MA 02471-9143 USA
Telephone: 617 926-1000 Fax: 617 926-2568
http://www.ueonline.com

CP07121500



54 Series Temperature Switches

Types
B54, B54S, C54, C54S, C54A, C54AS, E54, E54S, F54, F54S

UNITED ELECTRIC CONTROLS

Installation and Maintenance Instructions

Please read all instructional literature carefully and thoroughly before starting. Refer to the final page for the listing of Recommended Practices, Liabilities and Warranties.

GENERAL

Type B54, B54S, C54, C54S, C54A, C54AS (Immersion Stem)
Temperature variations are sensed by a liquid filled sensor which expands or contracts against a bellows which actuates a snap-action switch at a predetermined set point.

Type E54, E54S, F54, F54S (Bulb & Capillary)
Temperature variations of a liquid filled sensing bulb are hydraulically transmitted to a diaphragm which actuates a snap-acting switch at a predetermined set point.

MAXIMUM TEMPERATURE* STATED IN LITERATURE AND ON NAMEPLATE MUST NEVER BE EXCEEDED, EVEN BY SURGES IN THE SYSTEM. OCCASIONAL OPERATION OF UNIT UP TO MAX. TEMPERATURE IS ACCEPTABLE (E.G., START-UP, TESTING). CONTINUOUS OPERATION SHOULD BE RESTRICTED TO THE DESIGNATED ADJUSTABLE RANGE.

*Maximum Temperature - the highest temperature to which a sensing element may be occasionally operated at, without adversely affecting set point calibration and repeatability.

THIS PRODUCT DOES NOT HAVE FIELD REPLACEABLE PARTS.

Please refer to product bulletin for product specifications. Product bulletins may be found at www.ueonline.com.

Part I - Installation

Tools Needed
Screwdriver
Adjustable wrench

MOUNTING

INSTALL UNIT WHERE SHOCK, VIBRATION AND TEMPERATURE FLUCTUATIONS ARE MINIMAL. DO NOT MOUNT UNIT IN AMBIENT TEMPERATURES EXCEEDING PUBLISHED LIMITS. 54 SERIES TEMPERATURE SWITCHES CAN BE MOUNTED IN ANY POSITION, PROVIDED THE ELECTRICAL CONDUIT IS NOT FACING UP. ORIENT UNIT SO THAT MOISTURE IS PREVENTED FROM ENTERING THE ENCLOSURE*.

Remove Cover (Enclosed version only). Cover is held on by one captive screw located on the front of the cover.

54 Series temperature switches can be mounted in any position by using either the Mounting Screw holes on the bracket or the NPT connector on the immersion stem (local mounted only). Optional union connectors or separable well kits are available for remote bulb types.

A 7/8" diameter hole has been provided in the bracket plate for mounting a standard conduit fitting.

FOR LOCAL MOUNTING, ALWAYS HOLD A WRENCH ON THE TEMPERATURE HOUSING HEX WHEN MOUNTING UNIT. DO NOT TIGHTEN BY TURNING ENCLOSURE. THIS WILL DAMAGE SENSOR AND WEAKEN SOLDERED OR WELDED JOINTS.

For remote mounting, fully immerse the bulb and 6" of capillary in the control zone. It is generally desirable to place the bulb close to the heating or cooling source in order to sense temperature fluctuations quickly. Be sure to locate the bulb so that it will not be exposed to temperatures beyond the instrument range limits.

WIRING

DISCONNECT ALL SUPPLY CIRCUITS BEFORE WIRING UNIT. ELECTRICAL RATINGS STATED IN LITERATURE AND ON NAMEPLATE MUST NOT BE EXCEEDED. OVERLOAD ON A SWITCH CAN CAUSE FAILURE ON THE FIRST CYCLE. WIRE UNITS ACCORDING TO NATIONAL AND LOCAL ELECTRICAL CODES. MAXIMUM RECOMMENDED WIRE SIZE IS #14 AWG.

Conduit Connection (Enclosed units only)

FOR ENCLOSED UNITS, CONNECT THE CONDUIT TO THE HOLE IN ACCORDANCE WITH NATIONAL AND LOCAL CODES. BRING WIRES UP TO THE TERMINALS FROM THE REAR. MAXIMUM RECOMMENDED WIRE SIZE - #14 AWG.

Part II - Adjustments

Tools Needed
1/4" Open-ended wrench
1/16" Allen wrench
(single switch calibrated units)

MAKE SURE THAT LIVE ELECTRICAL SUPPLIES TO THE TEMPERATURE SWITCH ARE DISCONNECTED BEFORE PERFORMING ANY DISASSEMBLY. THIS MAY REQUIRE DISCONNECTING MORE THAN ONE CIRCUIT.

Dual Switch Units (C54A, C54AS)

ON DUAL SWITCH UNITS, "LOW SET" SWITCH MUST ALWAYS BE SET EQUAL OR BELOW THE "HIGH SET" SWITCH.

* If applicable

High Set

Immerse the sensing portion of the unit in a calibrated temperature bath or other calibrated source at the desired "Hi Set" temperature. Allow 5 minutes for the thermal system to stabilize. Using a 1/4" open end wrench, slowly turn the main adjustment screw towards the right (counter-clockwise) until the "Hi Set" switch transfers. If switch does not transfer, turn the main adjustment screw towards the left (clockwise) until the switch transfers, and then towards the right until it transfers again. The "Hi Set" switch should now transfer on "temperature rise" at the bath temperature. If it is desired that the switch transfer on "temperature fall" at the bath temperature, turn the main adjustment screw towards the left until the switch transfers again.

Low Set

Lower the temperature of the calibrated bath (or use another bath) to the desired "Low Set" temperature, and allow 5 minutes for the thermal system to stabilize. Using a 1/4" open end wrench, slowly turn the low set adjustment screw towards the left until the switch transfers. If switch does not transfer, turn the low set adjustment screw towards the right until the switch transfers, and then towards the left until it transfers again. The "Low Set" switch is now set to actuate at the bath temperature on "temperature fall". If it is desired that the "Low Set" switch transfer on "temperature rise" at the bath temperature, turn the low set adjustment screw towards the right until the switch transfers.

Fine Adjustment

If it is necessary to "fine adjust" the "High Set" setting, raise the bath temperature to a value slightly higher than the "High Set" temperature. Note the temperature at which the switch transfers (on rise). Lower the bath temperature and note when switch transfers again (on fall). Turn the main adjustment screw towards the left to raise or towards the right to lower the settings.

If necessary, perform the same "fine adjustment" procedure outlined above for the "Low Set" switch.

Single Switch Units

Uncalibrated (C54, C54S, F54, F54S)

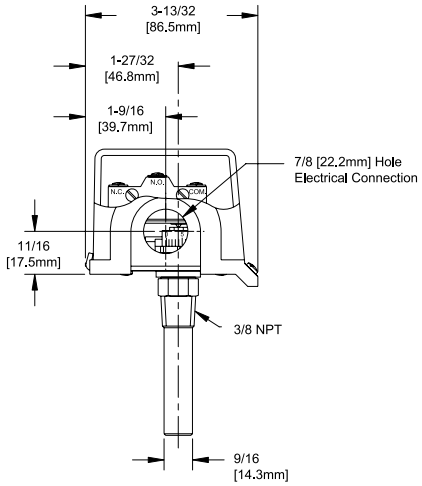
To adjust single switch units, follow "High Set" instructions. For "fine adjustment", follow Fine Adjustments above.

Calibrated (B54, B54S, E54, E54S)

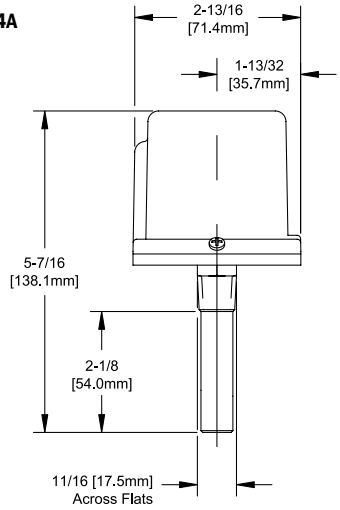
Turn the reference dial to desired set point by aligning setting on dial with dowel pin.

Dimensions

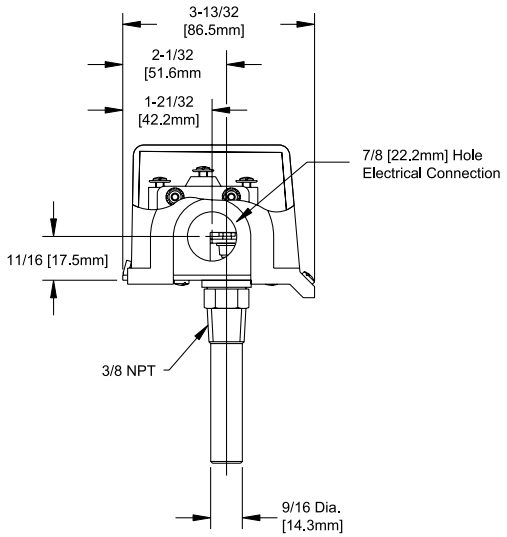
Types B54, C54



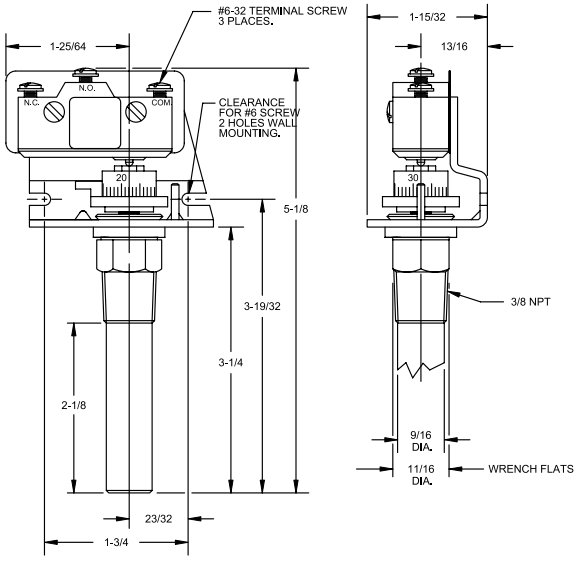
Types B54, C54, C54A



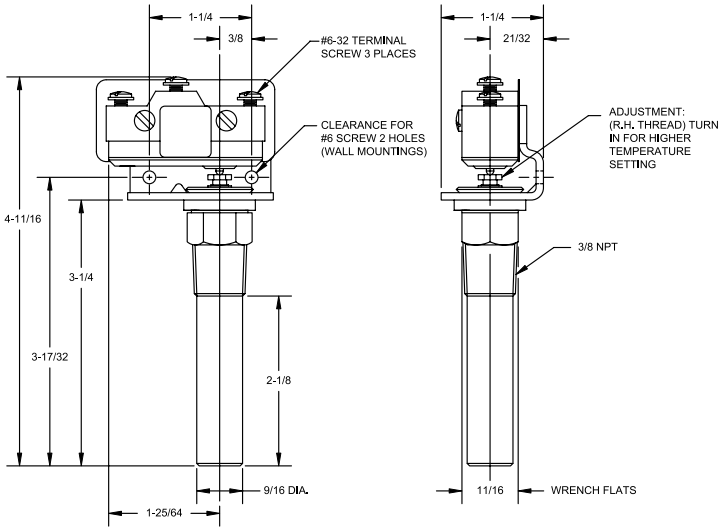
Type C54A



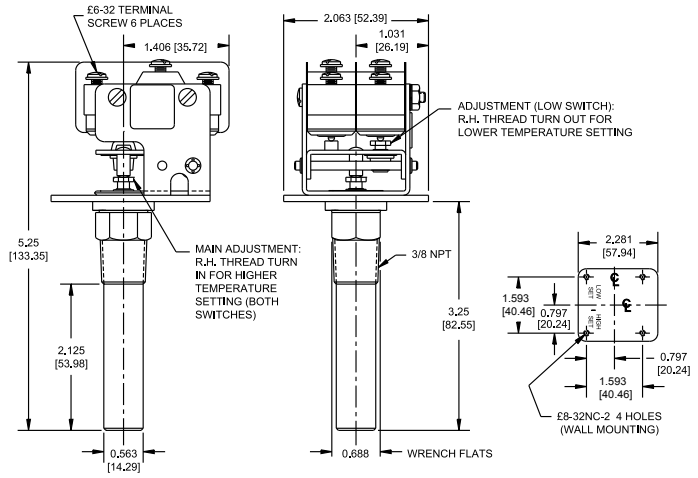
Type B54S



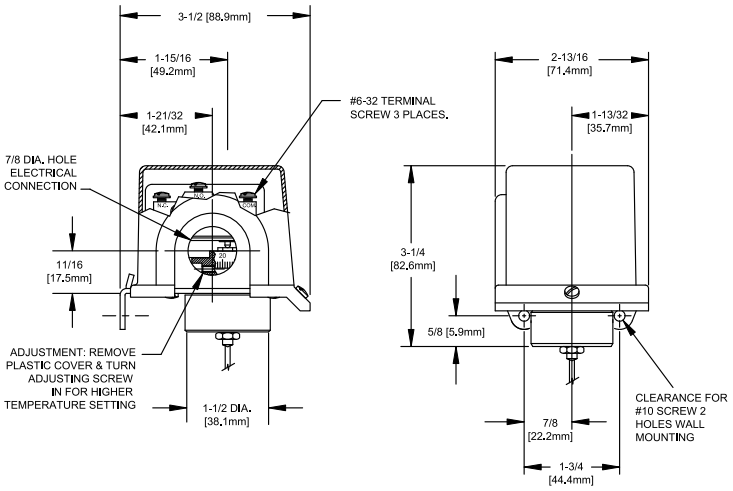
Type C54S



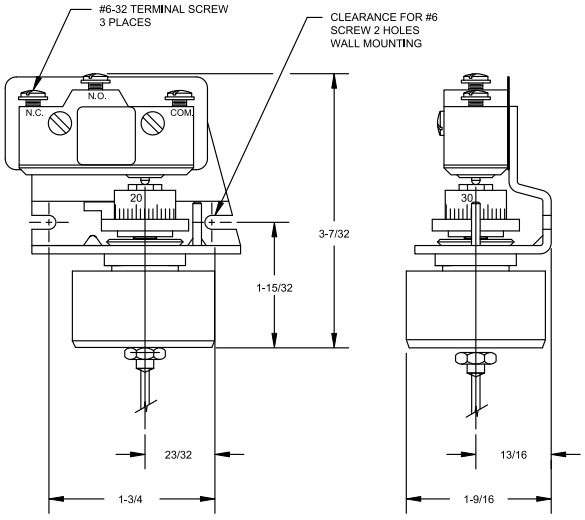
Type C54AS



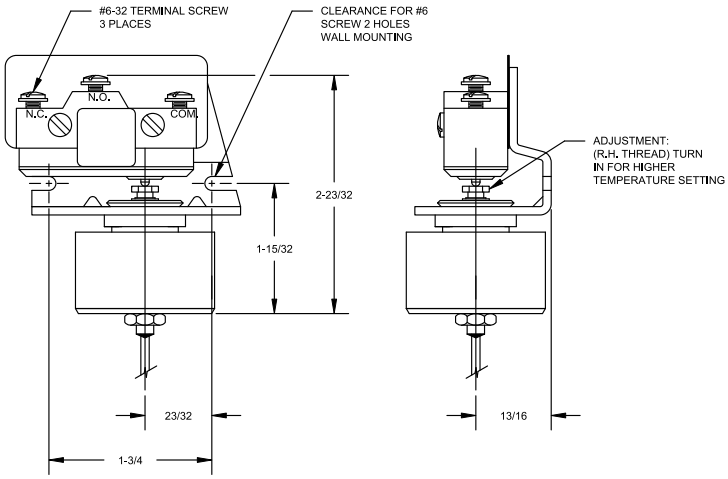
Types E54, F54



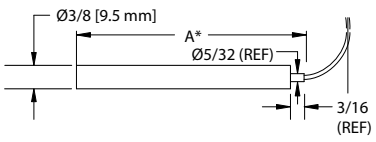
Type E54S



Type F54S



Remote Bulb



* USE DIMENSION "A" FOR SEPERABLE WELL INSTALLATIONS.

Bulb Size		
	Dimension "A"	
Models	Inches	mm
E54 & F54		
D20BC, D20BS, D22BC, D22BS	4.50	114.3
D21BC, D21BS	6.86	174.6
D23BC, D23BS	3.63	92.1
E54S & F54S		
D21BC, D21BS	6.86	174.6
D22BC, D22BS	4.50	114.3
D23BC, D23BS	3.63	92.1

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UNITED ELECTRIC CONTROLS

180 Dexter Avenue, P.O. Box 9143
Watertown, MA 02471-9143 USA
Telephone: 617 926-1000 Fax: 617 926-2568
http://www.ueonline.com

SECTION 6 - ELECTRICAL DRAWINGS & TABLE(S)

SENSAPHONE SENTINEL TELEMETRY INFORMATION

T-2, INTERLOCK TABLE

I-1, CONTROL PANEL LAYOUT DRAWING

T-3, ELECTRICAL PANEL BOM

I-1, CONTROL PANEL WIRING DIAGRAM(S)

T-4, NEC LOAD LIST

E-1, LINE DIAGRAM

E-2, POWER DISTRIBUTION PANEL LAYOUT

NES PROJECT: 19-119 SVE System, July 2019
Parsons / Pine Ave. – Niagara Falls, NY

SENTINEL TELEMETRY SUMMARY & REMOTE ACCESS

AUTOMATIC SERVICE RENEWAL DATE– Sentinel SN 00:07:F9:00:B8:48 Service expires approx. 07-02-2020

ALARMS – SEE INTERLOCK TABLE 2

NORMAL OPERATION
* Equipment will operate if the panel switch is in the AUTO position and no alarm is present.
* Equipment will operate if the panel switch is in the HAND position with or without an alarm condition.
* Conditions that will stop a motor in the hand position are an overload or emergency stop.

SENTINEL PROGRAMMING DETAILS:

Sensaphone Cloud Based Monitoring with Verizon Cellular Service

https://www.sensaphone.net/login

Client Contact / Login Information

Sentinel Cloud Sign in: sara.weishaupt@parsons.com / Password: WA13_PineAve (set up by Parsons / Info to NES for programming the telemetry system.

SENTINEL ALARM SEQUENCE:

Alarm Notifications will be simultaneously sent to Site Contacts as noted above via Text Messaging & Email.

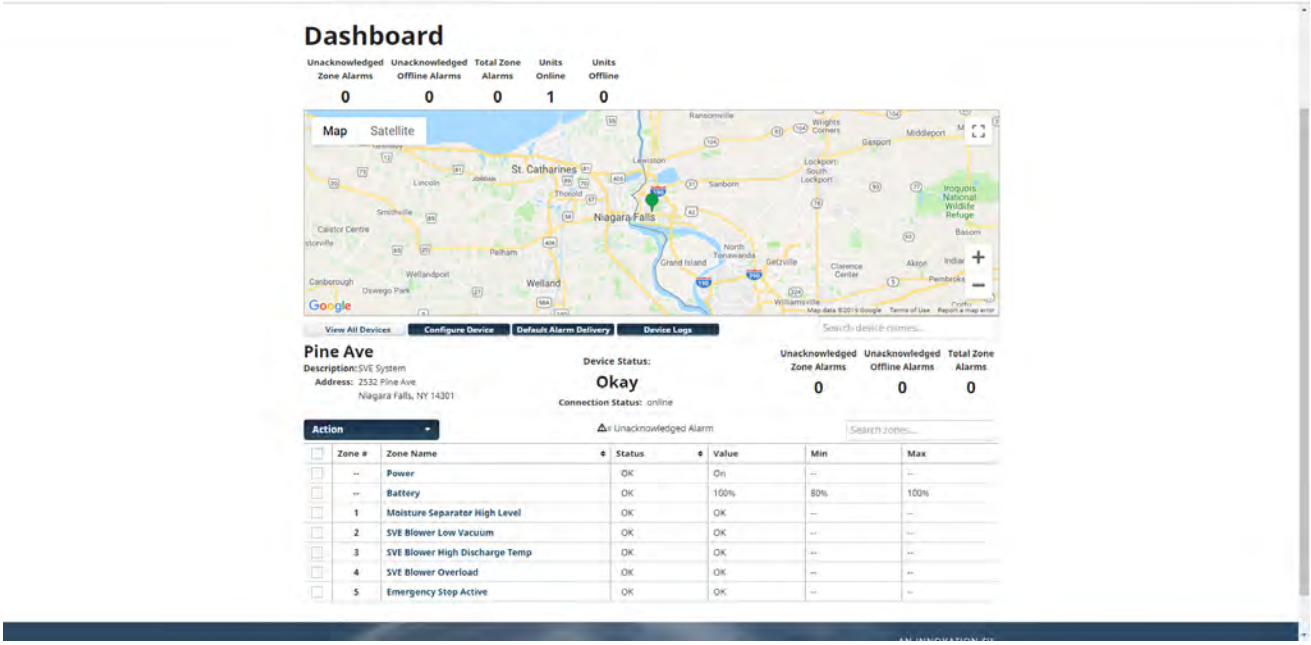
Alarm Notifications will be generated unless the Alarm is acknowledged via the Sentinel Cloud Website or Mobile app available for Android / IPhone

ALARM SOURCE EMAIL(S) FROM: alerts@sensaphone.net

From the Sentinel Dashboard:
- Choose “Action” drop-down box to acknowledge alarms
- Choose “Device Logs” tab to access a summary of alarms

NES PROJECT: 19-119 SVE System, July 2019
Parsons / Pine Ave. – Niagara Falls, NY

SENTINEL TELEMETRY SUMMARY & REMOTE ACCESS



Phone (508) 226-1100 Fax (508) 226-1180 84 Dunham Street Attleboro, MA 02703
www.nes-inc.com

TABLE 2

INTERLOCK SCHEDULE
NES 19-119, REVISION A (JULY 2019) BY: EMB
PARSONS, NY
NYSDEC SITE #932158 / SVE- PINE AVE - NIAGARA FALLS, NY

Interlock	Interlock ID	Interlock Description	B-101, SVE Blower	OPERATOR INTERFACE	Alarm Notification (Local Panel Display)	Sentinel Remote Telemetry Notification	Manual Reset (Warning / Alarm)		INSTRUMENT TYPE	TIME DELAY	NES FACTORY SET POINT	TESTED BY
		Emergency Stop	O		Y	CH.5			D			
1		No alarms present	I									
2	LSHH-101	Moisture Separator (MS-101) Level Switch High High	O		Y	CH.1	Y		D			
3	VSL-101	SVE Blower (B-101) Vacuum Switch Low	O		Y	CH.2	Y		D	10 SEC		
4	TSH-101	SVE Blower (B-101) Discharge Temperature Switch High	O		Y	CH.3	Y		D		150 F	
5	B-101 O/L	SVE Blower (B-101) Overload	O		Y	CH.4	Y		D		2.8 AMPS	
6	PWR_FAILURE	Main Power Failure	O			Y			L			
9	PWR_RESTORE	Main Power Restored				Y			L			

Note:

* System restart delayed 10 seconds upon main power restoration.

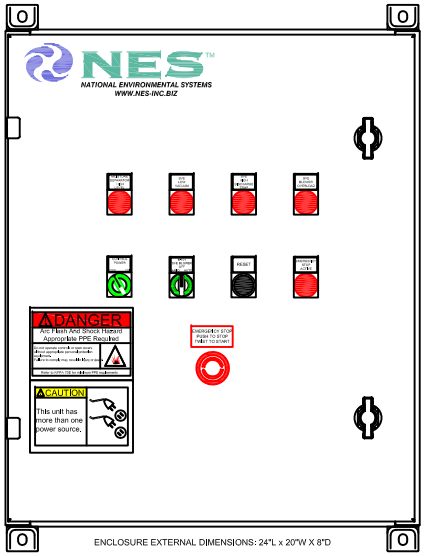
O - Off
I - On

Y - Yes

D - Digital
L - Internal Logic

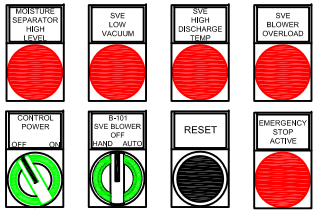
RapidTech LLC d/b/a National Environmental Systems
84 Dunham Street - Attleboro, MA 02703
Phone: (508)226-1100; Fax: (508)226-1180; Email: Info@nes-inc.biz

PANEL EXTERIOR



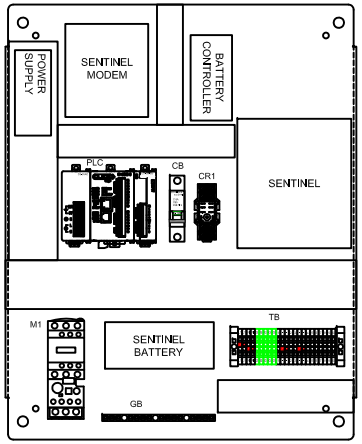
ENCLOSURE EXTERNAL DIMENSIONS: 24"L x 20"W X 8"D

OPERATOR DETAILS





PANEL INTERIOR



LEGEND	
ABBREV.	DESCRIPTION
CB	- CIRCUIT BREAKER
CR	- CONTROL RELAY
GB	- GROUND BAR
M	- MOTOR STARTER
PLC	- PROGRAMMABLE LOGIC CONTROLLER
TB	- TERMINAL BLOCK

NOTES:
1) REFER TO TABLE 3 FOR BILL OF MATERIALS.
2) LOCAL CONTROL PANEL IS UL 508A LISTED.
3) GROUND IN ACCORDANCE WITH N.E.C. ARTICLE 250.122 & LOCAL AUTHORITY HAVING JURISDICTION.

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	AS BUILT	07-26-19	EMB

CONFIDENTIALITY NOTICE:
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DRWN BY EMB DATE 06-20-19
CHK BY DATE
APPR BY DATE

NES
NATIONAL ENVIRONMENTAL SYSTEMS
84 DUNHAM STREET / ATTLEBORO, MA 02703
508-226-1100 (Phone) / 508-226-1180 (Fax)
WWW.NES-INC.COM

TITLE
CONTROL PANEL INTERIOR / EXTERIOR LAYOUT

PARSONS / NYSDEC SITE ID #932158
SVE SYSTEM - PINE AVE - NIAGARA FALLS, NY

JOB NO. 19-119

SCALE	SIZE	DWG NO.	SHEET	REV
NTS	C	I-1	1 OF 1	A

TABLE 3
PANEL BILL OF MATERIALS

REV A JULY 2019

19-119 PARSONS - NYSDEC SITE ID #932158 / SVE- PINE AVE - NIAGARA FALLS, NY

TAG	QUANTITY	ITEM	MODEL	MANUFACTURER
		SECTION 7 -POWER DISTRIBUTION COMPONENTS		
DP	1	DIST. PANEL 125 AMP RATING, SINGLE PHASE, NEMA 3R 12 SLOT	QO112L125GRB	SQUARE D
CB	1	MAIN CIRCUIT BREAKER, 30A, 2-POLE, 120/240 VAC, 1-PHASE, 10KA	QO230	SQUARE D
CB	1	SVE BLOWER CIRCUIT BREAKER 15A 2P	QO215	SQUARE D
CB	1	HEATER CIRCUIT BREAKER 15A 2P	QO215	SQUARE D
CB	4	ACCESSORY CIRCUIT BREAKER(S) 15A 1P	QO115	SQUARE D
GB	1	LOAD CENTER GROUND BAR 15 TERMINALS	PK15GTA	SQUARE D
		SECTION 8 - CONTROL PANEL COMPONENTS		
TELEMETRY	1	SENTINEL TELEMETRY SYSTEM - VERIZON	SCD-1200-4GVZZ	SENSAPHONE
TELEMETRY	1	WIRELESS MODEM 3G / 4G / LTE EXTERNAL ANTENNA - 16 FT CABLE	FGD-0261	SENSAPHONE
ENCL	1	ENCLOSURE NEMA4 24 X 20 X 8 - MILD STEEL/LIGHT GRAY	SCE-24EL2008LP	SAGINAW
ENCL	1	BACK-PANEL 24 X 20 MILD STEEL/WHT	SCE-24P20	SAGINAW
ENCL	1	MOUNTING FEET SET OF 4 - ZINC PLATED	SCE-ELMFK4	SAGINAW
ENCL	2	PANEL WING-KNOB PAD-LOCKING HANDLE BLACK	SCE-PLWKB	SAGINAW
CR	1	RELAY DPDT 120VAC W/INDICATOR LIGHT	RH2B-UL-AC120V	IDEC
CR	1	SOCKET DIN RAIL/SURFACE 8-BLADE FOR RH2B	SH2B-05	IDEC
PLC	1	1.3AMP AC SYSTEM POWER SUPPLY NO POWER BUDGET	C0-01AC	ADI
PLC	1	PLC, 8 DC IN / 6 RELAY OUT, 24VDC POWER	C0-10DRE-D	ADI
PLC	2	8PT 6-240VAC/6-27VDC RELAY OUTPUT 1A 2 ISOLATED COMMONS	C0-08TR	ADI
CB	1	CIRCUIT BREAKER 6A 1-POLE 120/240 VAC 1-PHASE 10KA DIN-MOUNT	MG24430	SQUARE D
M1	1	MOTOR STARTER CONTACTOR 3PST-NO 120VAC 20A DIN RAIL	LC1D09G7	SQUARE D
M1	1	MOTOR STARTER OVERLOAD RELAY, 3-PHASE, 2.5 - 4 AMPS	LRD08	SQUARE D
ESTOP	1	MUSHROOM SWITCH RED TRIGGER ACTION - TURN TO RELEASE	ZB5AS844	SQUARE D
SW	1	3 POS SELECTOR SWITCH ILLUM. GREEN MOMENTARY	ZB5AK1733	SQUARE D
SW	1	2 POS SELECTOR SWITCH ILLUM. GREEN MAINTAINED	ZB5AK1233	SQUARE D
LT	2	MOUNTING BASE120V GREEN PROTECTED LED	ZB5AVG3	SQUARE D
LT	5	PILOT LIGHT HEAD RED LED	ZB5AV043	SQUARE D
PB	1	PUSH BUTTON OPERATOR NON-ILLUM BLACK	ZB5AA2	SQUARE D
PB	2	MOUNTING COLLAR LATCH PB	ZB5AZ009	SQUARE D
LT	5	MOUNTING BASE 120V RED PROTECTED LED	ZB5AVG4	SQUARE D
SW	5	CONTACT BLOCK 1-N.O. SCREW CLAMP	ZBE101	SQUARE D
SW	1	CONTACT BLOCK 1-N.C. SCREW CLAMP	ZBE102	SQUARE D
TB	2	TERMINAL BLOCK END ANCHORS	NSYTRAABV35	SQUARE D
TB	1	TERMINAL BLOCK END BARRIERS GRAY	NSYTRAC22	SQUARE D
TB	18	TERMINAL BLOCK SCREW CLAMP 20 AMP 600 V GRAY	NSYTRV22	SQUARE D
TB	5	TERMINAL BLOCK GROUND SCREW CLAMP 20 AMP 600 V GREEN	NSYTRV22PE	SQUARE D
PB	8	LEGEND PLATE HOLDER	ZBZ33-	SQUARE D
PB	8	BLANK PLATE LARGE BLACK/RED	ZBY5101	SQUARE D
GB	1	LOAD CENTER GROUND BAR 15 TERMINALS	PK15GTA	SQUARE D

PLC WIRING

OUTPUTS ADDR: Y101-Y108

C0-08TR

C1	40		
1	41	AD CH1 1 G	MOISTURE SEPARATOR HIGH LEVEL ALARM
2	42	AD CH2 2 G	SVE LOW VACUUM ALARM
3	43	AD CH3 3 G	SVE HIGH DISCHARGE TEMPERATURE ALARM
4	44	AD CH4 4 G	SVE BLOWER OVERLOAD ALARM
C2	40		
5	45	AD CH5 5 G	EMERGENCY STOP ACTIVE ALARM
6	46	AD CH6 6 G	SPARE
7	47	AD CH7 7 G	SPARE
8	48	AD CH8 8 G	SPARE

PLC

INPUTS ADDR: X001-X008 — C0-10DRE-D — OUTPUTS ADDR: Y001-Y006

	28	C1	C3	30	
RESET	GRY 31	X1	Y1	11	SVE BLOWER (B-101)
EMERGENCY STOP RELAY (CR1B 10/6)	GRY 32	X2	Y2	12	MOISTURE SEPARATOR HIGH LEVEL
SVE BLOWER RUN SIGNAL (M1 AUX 13/14)	GRY 33	X3	Y3	13	SVE LOW VACUUM
SVE BLOWER OVERLOAD SIGNAL (M1 OL 97/98)	GRY 34	X4	Y4	14	SVE HIGH DISCHARGE TEMPERATURE
		C2	C4	30	
MOISTURE SEPARATOR LEVEL SWITCH HIGH-HIGH (LSHH-101)	GRY 35	X5	Y5	15	SVE RUN
SVE VACUUM SWITCH LOW (VSL-101)	GRY 36	X6	Y6	16	SVE OVERLOAD
SVE DISCHARGE TEMPERATURE SWITCH HIGH (TSH-101)	GRY 37	X7	NC	30	
SPARE	GRY 38	X8		5 / 9	CR1A
		NC			

(UNDER UNIT) 24V 0V G

24VDC

28 BLU

29 WHT / BLU

28 BLU / 29 WHT / BLU → PLC POWER SUPPLY

E-STOP ON PANEL

5	R X1 X2	EMERGENCY STOP ACTIVE
4	CR1 14/13	EMERGENCY STOP RELAY
	G X1 X2	CONTROL POWER

OFF / ON (2)

CB1 6 AMP

SENTINAL POWER SUPPLY (1)

120 VAC — L1 — N

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WWW.NES-INC.COM

DRWN BY EMB	DATE 06-20-19	TITLE: WIRING DIAGRAM
CHK BY	DATE	PARSONS / NYSDEC SITE ID #932158 SVE SYSTEM - PINE AVE - NIAGARA FALLS, NY — JOB NO. 19-119
APPR BY --	DATE --	SCALE NTS — SIZE B — DWG NO. I-2 — SHEET 1 OF 2 — REV A

REV	DESCRIPTION	DATE	APPROVED
A	AS BUILT	07-26-19	EMB

REVISIONS

SENTINAL TELEMETRY

N2 WHT

SENTINEL

AUTODIALER

RELAY OUTPUT

NC

C

CH 12			SPARE
CH 11			SPARE
CH 10			SPARE
CH 9			SPARE
CH 8	48	PLC CARD1 CH8 8 C2	SPARE
CH 7	47	PLC CARD1 CH7 7 C2	SPARE
CH 6	46	PLC CARD1 CH6 6 C2	SPARE
CH 5	45	PLC CARD1 CH5 5 C2	EMERGENCY STOP ACTIVE
CH 4	44	PLC CARD1 CH4 4 C1	SVE BLOWER MOTOR OVERLOAD
CH 3	43	PLC CARD1 CH3 3 C1	SVE HIGH DISCHARGE TEMPERATURE
CH 2	42	PLC CARD1 CH2 2 C1	SVE BLOWER LOW VACUUM
CH 1	41	PLC CARD1 CH1 1 C1	MOISTURE SEPARATOR HIGH LEVEL
G	40		

ALL (G) POINT ON UNIT CONNECTED INTERNALLY

POWER

ETHERNET JACK

TO ANTENNA

WIRELESS MODEM

TO CIRCUIT BREAKER IN PANEL

CHARGE CONTROLLER

120V POWER SUPPLY

BATTERY BACK-UP

REV	DESCRIPTION	DATE	APPROVED
A	AS BUILT	07-26-19	EMB

REVISIONS

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DRWN BY EMB DATE 06-20-19

CHK BY DATE

APPR BY DATE

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TITLE

WIRING DIAGRAM

PARSONS / NYSDEC SITE ID #932158
SVE SYSTEM - PINE AVE - NIAGARA FALLS, NY

JOB NO. 19-119

SCALE	SIZE	DWG NO.	SHEET	REV
NTS	B	I-2	2 OF 2	A

TABLE 4
240 SINGLE PHASE

ELECTRICAL LOAD CALCULATION COMMERCIAL BUILDING 240 V, SINGLE PHASE
2017 NATIONAL ELECTRICAL CODE

Customer:	Parsons	Serial #	19-119
Project:	SVE - Pine Ave Niagara Falls, NY	Revision A	JULY 2019 EMB

A. Lighting Loads

1. Interior continuous lighting load

	sq. ft. x		VA/sq. ft. x 125%=	0	VA

Interior noncontinuous lighting load

56	sq. ft x	3	VA/sq. ft =	168	VA

Use actual lighting load if greater

	VA actual continuous x 125% =	0	VA
168	VA actual noncontinuous =	168	VA

2. Exterior lighting load

	VA x		fixtures x 125%=	0	VA

B. Receptacle Loads

1. Noncontinuous duty:

	Number of receptacles x 180 VA=	0	VA

2. Continuous Duty

	Number of receptacles x 180 VA x 125%	0	VA

C. Heating, A/C and Motor loads

1. Larger of heating or A/C load

2000	VA x	125%=		2500	VA

Continuous motor loads

1127	Total VA x 125%=	1408.75	VA
	Noncontinuous motor load VA=	0	VA

D. Largest Motor Load

1. Largest motor load from C above x 25 %

1127	VA x 25%=	281.75	VA

E. Additional Loads

1. Nameplate VA ratings for additional continuous loads

720	Total VA x 125%=	900	VA

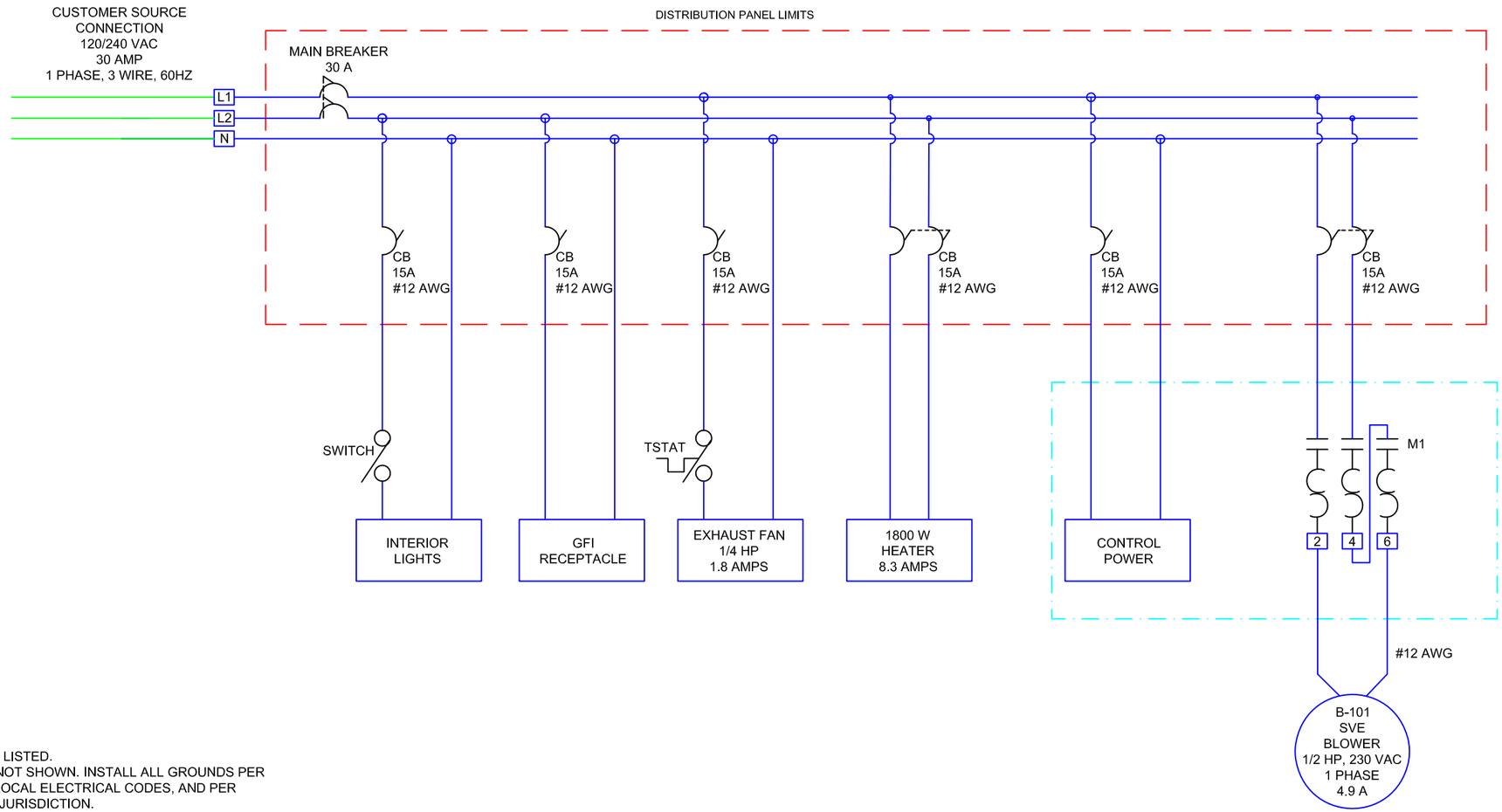
2. Nameplate VA rating for additional noncontinuous loads

	Total VA=	0	VA

Total VA =	5258.5	VA
Total amps =	22	A

Electrical Service Connection **30** amps is suitable

A continuous load is a load where maximum current is expected for 3 or more hours



NOTES:
1. CONTROL PANEL UL 508A LISTED.
2. GROUND CONDUCTORS NOT SHOWN. INSTALL ALL GROUNDS PER NEC ARTICLES 250.122 , LOCAL ELECTRICAL CODES, AND PER THE AUTHORITY HAVING JURISDICTION.

LEGEND	
ABBREV.	DESCRIPTION
CB	CIRCUIT BREAKER
TSTAT	THERMOSTAT
AWG	AMERICAN WIRE GAUGE
M	MOTOR STARTER
———	CUSTOMER CONNECTION
- - - -	DISTRIBUTION PANEL LIMIT
-·-·-	CONTROL PANEL LIMIT

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	AS BUILT	07-26-19	EMB

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DATE	06-19-19
CHK BY	
DATE	
APPR BY	
DATE	

TITLE: LINE DIAGRAM

PARSONS / NYSDEC SITE ID #932158
SVE SYSTEM - PINE AVE - NIAGARA FALLS, NY

JOB NO. 19-119

SCALE	SIZE	DWG NO.	SHEET	REV
NTS	B	E-1	1 OF 1	A

SINGLE PHASE DISTRIBUTION PANEL
120/240 VAC, 30 AMP, 3 WIRE

MAIN	2P30A	1	2	1P15A	CONTROL POWER
		3	4	1P15A	INTERIOR LIGHTS
B-101 SVE BLOWER	2P15A	5	6	1P15A	EXHAUST FAN
		7	8	1P15A	GFI RECEPTACLE
		9	10	2P15A	HEATER
		11	12		

REV	DESCRIPTION	DATE	APPROVED
A	AS BUILT	07-26-19	EMB

REVISIONS

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DRWN BY EMB DATE 06-21-19
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TITLE
POWER DISTRIBUTION PANEL LAYOUT

PARSONS / NYSDEC SITE ID #932158
SVE SYSTEM - PINE AVE - NIAGARA FALLS, NY

JOB NO. 19-119
SCALE NTS
SIZE B
DWG NO. E-2
SHEET 1 OF 1
REV A

SECTION 7 -POWER DISTRIBUTION COMPONENTS

DIST. PANEL 125 AMP RATING, SINGLE PHASE, NEMA 3R 12 SLOT - SQUARE D QO112L125GRB

Product data sheet
Characteristics

QO112L125GRB
LOAD CENTER QO MLO 240V 125A 1PH 12SP

Product availability: Stock - Normally stocked in distribution facility

Price*: 285.00 USD



Main

Product or component type	Load Center
Range of product	QO
Load center type	Main lugs
Line Rated Current	125 A
Number of spaces	12
Short-circuit current	65 kA
Number of circuits	12
Number of tandem circuit breakers	0
Phase	1 phase
System Voltage	120/240 V AC

Complementary

AWG gauge	AWG 6...AWG 2/0 (aluminium/copper)
NEMA degree of protection	NEMA 1 indoor
Cover type	Surface cover
Electrical connection	Lugs
Device composition	Grounding bar included (not installed)
Electrical connection	Lugs
Wiring configuration	3-wire
Material	Tin plated copper busbar
Enclosure material	Welded galvannealed steel
Surface finish	Baked enamel grey
Box number	3R
Product certifications	UL listed
Height	481 mm
Width	14.76 in (375 mm)

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein.
This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications.
It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof.
Neither Schneider Electric Industries SAS nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. *Prices are indicative

Ordering and shipping details

Category	00002 - QO 1PH LC,12-42 CKT,NEMA3R
Discount Schedule	DE3A
GTIN	00785901867852
Nbr. of units in pkg.	1
Package weight(Lbs)	20.600000000000001
Returnability	Y
Country of origin	US

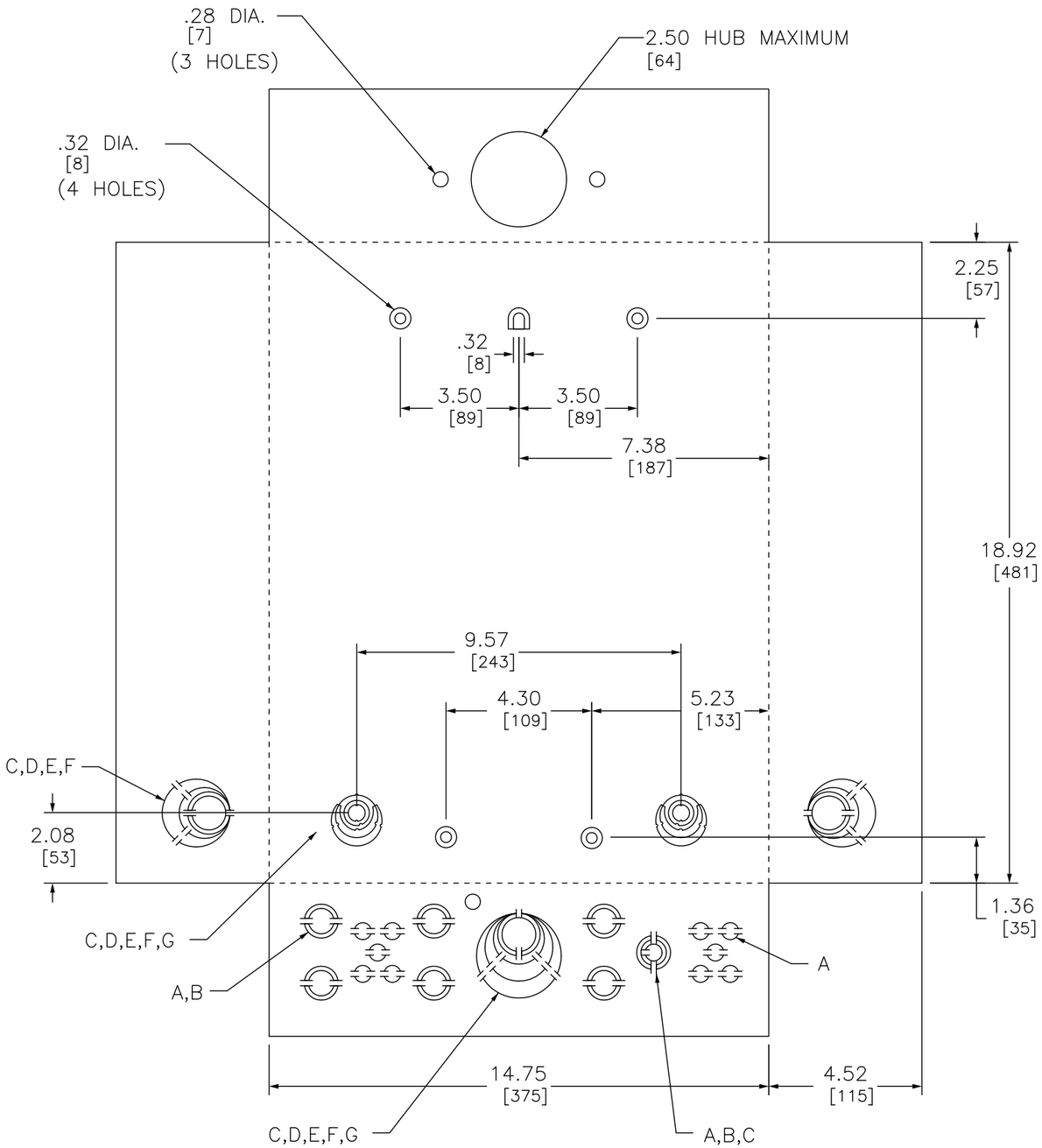
Offer Sustainability

RoHS (date code: YYWW)	Compliant - since 1248 - Schneider Electric declaration of conformity Schneider-Electric declaration of conformity
REACh	Reference not containing SVHC above the threshold
Product end of life instructions	Need no specific recycling operations
California proposition 65	WARNING: This product can expose you to chemicals including:
- - - - - - - Substance 1	Lead and lead compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm.
- - - - - - - More information	For more information go to www.p65warnings.ca.gov

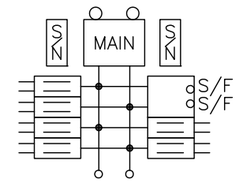
Contractual warranty

Warranty period	18 months

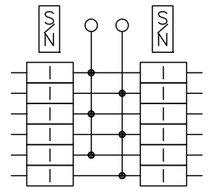
Product Life Status : Commercialised



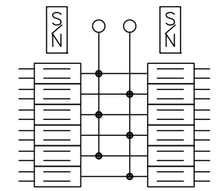
KNOCKOUTS							
SYMBOL	A	B	C	D	E	F	G
IN	.50	.75	1.00	1.25	1.50	2.00	2.50
MM	13	19	25	32	38	51	64



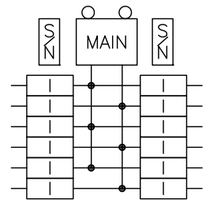
QO1612M125FTRB



QO112L125GRB



QO11224L125GRB



QO112M100RB

DUAL DIMENSIONS: INCHES
MILLIMETERS

CATALOG NUMBER	MAXIMUM SYSTEM VOLTAGE	MAINS AMPERE RATING	SPACES	MAXIMUM NUMBER OF SINGLE POLE CIRCUITS	MAIN WIRE SIZE AWG AL/CU
QO11224L125GRB	120/240VAC 1Ø 3W	125	12	24	#4–2/0
QO112L125GRB		125	12	12	
QO112M100RB		100	12	12	
QO1612M125FTRB		125	6	12	

NOTES:
FINISH – GRAY BAKED ENAMEL ELECTRODEPOSITED OVER CLEANED PHOSPATIZED STEEL.
UL LISTED – FILE E–6294
NEUTRALS – INSULATED GROUNDABLE.
LOAD CENTERS WITH "G" IN CATALOG NUMBER INCLUDE A FIELD INSTALLABLE EQUIPMENT GROUND BAR KIT.
WHEN MOUNTING THESE LOAD CENTERS, ALLOW 1.25 INCHES OF CLEARANCE ON HINGED SIDE FOR THE DOOR TO OPEN

QO LOAD CENTERS
RAINPROOF NEMA TYPE 3R ENCLOSURE
SIDE HINGED
INDOOR

SQUARE D™
by Schneider Electric

DWG# NO. 3013

SECTION 8 - CONTROL PANEL COMPONENTS

SENTINEL TELEMETRY SYSTEM - VERIZON - SENSAPHONE SCD-1200-4GVZZ

WIRELESS MODEM 3G / 4G / LTE EXTERNAL ANTENNA - 16 FT CABLE - SENSAPHONE FGD-0261

ENCLOSURE NEMA4 24 X 20 X 8 - MILD STEEL/LIGHT GRAY - SAGINAW SCE-24EL2008LP

PLC, 8 DC IN / 6 RELAY OUT, 24VDC POWER - ADI C0-10DRE-D

8PT 6-240VAC/6-27VDC RELAY OUTPUT 1A 2 ISOLATED COMMONS - ADI C0-08TR

MUSHROOM SWITCH RED TRIGGER ACTION - TURN TO RELEASE - SQUARE D ZB5AS844

SENSAPHONE®
REMOTE MONITORING SOLUTIONS



Sentinel
Technical Specifications

ALARM NOTIFICATION METHODS:

E-Mail, Text Messages, Voice Phone Calls

Programmable alarm escalation levels

Comprehensive scheduling per input, profile, and alarm destination

Unlimited number of User Profiles

Multiple contact types per user

INPUTS:

12 Universal Inputs

- Normally Open / Normally Closed Dry Contact
- 2.8K / 10K Thermistor
- 4-20mA Current Loop
- Pulse Count
- 12 Bit Resolution

TEMPERATURE SENSING RANGE:

-109° to 168°F | -85° to 76°C

RELAY OUTPUT:

Programmable. Rated for 1A 30VAC/ 1A 30VDC

DATA LOGGING:

Unlimited samples securely stored on the Sentinel servers

Programmable sampling interval - 1 min to 24 hrs

User programmable channel selection

COMMUNICATION PORTS:

Ethernet 10/100Base–T

BATTERY BACKUP:

4.8V 2000mAHr NiMh Battery pack (included)

Provides 8 hours of backup

LOCAL INDICATORS:

12 Alarm Status LEDs

- Power LED • Online LED
- Standby LED • Ethernet link and Activity LEDs

POWER REQUIREMENTS:

Comes with 12VDC plug-in power supply.

(International power options available).

ENVIRONMENTAL:

Operating Humidity:
0-90% RH, non–condensing

Operating Temperature:
32° to 122°F | 0° to 50°C

PHYSICAL:

In metal enclosure:
5.5 x 5.5 x 1.5" | 140 x 140 x 38mm

1 lb. | .45kg

With Weatherproof Enclosure:

12.17 x 10.25 x 3.5" | 309 x 260 x 89mm

3.7 lb. | 1.67 kg

ENCLOSURE:

Durable powder coated metal housing suitable for wall or panel installation or weatherproof NEMA 4X rated fiberglass enclosure.

STANDARDS:

FCC Part 15 – Class A Compliant

901 Tryens Road • Aston, PA 19014 • PH: 877-373-2700 • F: 610-558-0222 • www.sensaphone.com



INSTALLATION AND SETUP GUIDE
VERSION 2.3

SENSAPHONE®
REMOTE MONITORING SOLUTIONS

Every effort has been made to ensure that the information in this document is complete, accurate and up-to-date. Sensaphone assumes no responsibility for the results of errors beyond its control. Sensaphone also cannot guarantee that changes in equipment made by other manufacturers, and referred to in this manual, will not affect the applicability of the information in this manual.

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First Edition, version 2.2, May 2017

Written and produced by SENSAPHONE®.

Please address comments on this publication to:

SENSAPHONE®

901 Tryens Road

Aston, PA 19014

Important Safety Instructions

Your Sentinel has been carefully designed to give you years of safe, reliable performance. As with all electrical equipment, however, there are a few basic precautions you should take to avoid hurting yourself or damaging the unit:

- Read the installation and operating instructions in this guide carefully. Be sure to save it for future reference.
- Read and follow all warning and instruction labels on the product itself.
- To protect the Sentinel from overheating, make sure all openings on the unit are not blocked. Do not place on or near a heat source, such as a radiator or heat register.
- Do not use your Sentinel near water, or spill liquid of any kind into it.
- Be certain that your power source matches the rating in the specifications of this manual. If you're not sure of the type of power supply to your facility, consult your dealer or local power company.
- Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by persons walking on it.
- Do not overload wall outlets and extension cords, as this can result in the risk of fire or electric shock.
- Never push objects of any kind into this product through ventilation holes as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock.
- To reduce the risk of electric shock, do not disassemble this product, but return it to Sensaphone Customer Service, or another approved repair facility, when any service or repair work is required. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock when the unit is subsequently used.
- If anything happens that indicates that your Sentinel is not working properly or has been damaged, unplug it immediately and follow the procedures in the manual for having it serviced. Return the unit for servicing under the following conditions:

    1. The power cord or plug is frayed or damaged.
    2. Liquid has been spilled into the product or it has been exposed to water.
    3. The unit has been dropped, or the enclosure is damaged.
    4. The unit doesn't function normally when you're following the operating instructions.

- To reduce the risk of fire or injury to persons, read and follow these instructions:

    1. Use only the specified type and size battery.
    2. Do not dispose of the battery in a fire. The cell may explode. Check with local codes for possible special disposal instructions.
    3. Do not open or mutilate batteries. Released electrolyte is corrosive and may cause damage to the eyes or skin. It may be toxic if swallowed.
    4. Exercise care in handling batteries in order not to short the battery with conducting materials such as rings, bracelets, and keys. The battery or conductor may overheat and cause burns.
    5. Remove main power connections before replacing the battery.

FCC Requirements

Part 15: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2 YEAR LIMITED WARRANTY

PLEASE READ THIS WARRANTY CAREFULLY BEFORE USING THE PRODUCT.

THIS LIMITED WARRANTY CONTAINS SENSAPHONE'S STANDARD TERMS AND CONDITIONS. WHERE PERMITTED BY THE APPLICABLE LAW, BY KEEPING YOUR SENSAPHONE PRODUCT BEYOND THIRTY (30) DAYS AFTER THE DATE OF DELIVERY, YOU FULLY ACCEPT THE TERMS AND CONDITIONS SET FORTH IN THIS LIMITED WARRANTY.

IN ADDITION, WHERE PERMITTED BY THE APPLICABLE LAW, YOUR INSTALLATION AND/OR USE OF THE PRODUCT CONSTITUTES FULL ACCEPTANCE OF THE TERMS AND CONDITIONS OF THIS LIMITED WARRANTY (HEREINAFTER REFERRED TO AS "LIMITED WARRANTY OR WARRANTY"). IF YOU DO NOT AGREE TO THE TERMS AND CONDITIONS THIS WARRANTY, INCLUDING ANY LIMITATIONS OF WARRANTY, INDEMNIFICATION TERMS OR LIMITATION OF LIABILITY, THEN YOU SHOULD NOT USE THE PRODUCT AND SHOULD RETURN IT TO THE SELLER FOR A REFUND OF THE PURCHASE PRICE. THE LAW MAY VARY BY JURISDICTION AS TO THE APPLICABILITY OF YOUR INSTALLATION OR USE ACTUALLY CONSTITUTING ACCEPTANCE OF THE TERMS AND CONDITIONS HEREIN AND AS TO THE APPLICABILITY OF ANY LIMITATION OF WARRANTY, INDEMNIFICATION TERMS OR LIMITATIONS OF LIABILITY.

1. **WARRANTOR**: IN THIS WARRANTY, WARRANTOR SHALL MEAN "DEALER, DISTRIBUTOR, AND/OR MANUFACTURER."

2. **ELEMENTS OF WARRANTY**: THIS PRODUCT IS WARRANTED TO BE FREE FROM DEFECTS IN MATERIALS AND CRAFTSMANSHIP WITH ONLY THE LIMITATIONS AND EXCLUSIONS SET OUT BELOW.

3. **WARRANTY AND REMEDY**: TWO-YEAR WARRANTY — IN THE EVENT THAT THE PRODUCT DOES NOT CONFORM TO THIS WARRANTY AT ANY TIME DURING THE TIME OF TWO YEARS FROM ORIGINAL PURCHASE, WARRANTOR WILL REPAIR THE DEFECT AND RETURN IT TO YOU AT NO CHARGE.

THIS WARRANTY SHALL TERMINATE AND BE OF NO FURTHER EFFECT AT THE TIME THE PRODUCT IS: (1) DAMAGED BY EXTRANEOUS CAUSE SUCH AS FIRE, WATER, LIGHTNING, ETC. OR NOT MAINTAINED AS REASONABLE AND NECESSARY; OR (2) MODIFIED; OR (3) IMPROPERLY INSTALLED; OR (4) MISUSED; OR (5) REPAIRED OR SERVICED BY SOMEONE OTHER THAN WARRANTORS' AUTHORIZED PERSONNEL OR SOMEONE EXPRESSLY AUTHORIZED BY WARRANTOR'S TO MAKE SUCH SERVICE OR REPAIRS; (6) USED IN A MANNER OR PURPOSE FOR WHICH THE PRODUCT WAS NOT INTENDED; OR (7) SOLD BY ORIGINAL PURCHASER.

LIMITED WARRANTY, LIMITATION OF DAMAGES AND DISCLAIMER OF LIABILITY FOR DAMAGES: THE WARRANTOR'S OBLIGATION UNDER THIS WARRANTY IS LIMITED TO REPAIR OR REPLACEMENT OF THE PRODUCT, AT THE WARRANTOR'S OPTION AS TO REPAIR OR REPLACEMENT. IN NO EVENT SHALL WARRANTORS BE LIABLE OR RESPONSIBLE FOR PAYMENT OF ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL AND/OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING BUT NOT LIMITED TO ANY LABOR COSTS, PRODUCT COSTS, LOST REVENUE, BUSINESS INTERRUPTION LOSSES, LOST PROFITS, LOSS OF BUSINESS, LOSS OF DATA OR INFORMATION, OR FINANCIAL LOSS, FOR CLAIMS OF ANY NATURE, INCLUDING BUT NOT LIMITED TO CLAIMS IN CONTRACT, BREACH OF WARRANTY OR TORT, AND WHETHER OR NOT CAUSED BY WARRANTORS' NEGLIGENCE. IN THE EVENT THAT IT IS DETERMINED IN ANY ADJUDICATION THAT THE LIMITED WARRANTIES OF REPAIR OR REPLACEMENT ARE INAPPLICABLE, THEN THE PURCHASER'S SOLE REMEDY SHALL BE PAYMENT TO THE PURCHASER OF THE ORIGINAL COST OF THE PRODUCT, AND IN NO EVENT SHALL WARRANTORS BE LIABLE OR RESPONSIBLE FOR PAYMENT OF ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL AND/OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING BUT NOT LIMITED TO ANY LOST REVENUE, BUSINESS INTERRUPTION LOSSES, LOST PROFITS, LOSS OF BUSINESS, LOSS OF DATA OR INFORMATION, OR FINANCIAL LOSS, FOR CLAIMS OF ANY NATURE, INCLUDING BUT NOT LIMITED TO CLAIMS IN CONTRACT, BREACH OF WARRANTY OR TORT, AND WHETHER OR NOT CAUSED BY

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Effective date 02/25/2015

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CHAPTER 1: INSTALLATION

INTRODUCTION

Congratulations on your purchase of the Sentinel Monitoring System. The system is designed to be an easy, cost–effective, cloud–based monitoring and data logging system to notify you when equipment or conditions go awry. The internet browser–based programming makes the device easy to use from any computer or tablet. Monitored conditions can include temperature, humidity levels, pressure, flow, leak detection, UPS systems, and more. The system allows multiple users to be notified immediately of any detected problems. Notification can occur via voice call, e–mail or SMS (text message), however voice calls and text messages require a premium subscription plan. The internal battery backup system insures the unit will continue to run if main power fails.

FEATURES

The Sentinel includes the following key features:

- Twelve sensor inputs to monitor environmental conditions and/or alarm contacts from other equipment.
- 10/100BASE-T Ethernet port.
- Battery backup for uninterrupted performance.
- Compact design allows wall-mount or weatherproof installation.
- Notification via e–mail, text message (optional) and voice call (optional).
- Relay output capable of automatic or manual control.
- Cloud–based user interface for programming, data storage, and alarm delivery.
- Available in optional weatherproof NEMA 4X enclosure
- Available with cellular modem in weatherproof NEMA 4X enclosure

TECHNICAL SUPPORT

If any questions arise upon installation or operation of the Sentinel, please contact the Sensaphone Technical Service Department at 610.558.2700 and have the following information available:

- Date of purchase _____
- Serial number _____

Technical support is available from 8:00 AM to 5:00 PM, M-F, eastern time.

ABOUT THIS MANUAL

This manual comprises the instructions necessary to install and setup the Sentinel. You should thoroughly read this manual to establish a basic understanding of the system and keep it as a reference.

INSTALLATION AND CONFIGURATION

PHYSICAL DESCRIPTION

The Sentinel is housed in a 5.5” x 5.5” x 1.5” enclosure, which can be easily mounted on a wall or back panel.

LAYOUT

The Sentinel has connections for twelve sensor inputs, an Ethernet port, and 12VDC power. See figure below:



Figure 1: Front Panel Layout of the Sentinel

1) Acknowledge/Standby Button
2) On/Off Switch
3) Power, Online, Standby LEDs
4) Alarm LEDs
5) Power Jack
6) Ethernet Jack
7) Sensor Input Terminal Strip
8) Relay Output Input

RJ-45 10/100BASE-T ETHERNET PORT

This jack is for connecting to your network so that the device can communicate with the Sentinel servers. Two LEDs indicate when the Sentinel has a valid link (green) and transmitted/received data (yellow).

SENSOR INPUTS

The sensor inputs labeled zones 1-12 are designed to interface with normally open/normally closed devices, 2.8K or 10K temperature sensors and 4-20mA transducers.

POWER ON LED (GREEN)

This light indicates that the Sentinel unit is powered and operational.

ALARM LEDS (RED)

The Alarm LEDs indicate if an alarm exists.

ONLINE LED (GREEN)

This light indicates that the Sentinel unit is communicating with the Sentinel servers.

STANDBY LED (YELLOW)

This light indicates that the Sentinel unit is in standby mode.

ACKNOWLEDGE/ STANDBY BUTTON

When an unacknowledged alarm exists (as indicated by a blinking red alarm LED), briefly press the button and the alarm LED will stop blinking, indicating that the alarm is acknowledged. To enter Standby mode, press and hold the button for at least 5 seconds until the Standby LED lights up, then release. To exit from Standby mode, hold the button down for 5 seconds until the Standby LED turns off.

INSTALLATION

This section provides information on:

- Operating environment
- Installation
- Connecting sensors
- Network Configuration

PARTS REQUIRED

- Screwdriver and #8 screws
- Network Hub, Switch, or Router that supports 10 or 100 BASE-T with Internet access
- Computer w/Internet Connection

OPERATING ENVIRONMENT

Before you install the Sentinel be sure that your operating environment meets the physical requirements of the equipment.

Operating Temperature:	32º – 122º Fahrenheit (0º – 50º C)
Humidity:	5 – 90 %RH, non-condensing
Power:	115VAC 50/60 Hz outlet within 6’

POWER

Connect the included DC power supply to the power jack on the Sentinel and then plug the power adapter into a 115V AC power outlet.

NETWORK CONFIGURATION

The Sentinel requires an Internet connection to operate. Using the included network cable, connect the Sentinel to your 10/100 network hub, switch, or router. Note that your network must support DHCP for initial configuration. You can change it to a Static IP later if required (see chapter 2). The green ONLINE LED should light up within a few minutes indicating that the device has connected to the Sensaphone.net servers.

> Technical Info: The Sentinel communicates over port 443 (the standard TCP port that is used for websites which use SSL encryption), so this must be open for outbound communication. The device also makes use of port 123 for clock synchronization (NTP), so this must be open for UDP outbound.

WALL MOUNT INSTALLATION

The Sentinel can be wall mounted using dry wall anchors and (4) #8 screws. Follow the steps below:

1) Install four drywall anchors (if necessary). Attach the Sentinel using four #8 tapping screws. See Figure 2 for dimensions.

2) Attach sensors to the zone terminals.

3) Plug the power adaptor into a 115VAC 50/60Hz outlet.

4) Connect a CAT5 cable to the Ethernet port and connect to a 10/100 network hub, switch or router.

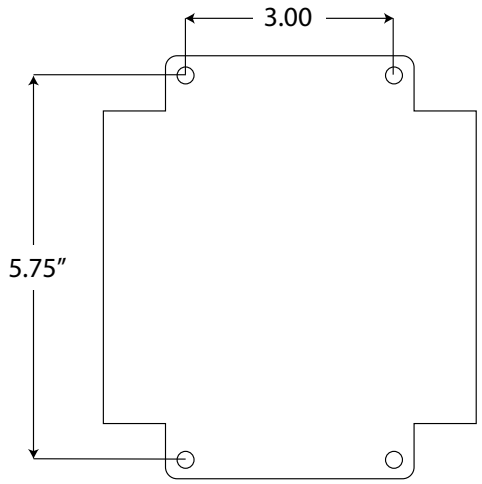


Figure 2: Sentinel mounting dimensions

CONNECTING SENSORS

The Sentinel is compatible with a wide variety of sensors including normally open/normally closed contacts, 2.8K and 10K temperature sensors, and 4–20mA current sources. Compatible sensors and accessories are shown on the Sentinel website. Sensors may be connected while the device is powered on or off. A proper size screwdriver is provided for your convenience. Contact Sensaphone or your Sensaphone reseller for assistance in selecting sensors for your monitoring requirements. A list of sensors and accessories is shown in Appendix B. Follow the instructions below to properly wire and configure the inputs for each type of electrical signal.

> **Warning**: The inputs are designed to work with low voltage signals. DO NOT connect voltages greater than 3.3V to the inputs. DO NOT connect 120VAC to the inputs.

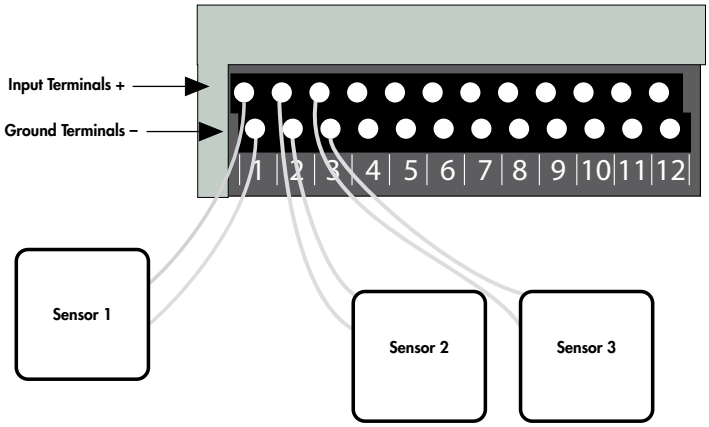
GENERAL WIRING CONSIDERATIONS

Most dry contact sensors can be connected to the Sentinel using inexpensive 2-conductor twisted-pair cable as small as #24 AWG. For temperature and 4–20mA sensors, use the wire chart below as a reference for selecting the appropriate wire gauge. Note that if the sensor is located far from the unit or if you are running cable in an electrically noisy environment, you should seriously consider using shielded cable. This will shield the signal from electrical interference, thereby preventing false readings and/or damage to the unit. For your convenience, Sensaphone has 22 gauge shielded cable available in 50' lengths (part number FGD-0010). To minimize electrical noise coupling between sensor wires and other wiring, follow the guidelines listed below:

- Route the power supply and network cables to the unit by a separate path then the wiring to the sensor inputs. Where paths must cross, their intersection should be perpendicular.
- Do not run sensor wiring and AC power in the same conduit.
- Segregate wiring by signal type. Bundle wiring with similar electrical characteristics together.
- If shielded cable is used, tie the shield to the input ground terminal.

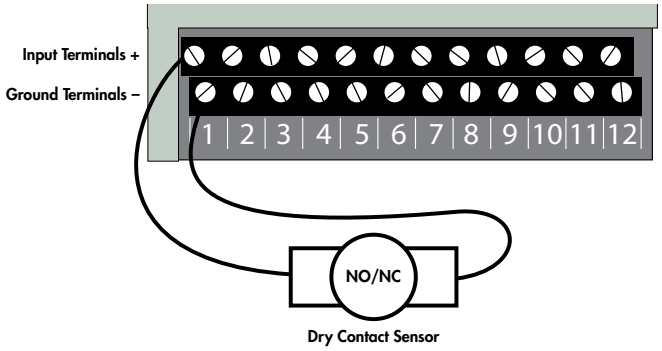
Wiring Distance	Minimum Wire Gauge
700’	#24 AWG
1500’	#22 AWG
2500’	#20 AWG

The zone terminal strip has an upper and lower level for connecting up to 12 sensors. The lower level terminals are all “ground” and are electrically connected together. The upper terminal strip is the positive connection for each sensor. See illustration below.



NORMALLY OPEN / NORMALLY CLOSED DRY CONTACTS

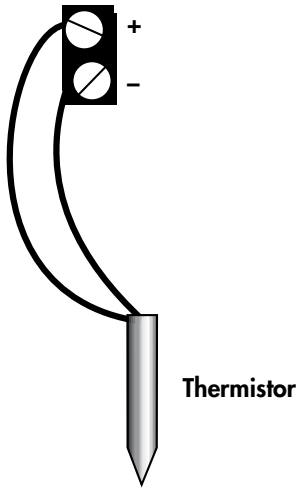
Dry contact sources consist of alarm relays or switches that are isolated and have no external voltage applied. These devices can be connected directly to the zone terminals without regard for polarity. Choose a zone and connect the wires to the corresponding screw terminals for that zone. The following figure shows how to connect a dry contact sensor:



Wiring a Dry Contact Sensor

2.8K/10K TEMPERATURE SENSORS

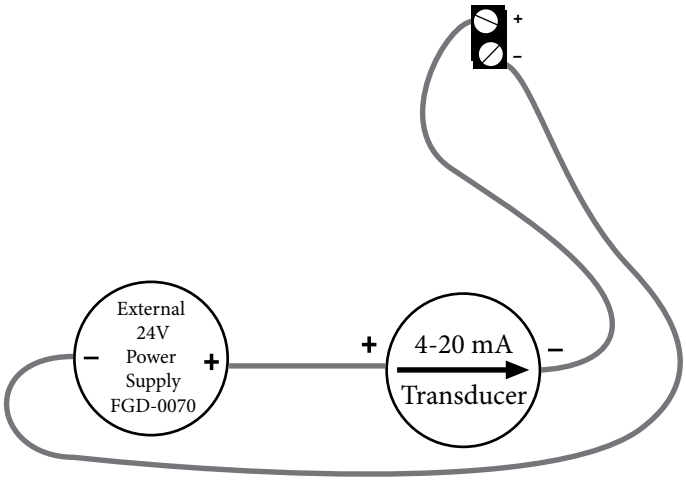
The Sentinel is compatible with 2.8K/10K temperature sensors that match the curve data listed in the tables in Appendix D. The monitoring temperature range of the 2.8K thermistor is -109 to 115ºF (-85º to 57ºC) and the 10K thermistor is -87° to 168°F (-66° to 76°C). Temperature sensors can be connected directly to the zone terminals without regard for polarity. Choose an alarm input and connect the wires to the corresponding screw terminals for that zone. 2.8K and 10K temperature sensors are available from Sensaphone. See Appendix B for part numbers. The figure below shows how to connect a temperature sensor:



Wiring a Temperature Sensor

4–20MA CURRENT LOOP TRANSDUCERS

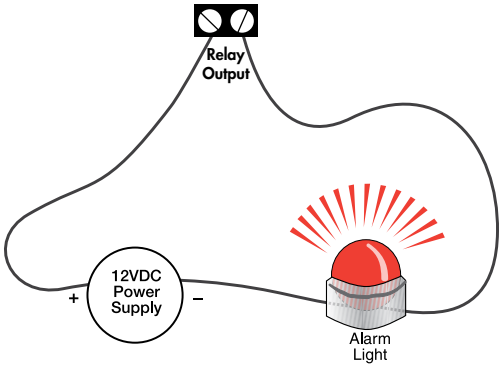
The inputs on the Sentinel are compatible with transducers that produce an analog output current of 4 to 20mA. Such transducers are available to measure tank and well levels, extreme temperatures, air pressure, water pressure, flow, voltage, current, rotational speed, etc. Contact our technical support department for assistance regarding your monitoring requirements (877-373-2700 or support@sensaphone.com). Follow the wiring diagrams below for connecting a 4–20mA device:



Wiring a 4–20mA device using an external 24 VDC supply.

RELAY OUTPUT WIRING

The Sentinel includes a relay output (switch) that can be used to turn on a light, siren, or other device whenever an alarm occurs. The output is a normally–open (i.e. off) dry contact that can be used for low voltage switching. The relay is rated for up to 30VAC/VDC 1 Amp. A sample wiring diagram is shown below:



The relay can be controlled manually (via the website or App) or automatically based on specific inputs or alarms. See chapter 3 for details.

BATTERY BACKUP

The Sentinel has an internal rechargeable battery backup pack (part #BAT-0032) which will provide up to 8 hours of backup time in the event of a power failure. The unit will charge the battery and monitor its charge level. The percent charge can be viewed on the website. The Sentinel contains circuitry to protect the battery from deep discharge damage and will disconnect the battery when all of its available energy has been expended. The battery backup module should last 4 to 5 years.



MEMORY/CLOCK BATTERY

The Sentinel contains a CR2 lithium battery to backup certain values in SRAM memory as well as the real-time clock. This battery should last between 5-10 years depending on how much time the device is powered off. {Note: Units manufactured prior to May 2016 contain a CR2032 lithium coin cell which has an estimated life of 2 - 5 yrs}.

RESETTING THE SENTINEL TO FACTORY DEFAULT SETTINGS

In the event that you can no longer connect to your Sentinel, you can reset the unit to factory defaults. On the bottom of the unit is a small hole. Beneath the hole is a push button. Insert a paper clip or similar item into the hole and push the button for 5 seconds while the device is powered on. The Sentinel will erase all of its programming and then reboot automatically. Alternatively you can also reset the device to defaults from the Sensaphone.net website. Go to the Manage Devices page, under the Admin menu. Select the device, choose Reset to Default Values from the drop down, and click Submit.

CHAPTER 2: SET UP

When your Sentinel "Online" LED is lit you can continue with the following website section.

1. Open an internet browser and go to www.sensaphone.net.
2. Fill in the form to create a new account.



3. Once you are logged in, click *Admin*, then *Manage Devices*. In the "Add a Device" section, enter the Serial Number of your Sentinel and enter a device name. Click the *Add Device* button when finished.



Your Sentinel is now online with the Sensaphone.net website. Read the section below to learn how to view status and program your device.

DESCRIPTION OF WEB PAGES

DASHBOARD



The dashboard will list all of the devices on your account. This page is automatically updated with the most current information available.

The numbers at the top will show how many Unacknowledged Alarms, Current Alarms, Units Online, and Units Offline that currently exist for all devices on your account.

The map will show the location of any device on your account that has an address or GPS location listed. You can hover over the icon to see the device name and status. If the icon for the device is green, your device status is OK. If it is red, your device has alarms. You can click on the icon to show the zones for the selected device.

The device table will display all devices on your account. Click on the *Details* button to display and configure the zones for that device. You can also use the search box above the table to search through the table, or click on the table column headers to sort the data.

Device Name – The name of the device

Status – The current status of the device (Okay, Alarms, Offline, or Standby) If the device has any unacknowledged alarms, a symbol will be displayed in this column

Power – Displays if the device is On or Off (--- will display if the device is offline)

Battery – The current percentage of the device battery (--- will display if the device is offline)

Last Response – The time that the device last connected to the server

STANDBY MODE

Standby mode puts the Sentinel in a temporary state such that no alarms will be detected, allowing onsite personnel to perform maintenance or other tasks that may have triggered an alarm otherwise. Standby mode can be entered using the Action drop down on the Dashboard page or via the pushbutton on the front of the unit. Standby mode will persist for the duration of time entered on the Device Configure screen and will automatically exit once the time expires. When using the pushbutton you must depress the button for 5 seconds. The Standby LED will light up to indicate that the device is in Standby mode. You can also exit Standby mode using the same methods.

Standby – Allows you to put the selected devices into Standby mode

Enter – Put the Sentinel in Standby mode for the length of time that is set on the Device Configure page

Enter (Untimed) – Put the Sentinel in Standby mode until you disable it

Exit – Take the device out of Standby mode

DEVICE DETAILS

The device details page displays the sensor values for your Sentinel. This page is automatically updated with the most current information available. At the top of the page are buttons to access the *Configuration*, *Alarm Delivery* and *Logs*.



At the top of the page, you will see the device name, description, address and alarm status.

You will also see all of the zones for your device in the table.

Zone – The name of the zone

Value – The current value of the zone

Status – The current status of the zone

Min/Max – Displays the highest and lowest values recorded

If the device has any unacknowledged alarms, a symbol will be displayed in the status column

The Action dropdown menu provides options that allow you to interact with your device, such as acknowledging alarms, resetting pulse count, runtime and min/max values, and putting the device into standby mode.

CONFIGURE DEVICE

At the top of the dashboard, click *Configure Device* to go to the device and zone programming screens.

The box on the left will display all of your configureable zones, as well as Device (for general device settings), Power, Battery and Relay Output. As you select an option, the form on the right will change to display the appropriate data. Complete the address so that the Sentinel icon will be displayed at the appropriate location on the dashboard map.

This page also contains settings for the *Device Offline* alarm and for *Standby Mode*. The *Device Offline* alarm will notify you if your devices stops communicating with the sensaphone.net servers for the programmed time duration.

Once you have completed your programming, click on the *Save Settings* button at the bottom of the page.



Configuring a Static IP Address

If you would like to assign your device a Static IP address, go to the Configure Device page and scroll down to the IP Settings section. Uncheck the DHCP box and the network settings will appear so that you can enter a Static IP address, Gateway, etc... Click Save to have the new settings take effect.



Zone Programming

Select the zone you would like to configure from the box from the left. A sample screen for a temperature sensor is shown below.



ZONE PARAMETER DEFINITIONS

Enable/Disable: This setting determines if the Zone is being used (Enabled) or not (Disabled). Selecting Disabled will remove the gauge from the Summary screen.

Name: Enter a name for the sensor you are monitoring which describes its purpose and/or location. The name will appear on the Device Details screen as well as on alarm messages.

Type: Choose the type of sensor you are connecting to the Zone input. For temperature sensors choose either degrees F or C.

Units: The Units field is used to describe the units of measure for the value being monitored. When Temperature is selected the Units field will automatically display F (Fahrenheit) or C (Celsius). When a 4-20mA type is selected you can enter the appropriate text for the monitored condition (e.g. %RH, PSI, GPM, RPM,…). When you select Normally Open (NO) or Normally Closed (NC) you can choose from several preset descriptions for the Open and Closed state of the input. The first word always describes the Open state of the contact and the second the Closed state. If you choose Custom you can enter your own text for the Open and Closed states. To do this simply type the words into the lower Units field and separate them with a slash (/). For example, "Slow/Fast", "Safe/Danger", "Dry/Wet".

Calibration: This field can be used to offset the Zone value either positive or negative if there is some error in the reading.

Alarm Low: This is used to determine the low level at which a temperature or 4–20mA Zone has reached the alarm threshold. The value must fall below the Alarm Limit to trip an alarm.

Alarm High: This is used to determine the high level at which a temperature or 4–20mA Zone has reached the alarm threshold. The value must exceed the Alarm Limit to trip an alarm.

Table Low: The Table Low value is used to define the lower range (4mA) of your 4-20mA sensor.

Table High: The Table High value is used to define the upper range (20mA) of your 4-20mA sensor.

Alarm Delivery Enable/Disable: When Enabled, alarm messages will be delivered, if set to Disabled alarm messages will not be delivered.

Recognition Time: This is the length of time that an alarm condition must be present before a valid alarm exists and message delivery is started.

Alarm Hold Time: When an alarm occurs, the *Alarm Hold Time* will latch the alarm condition for the programmed time period, thus preventing redundant alarms from sending additional notification messages. This is useful for alarms that are likely to trip several times within a short time period, such as motion detectors.

Return to Normal Enable/Disable: This feature instructs the Sentinel to send a message when a zone input has changed from an alarm condition back to a normal condition. Anyone who received the original alarm message will also be sent the Return-to-Normal message.

Alarm Reset Enable/Disable: This setting enables or disables the Alarm Reset Feature. The Alarm Reset feature is used to re-send alarm messages in the event that a fault condition is not corrected in a timely fashion. If an alarm continues to exist for the duration of the programmed Reset Time (see below) the alarm will reset (reactivate) and the alarm message delivery process will begin all over again. This is an optional feature.

Alarm Reset Time: This is the time allowed for an alarm's fault condition to be corrected before the Sentinel resets (reactivates) the alarm and begins the message delivery process all over again. It is recommended that this be set to no lower than 30 minutes to prevent numerous messages from being sent.

Datalogging Mode: The Sentinel has two modes of data logging for each zone: Continuous or While In Alarm. In Continuous mode the unit will log the value of the input on a fixed time interval all the time. The Normal Interval sets the logging rate while the value is within the normal range. The Alarm Interval sets the logging rate while the value is an alarm condition. By choosing the While In Alarm mode you can choose to have the unit only log values when it exceeds the alarm limits.

Alarm Datalog Interval: This is the interval that data will be logged while the input is beyond the programmed alarm limits. (Note: this is regardless of the programmed Alarm Recognition Time).

Normal Datalog Interval: This is the interval that data will be logged while the input is within the programmed alarm limits. To maximize the available memory for datalogging, set the Datalog Interval for each zone to multiples of each other. For example, Zone 1 can be set to 10 minutes, Zone 2 to 30 minutes, Zone 3 to 60 minutes, etc…

MANAGE USERS

The sensaphone.net website allows you to set up users that will be linked to your account. Each user can be configured to have their own login for website access and/or be contacted for alarms. In addition, you can choose to give alarm acknowledgement capability to each user.

There are several levels of permissions that can be assigned to each user. You can also enter contact information for alarm delivery purposes. From the main menu, select *Users*, then *Manage Users*. To add a new user, click on the *Add User* button. The example below shows a user setup as an administrator with four contact destinations.



The following defines the various permission levels:

Administrator – Full site access, all devices on your account

Supervisor – Gives the user access to the Dashboard, device-specific pages (for example, Device Details), Manage Users, and Manage User Groups, but for only the devices you choose for them (chosen under the Device Groups section of the form). Supervisors will have the ability to create new users, but they can only give the users Supervisor access or lower.

User – Gives the user access to the Dashboard, but only shows the devices you choose for them (chosen under the Device Groups section of the form)

None – No access to the website

Alarm Delivery – Choose whether you would like the user to be able to receive alarm notifications or not.

Disabled – No alarm delivery

Inform Only – User is notified about the alarm, but cannot acknowledge it

Allow Acknowledgement – User is notified about the alarm and is able to acknowledge it

User Information

Next, enter details about this user. The user's name is the only required information.

Contact Details

The *Contact Details* section is where you enter the telephone numbers, text numbers, and email addresses to send alarm messages. {*Note that phone calls and text messages require a Premium Ethernet or Cellular subscription. Email alarm delivery is free*}. A '1' in the beginning of the telephone number is not required. To add additional contacts click "Add Contact". Be sure to add all of your possible contact methods in this section. You can choose which ones get used on the *Default Alarm Delivery Schedule or Zone Alarm Delivery Schedul*e.

You can also create a time schedule to limit when you'll receive alarm messages. There is an overall *User Schedule* as well as individual Schedules for each contact. The default setting for all schedules is enabled, 24/7. In the sample screen below, the highlighted section shows the times when this user will be contacted for alarms:



*Note that if you configure both a User Schedule and individual Contact Schedules, there must be overlap in order for alarm messages to be delivered.

Login Details

Users will login with an email address and password. Enter this information in the *Login Details* section. In the event that a user forgets his/her password they can use the reset password feature on the main login page.

Device Access

For accounts with multiple users and/or devices, you can choose to limit a user's access to selected devices. In the *Device Access* section, choose which units this User can access. See sample screen below:



Click on 'Save Changes' once you are finished.

MANAGE USER GROUPS

Allows you to set up groups of users that can be used on other site pages.

Select the group you wish to edit from the dropdown menu, or select *Create New Group* to make a new group.

Make sure to give each group a unique, descriptive name so they can be easily referenced.

Click on the plus icon to add users to the group. A pop up modal window will show that will list all the alarm users you have added to your account from the Manage Users page (see that page description for more information).

You can select an entire user (all destinations listed under that user at the time of the alarm will be notified) or individual destinations of the user.

Click on the red X icon to remove that user from the group.

Once you are finished adding and removing users, click on the *Save Group* button at the bottom of the page.

ALARM DELIVERY

The Alarm Delivery section is where you configure the people that will be contacted when an alarm occurs. You can setup a *Default Alarm Delivery Schedule* (i.e. contact list) for each device or you can create a separate *Zone Alarm Delivery Schedule* for each individual zone. A combination of both can also be used (e.g. some zones use the default schedule and others use a custom schedule). The first step is to configure your Users and Contacts as described in the *Manage Users* section. If you haven't completed that step please do it first.

Default Alarm Delivery Schedule

To get started select a device from the Dashboard and click *Details*. Next click the *Default Alarm Delivery* button. Click the *Add Destination* button to select people from your User list. You can select all of the User contacts or just a few if desired. See sample screen below:



Continue clicking the *Add Destination* button to add additional User's to the list. If you would like to insert a delay between the first User (or group of Users) and the next User, click the *Add Tier* button and enter the delay time. Users in this Tier will not be contacted until the delay time expires. Click *Save Changes* when your schedule is complete.

*Note that the Tier Delay timer starts at the time the alarm occurs. If the alarm is acknowledged before the delay time expires then Users in the 2nd Tier (and beyond) will not receive the alarm message. See sample programming screen below:



Zone Alarm Delivery Schedule

A Zone Alarm Delivery Schedule is an alarm contact list that only applies to one specific zone. You can create a separate Zone Alarm Delivery Schedule for each individual zone if required. To configure a *Zone Alarm Delivery Schedule* select a Zone from the *Device Details* page. Then click the *Zone Alarm Delivery* tab on the right. Select *Custom* to configure a contact list for the selected zone. Follow the steps as described above to complete the schedule.

Quick-Add Destinations

Quick-Add Destinations are those that can be easily entered to the notification list without creating a User Account. Note, however, that destinations added here will be inform-only (e.g. **cannot acknowledge alarms**). This entry method is useful for sending messages to people who do not require a user account in the system but may want to be informed when a particular alarm occurs.

Alarm Acknowledgment

Alarms can be acknowledged from the dashboard page by selecting a device using the checkboxes next to each device, and then clicking the "Action" drop-down at the top of the screen. You can acknowledge both Device Offline alarms or Zone alarms. Devices with 'Unacknowledged' alarms are identified with an exclamation point within a triangle. Once the alarm is acknowledged this symbol will disappear. You can acknowledge multiple alarms on multiple devices at the same time. Alarms can also be acknowledged during telephone calls by entering 555 when prompted, or by replying to alarm messages sent via email, or by replying to a text message with the letters "Ack".

LOGS

The Sentinel includes an Alarm Log and Data Log. The Alarm Log lists all alarm activity for the selected device. You can narrow down the messages by individual zones or you can select multiple zones. The Data Log contains the recorded values for each zone based on the parameters you set up on the Zone Configuration screens. You can display the values on the screen as well as graph them. There is also an option to Save the data to a file. To get to the Device Logs section, click the *Details* button from the Dashboard for the device you would like to view, then click the *Device Logs* button.

Alarm Log – Shows the history of all alarm notifications that were sent for the device

Data Log – Show the history of all logged zone values and statuses for the device

Export Data - Allows you to save selected Alarm Log or Data Log records in either CSV or pdf format. Note that CSV formatted files can be opened in Microsoft Excel.



Note that for Normally Open and Normally Closed zone types, the Sentinel will record a "0" when the input is presented with an open circuit and a "1" when the input has a closed circuit. Depending on your sensor and programming, this may represent either a normal or alarm condition.

DEVICE MANAGEMENT

You can add, modify, and remove Sentinel devices from your account on the Manage Devices screen. From the main menu select Admin, then Manage Devices. Listed below are the device-related actions that can be done.

Adding Devices - To add a new device to your account, enter the device serial number (located on the bottom of the unit in the format 00:07:F9:00:00:00) and give the device a name, then click *Add Device*.

Reboot Device - To reboot your device, select it from the list to the left and then choose Reboot Device from the drop down box at the bottom of the page, then click Submit. Your Sentinel will reboot and then reconnect within a few minutes. Your Sentinelgramming will remain intact.

Remove From Account - To remove a device from your account, select it from the list to the left and then choose Remove from Account from the drop-down box at the bottom of the page. Then click *Submit.*

Reset to Default Values - To reset a device to default settings, select it from the list to the left and then choose *Reset to Default Values* from the drop-down box at the bottom of the page. Then click *Submit.* Allow several minutes for your device to complete the reset process.



DEVICE GROUPS

In cases where you have many devices and many users it may be desirable to create Device Groups. These can make it easier to assign device permissions to specified Users. From the main menu select Admin, then Device Groups. In the main window, you will see a list of all your devices and any groups you may have already created. Devices are shown with a green device icon and groups are shown with a black icon. You can have multiple groups, and you can even have groups within a group. If a device icon is lined up on the left-most side of the window, they are not in a group.

To add a new group, click on the Add Group button at the top of the page. A 'New Group' icon will appear in the list. You can rename the group by right clicking on it and selecting Rename. To move a device into a group, click on the device and drag it into the group. Continue adding devices until you're finished, then click Save Groups.

The blue number shown on the group icon shows how many devices are within that group. To remove a group, right click on the group and select Delete. Any devices in that group will be moved up one level. For example, if a group that had two devices was deleted, the two devices would be shifted to the left and would no longer be in any group. You can also click and drag a device or group to reorder them. To search through your devices click on Filters. You can choose to hide any device or group that does not match your search, and you can choose to only search through your devices and not your groups. Once you are finished editing your groups, click on the Save Groups button at the bottom of the page.

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CHAPTER 3: CONFIGURING THE RELAY OUTPUT

The Sentinel includes a relay output that can be used to control a light, siren, or other low voltage device. The output can be configured to switch either manually or automatically when a zone changes state or exceeds the alarm limits. To program the output click *Output* from the *Device Details* or *Configure Device* screen. The following configuration page will appear:



Enter a Name so that you'll know what the Output will be controlling. The Output can operate in Manual mode or Automatic mode. In manual mode you can turn the relay ON or OFF through the web page or the mobile App. To manually switch the relay output, click in the State field and select either ON or OFF, then click *Save Changes*. The change request will be sent to the Sentinel and the *Current Value* will update after the output change has successfully completed.

In Automatic mode the relay can be programmed to turn-on automatically when certain conditions are met. Listed below is a description of the parameters that apply to the automatic modes.

Input Selection - Next to the Automatic mode selection box is another drop-down that allows you to select which zones will control the output. There are four options (Zone List, Type List, All Inputs, and Limit: Zones).

Zone List: This option allows you to individually select which zones will cause the output to switch. Check the boxes next to the desired zones.

Type List: This option allows you select zones based on the zone Type. For example, you could have all of the zones configured for Temperature control the output.

All Inputs: This option selects all of the inputs (zones).

Limit: Zones: This option allows you to independently control the output based on the value of one or two zones using greater-than, less-than, or equal-to comparison statements. A separate Output-On and Output-Off instruction can be configured with its own comparison value. See sample below:



Action - This setting determines what the Output will do when the selected zone (or zones) exceeds the alarm limits. You can have the relay Activate (turn-on), Deactivate (turn-off), or Cycle (ON under normal conditions, momentarily OFF for 10 seconds when an alarm condition occurs, then back ON).

Trigger - The trigger determines what will cause the output to change state. There are 3 options to choose from which are described below:

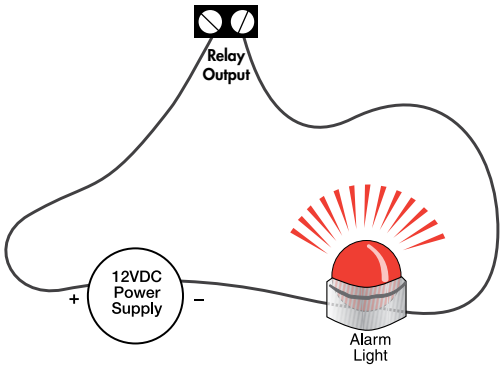
Unacknowledged Alarms: Choosing this option will make the Output change to the setting defined by the Action for as long as an Unacknowledged Alarm persists on the selected zones. Once the alarm is acknowledged the Output will revert back to its normal position.

Alarm Condition: Choosing this option will make the Output change to the setting defined by the *Action* for as long as the selected input(s) remain in Alarm, regardless of acknowledgement. Once the selected zones return to their normal state the Output will revert back to its normal position.

Zone State: Choosing this option will make the output change to the setting defined by the *Action* as soon as the selected zones exceed the alarm limits. In other words, the alarm recognition time is not enforced, and the Output will change instantly. Once the selected zones return to their normal state the Output will revert back to its normal position.

Relay Output Wiring

The relay output can be used to turn on a light, siren, or other low voltage device. The relay is rated for up to 30VAC/VDC 1 Amp. A sample wiring diagram is shown below:



APPENDIX A: WEEKLY TESTING PROCEDURE

We recommend that you test your Sensaphone weekly to be sure it is functioning properly. This will ensure that when a problem arises the Sensaphone will be ready to alert the appropriate personnel.

There are several tests that can be performed:

1.) Create an alarm on each zone by tripping all connected sensors.

Temperature sensors: Heat or cool the sensor.

Motion sensors: Have someone walk in front of the sensor.

Door/window sensors: open the door/window.

Water sensors: Apply a small amount of water beneath the sensor or use a wet towel and touch it to the sensor probes.

Humidity sensors: Raise the humidity around the sensor by holding a cup of very hot water beneath the sensor.

2.) Allow the unit to contact all programmed users. This will make sure that the Sensaphone is programmed properly. It will also prepare personnel to respond appropriately when they receive a message from the Sensaphone.

3.) Test the battery (if installed) by unplugging the AC adapter and making sure that the Sensaphone continues to function. Keep the AC adapter unplugged so that a Power Failure alarm occurs. Plug in the AC adapter after the unit has finished.

4.) Keep a log of your tests, noting the date and whether the Sentinel passed in each category tested. An example of such a log is shown below. (See "Test Log" at the end of this manual.)

WEB600 Test Log

Date	Inputs		Alarm		Battery		
	Pass	Fail	Pass	Fail	Pass	Fail	
07/19/09	☒	☐	☒	☐	☒	☐	Bob H
08/20/09	☒	☐	☒	☐	☒	☐	Alex G.
09/19/09	☒	☐	☒	☐	☒	☐	Bob H.
	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	

If you require assistance, call Sensaphone Technical Support at 610-558-2700.

APPENDIX B: ACCESSORIES

The sensors listed below are available from Sensaphone, and represent the most commonly used zone devices. Other dry contact sensors, designed for more specialized applications, may also be used. Commercial or industrial electrical supply houses can provide devices to monitor virtually any condition. For further information, contact Sensaphone Customer Service at 610-558-2700.

Part #	Description	Part #	Sensor/Switch
BAT-0032	Sentinel Battery	FGD-0100	2.8k Remote Temperature Sensor
FGD-0006	Magnetic Reed Switch	FGD-0101	2.8k Weatherproof Temperature Probe
FGD-0007	Passive Infra-Red Detector	FGD-0102	10k Weatherproof Temperature Probe
FGD-0010	50' two-conductor #22AWG shielded Cable	FGD-0103	10k Indoor Decorator
FGD-0013	Spot Water Detector	FGD-0104	10k Outdoor Air Weatherproof
FGD-0022	Temp° Alert	FGD-0205	Multi-Point Wireless I/O System
FGD-0027	Humidistat	FGD-0301	Pressure Sensor
FGD-0049	Smoke Detector with Built-in Relay	FGD-0303	Vibration Sensor
FGD-0052	Humidity 4-20mA Transmitter		
FGD-0053	24VDC Power Supply		
FGD-0054	Power-Out Alert		
FGD-0056	Zone Water Detector w/Water Rope		
FGD-0063	Additional 10' Water Rope for FGD-0056		
FGD-0065	Carbon Monoxide Sensor		
FGD-0066	Air Quality Sensor		
FGD-0067	Surge Suppressor		
FGD-0070	Power supply with battery backup		

APPENDIX C: SPECIFICATIONS

ALERT ZONES

Number of Zones: 12

Zone Connector: terminal block

Zone Types: N.O./N.C. contact, 2.8K Thermistor (-109° to 115°F, -85° to 57°C) And 10K Thermistor (-87° to 168°F; -66° to 76°C), and 4-20mA (-80,000.0 to 80,000.0

Zone Characteristics: 28.7KΩ to 3.3V (temperature/contact) or 250 Ohms to ground (4-20mA)

A/D Converter Resolution: 12 bits ±2 LSB

Zone Protection: 5.5VDC Metal Oxide Varistor with fast acting diode clamps.

Pulse Counting: 1ms minimum duration, 1 pulse-per-second maximum rate

RELAY OUTPUT

Rated for 1A 30VAC/ 1A 30VDC Maximum

DATA LOGGING

1 minute to 24 hour sampling rate

User programmable channel selection

Zones 1 – 12

Battery

Input Power

LED INDICATORS

Power: On steady when the unit is powered on.

Alarm: Off when no alarm exists.

Ethernet Link and Activity LEDs

Online

Standby

COMMUNICATION TYPE:

10/100 BASE-T Ethernet with SSL encryption

POWER SUPPLY

Power Supply: 120VAC/12VDC 50/60Hz 6W wall plug-in transformer w/6’ cord.

Power Consumption: 2 Watts

Power Protection: Metal Oxide Varistor

BATTERY BACKUP

Rechargeable Battery: Internal 8 Hr NiMH Battery Pack (Part # BAT-0032).

Memory/Clock Battery: Internal 5-10 yr CR2 lithium (Part # BAT-0033).

ENVIRONMENTAL

Operating Temperature: 32–122° F (0–50° C)

Operating Humidity: 0–90% RH non-condensing

Storage Temperature: 32°–140° F (0–60° C)

PHYSICAL

SCD-1200

Enclosure: Powder-coated aluminum enclosure with tabs for wall or panel mounting

Physical Dimensions: 5.5” x 5.5” x 1.5” (140 mm x 140 mm x 38 mm)

Weight: 1 lb. (0.45 kg)

SCD-1200-CD, -SD (Weatherproof)

Enclosure: High impact polycarbonate, UL Type 4X/6P (IP66/68)

Physical Dimensions: 9.5” x 11.1” x 3.5” (241 mm x 282 mm x 89 mm)

Weight: 6 lb. (2.72 kg)

SCD-1200-4Gxxxx (Weatherproof w/Cellular Modem)

Enclosure: High impact polycarbonate, UL Type 4X (IP66)

Physical Dimensions: 12.0” x 13.7” x 7.4” (305 mm x 348 mm x 188 mm)

Weight: 14 lb. (6.35 kg)

APPENDIX D: THERMISTORS

2.8K THERMISTOR DATA

Degrees Celsius	Resistance (Ohms)
-50	187,625
-40	94,206
-30	49,549
-20	27,180
-10	15,491
0	9,142
10	5,572
20	3,498
30	2,256
40	1,491
50	1,009
60	697
70	490
80	351

10K THERMISTOR DATA

Degrees Celsius	Resistance (Ohms)
-50	441.3K
-40	239.8K
-30	135.2K
-20	78.91K
-10	47.54K
0	29.49K
10	18.79K
20	12.25K
30	8,194K
40	5,592
50	3,893
60	2,760
70	1,990
80	1,458
90	1,084
100	816.8
120	481.8
130	376.4
140	297.2
150	237.0

APPENDIX E: RETURNING THE UNIT FOR REPAIR

In the event that the Sentinel does not function properly, we suggest that you do the following:

1) Record your observations regarding the Sentinel's malfunction.

2) Call the Technical Service Department at 610-558-2700 prior to sending the unit to Sensaphone for repair.

If the unit must be sent to Sensaphone for Servicing, please do the following:

1) Unplug the AC power supply from the wall outlet and disconnect all sensors from the alert zones.

2) Carefully pack the unit to avoid damage in transit. Use the original container (if available) or a sturdy shipping box.

3) You must include the following information to avoid shipping delays:

    a) Your name, address and telephone number.

    b) A note explaining the problem.

4) Ship your package to the address below:

SERVICE DEPARTMENT

SENSAPHONE

901 Tryens Road

Aston, PA 19014

5) Ship prepaid and insured via UPS or US Mail to ensure a traceable shipment with recourse for damage or replacement.

APPENDIX F: TEST LOG

Date	Inputs		Alarms		Battery						Tested By
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	

Date	Inputs		Alarms		Battery						Tested By
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	
	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	Pass ☐	Fail ☐	

ANT-121-002

Vandal Resistant 3G/4G/LTE Omni-Directional Antenna

Applications

- Kiosks
- Vending Machines
- Digital Signage
- Video Surveillance
- Point-of-Sale Terminals
- SCADA / Telemetry / PLCs



Product Features

- Vandal Resistant
- Low Profile ~ 3 inches Tall
- Weatherproof
- Compatible with all 3G & 4G/LTE Networks
- Compatible with most Cellular Modems/Routers
- 3 – 5 dBi Peak Gain
- Omni-Directional
- SMA Male Connector on 10 ft Low-Loss Coax

Ordering Information

Part No.	Description
ANT-121-002	Vandal Resistant Low Profile 3G/4G/LTE Omni-Directional Antenna - 3-5 dBi Gain - Fixed Mount - 10 ft Coax Lead

General Description

This low profile (~ 3 inches tall) fixed screw mount omni-directional antenna provides 3 to 5 dBi of gain and supports all cellular frequency bands for AT&T, Verizon, Sprint, T-Mobile, Bell, Rogers, Telus and other cellular carriers worldwide.

Ideal for use in vending machines, meter housings, equipment sheds, NEMA enclosures or other locations requiring a low-profile vandal resistant external antenna. Also suitable for vehicle mounting on buses, vans, trucks or other mobile installations.

Permanently mounts via a 5/8 in. (16 mm) hole with locking internal nut. Resists vandalism with no exposed coax cable, high impact ABS radome shell and an extra thick threaded mounting post. Includes 10 ft of low-loss RG58U coax fed through center mounting post. Includes "L" bracket for optional wall mounting.

Integrated SMA male plug connector mates with SMA female jack found on most cellular modems and routers.

Completely waterproof (IP67) when properly installed with post extending into a water-tight enclosure. Not waterproof when used exclusively with wall bracket.

For optimum performance this antenna should be mounted on a flat, horizontal metal surface at least 8 inches in diameter.

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Electrical Specifications

Parameter	Rating
Frequency Range	698-960 / 1710-2700 MHz includes all 2G, 3G, 4G, LTE Bands
Gain	3 – 5 dBi
VSWR	≤ 2.0:1
Input Impedance	50 Ohm
Polarization	Vertical
Max Input Power	50 W
Ground Plane	8 inch (20 cm) diameter min

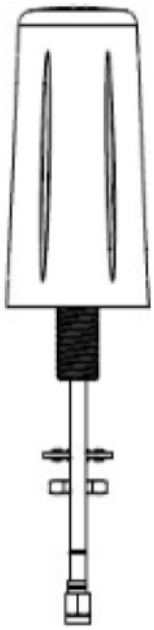
Mechanical Specifications

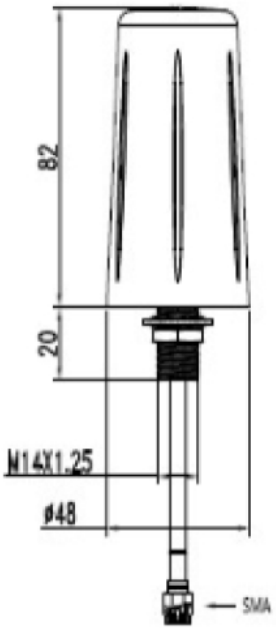
Parameter	Rating
Connector Type	SMA Male (plug)
Cable Length	10 ft (3 m) of LMR RG58U low-loss coax
Height	Radome: 3.2 inches (82 mm) above mounting surface Overall: 4.0 inches (102 mm)
Diameter	Radome: 1.9 inches (48 mm) at base Mounting post: 0.55 inches (14 mm)
Weight	6.2 oz (176 g excluding mounting bracket)
Materials	Radome: UV stabilized ABS plastic Connector: Brass with Nickel plating Mounting Bracket: Aluminum Adhesive Pad: Urethane Foam
Antenna Color	Black
Operating Temperature	-40°C to +70°C
Environmental Rating	IP67 (waterproof)

Operation of this device outside the parameter ranges given above may cause permanent damage.

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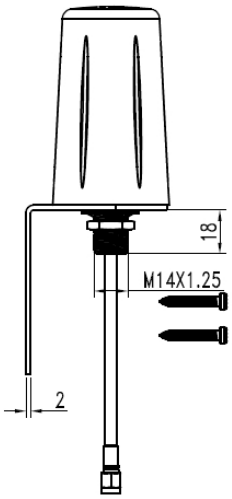
Mechanical Dimensions

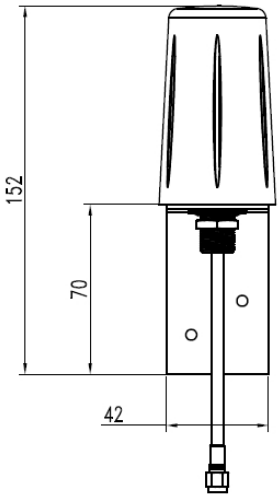


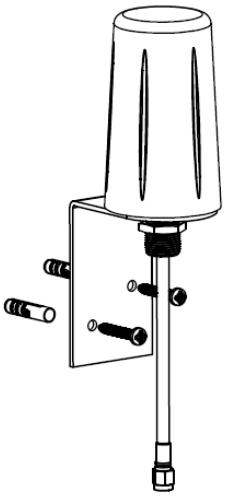




With Wall Mounting Bracket



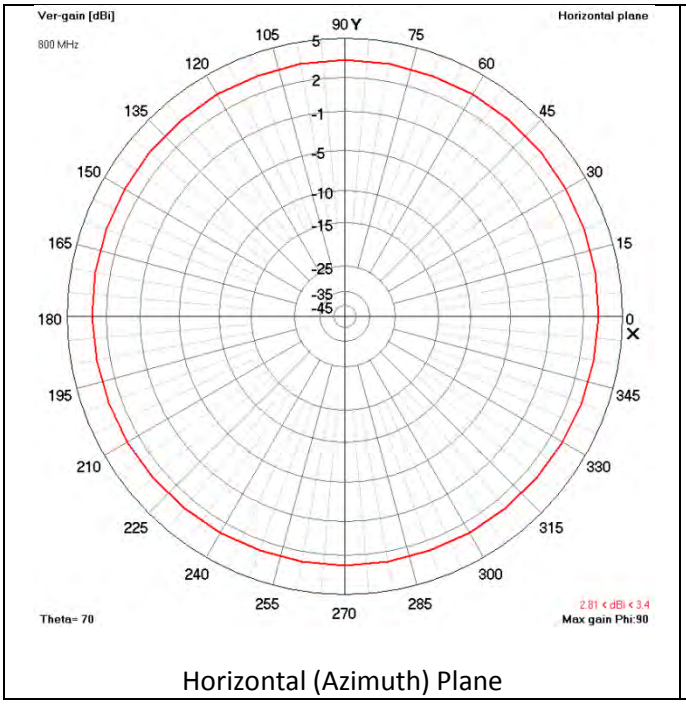




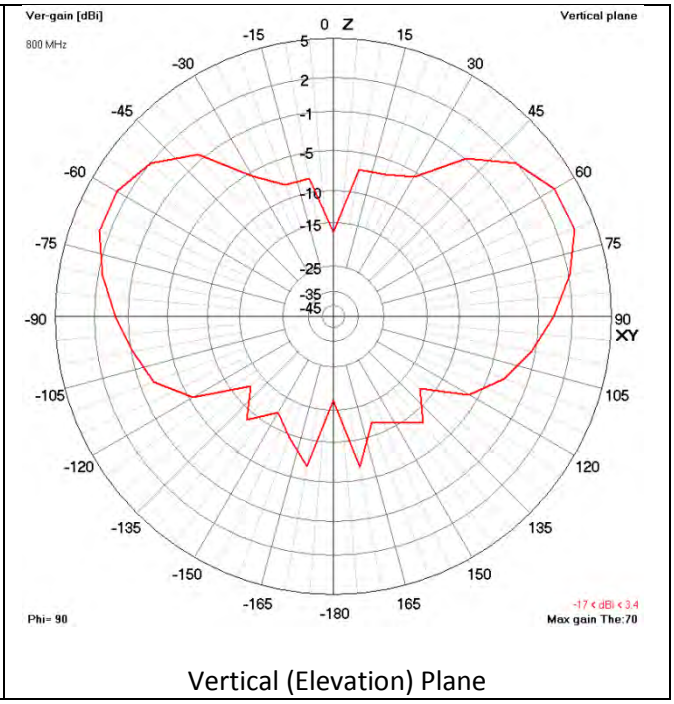
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Radiation Patterns

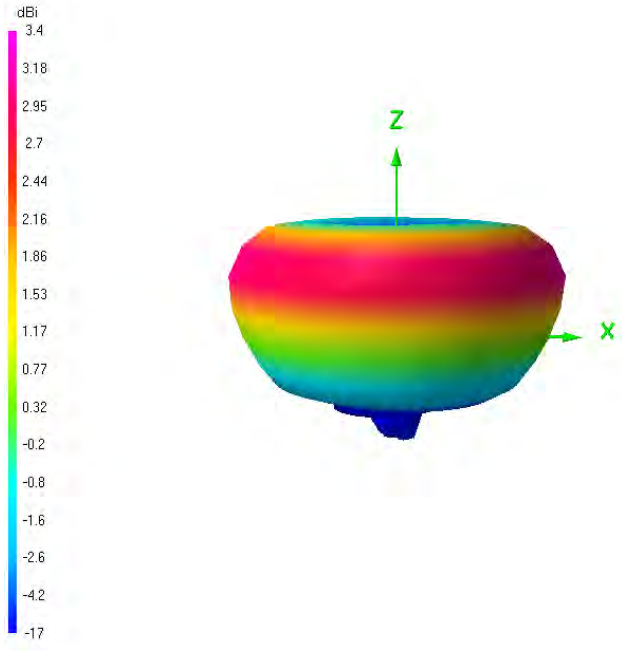
800 MHz



Horizontal (Azimuth) Plane



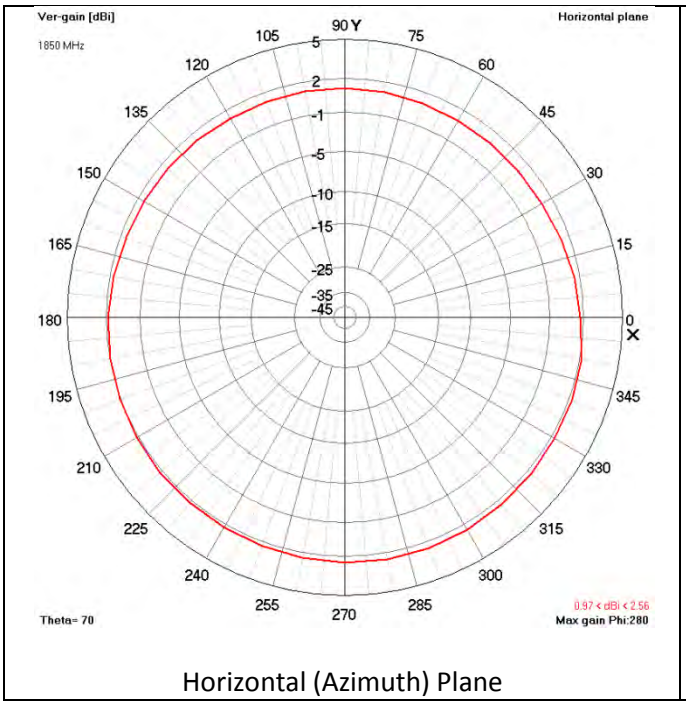
Vertical (Elevation) Plane



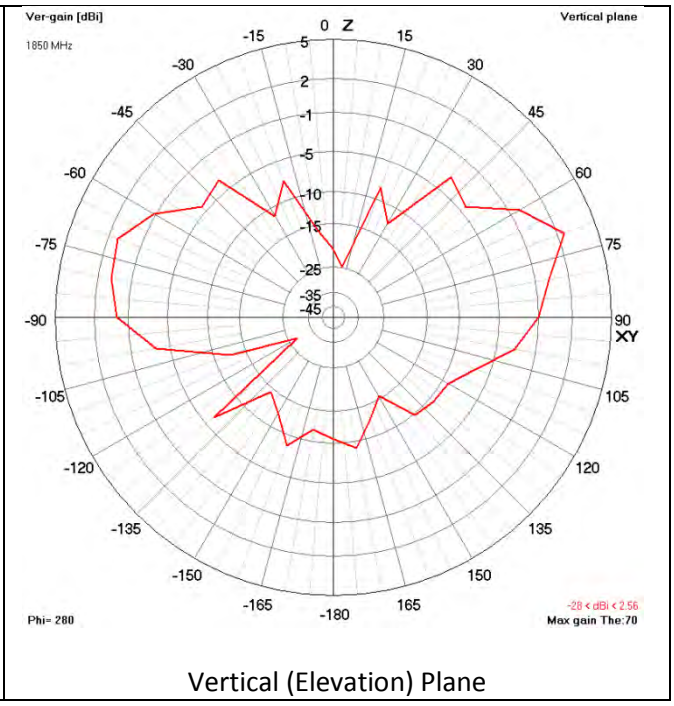
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Radiation Patterns

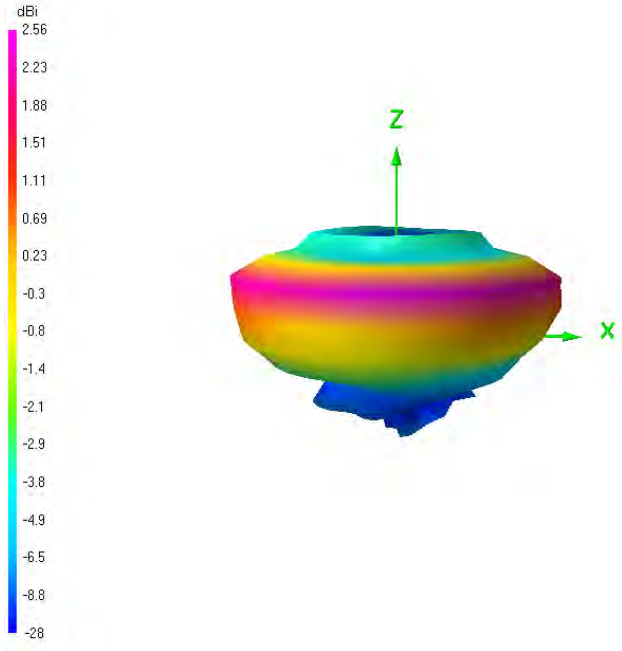
1850 MHz



Horizontal (Azimuth) Plane



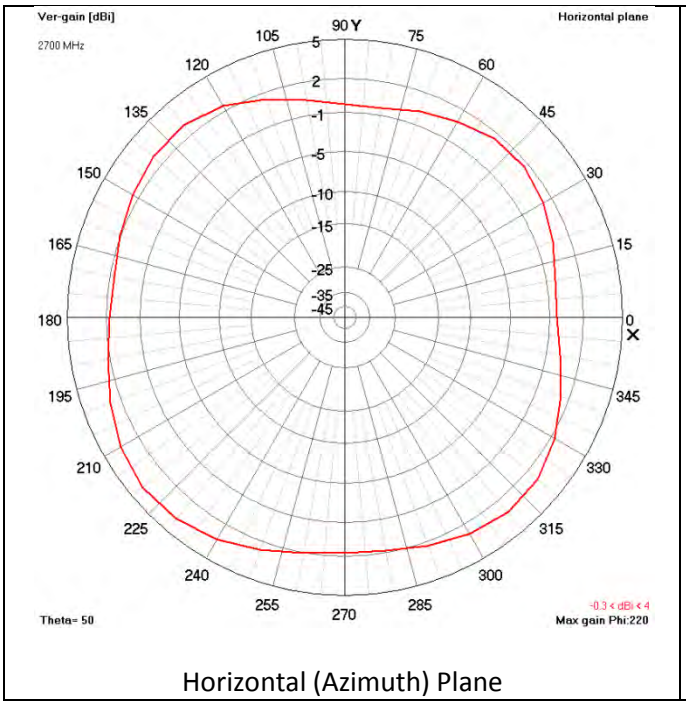
Vertical (Elevation) Plane



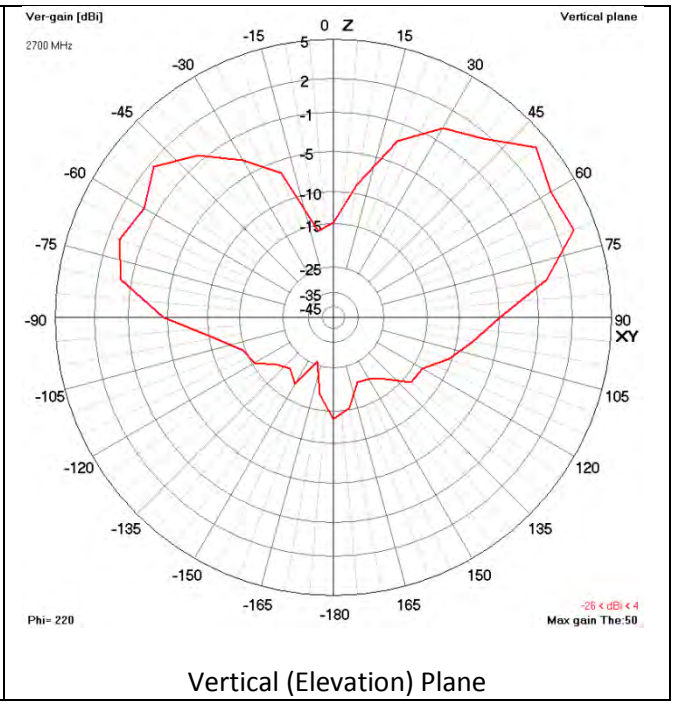
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Radiation Patterns

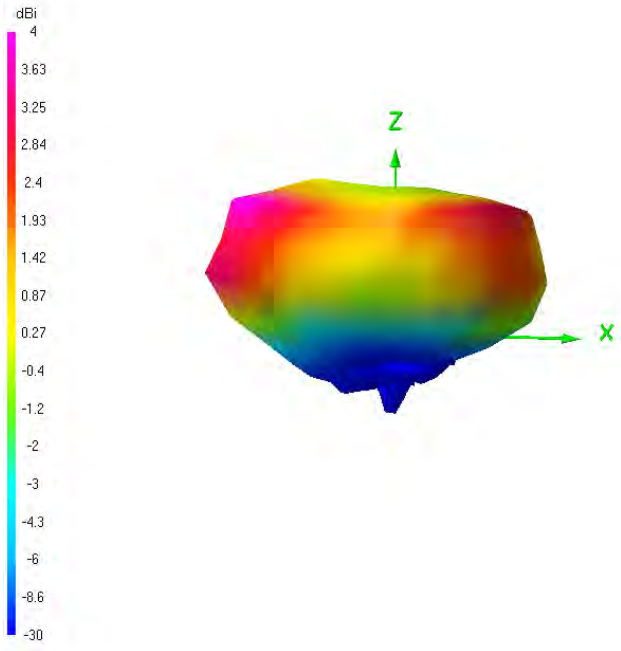
2700 MHz



Horizontal (Azimuth) Plane



Vertical (Elevation) Plane



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Installation Instructions

- Position away from:
  - CRT/TVs
  - Lighting fixtures & motors
  - Other antennas & wireless devices
  - Low-E or tinted/coated windows
  - Large vertical metal or concrete objects
- Drill a 5/8” (16mm) hole in flat horizontal surface
- Remove mounting nut & washer and feed coax cable through hole
- Remove bottom plastic liner to expose adhesive
- Press antenna into hole and tighten nut & washer from underneath
- Optionally apply a thin bead of silicone caulk around the antenna rim
- Use 2 identical antennas spaced 22 inches apart if modem supports diversity or MIMO
- Keep coax lead cable as short as possible & weatherproof all outdoor connectors

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution and information about Proxicast:

Web: www.proxicast.com **Tel:** 1-877-777-7694

Email: sales@proxicast.com 1-412-213-2477

Proxicast • 312 Sunnyfield Drive, Suite 200 • Glenshaw, PA 15116 USA

For technical questions and application information:

Email: support@proxicast.com

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SENSAPHONE®
REMOTE MONITORING SOLUTIONS

SENSAPHONE EXTERNAL ANTENNA • FGD-0261
Installation Instructions

The Sensaphone Sentinel now includes an external antenna for improved wireless performance. The antenna is supplied with a wall / mast mount bracket as standard but can also be mounted on metal panels or enclosures of sufficient size. Mount the antenna 6' or more from the Sentinel enclosure for best performance.



Bracket Mounting - Select a suitable mounting location for the antenna on the desired surface. The orientation of the antenna should be vertical with the cable exiting downwards. When selecting a mounting location care should be taken to ensure that at least 300mm (12") of separation is maintained between the antenna and nearby metal objects and surfaces.

When mounting the antenna to a metal housing, device enclosure or mast, care should be taken to ensure that the antenna housing is elevated above the metal surface to which it is mounted. Ensure that the selected location will enable the coaxial cable to be easily routed to the equipment. If mounting the antenna using screws it is important to check for adequate under panel clearance. It is important for RF performance that the antenna is only bracket mounted using the supplied bracket. Mounting the antenna utilizing a different bracket may adversely affect performance. The antenna can be mounted via the four 4.5mm fixing holes (suitable for M4 machine screws or 4mm self-tapping screws) or mast mounted using a jubilee or worm drive hose clip with a maximum width of 14mm (1/2"). If you will be drilling holes to mount the antenna, the bracket can be used as a drilling template.

When ready, mount the antenna securely to the bracket using the supplied nut and washer. It is not necessary to remove the backing from the supplied adhesive pad but the pad can be utilized if a more permanent fitment to the bracket is desired. If utilizing the adhesive pad, ensure that the top surface of the bracket is clean and dry, remove the backing from the adhesive pad and stick the antenna to the bracket applying firm pressure.

Panel Mounting - Select a suitable location. The antenna must be fitted to a conductive ground plane of adequate size. It will fit panels of between 1-12mm thick (0.04-0.47"). The recommended minimum diameter of the surface is 200mm (8"). Select a mounting location taking care to ensure that there is at least 300mm (12") of clearance from proximate metal objects. Ensure that there is adequate clearance under the mounting panel and measure to check for central positioning if necessary. Mask the panel area around the hole position to protect the surface / paintwork. Drill a pilot hole, then increase the hole size to 14mm (0.55"), ensuring that the drill / cutter bit does not hit any objects under the panel. Clean the area around the hole carefully removing all swarf. Remove any paint and primer from underneath the panel surface to ensure adequate electrical contact using washer and nut. Remove the nut and washer and then the adhesive pad backing from the underside of the antenna and feed the coaxial cable through the panel. Position the antenna over the mounting hole and stick it to the panel applying firm pressure. Assemble the nut and washer from under the panel and tighten fully.

Routing The Coaxial Cable - Route the coaxial cable to the Sentinel, taking care to avoid running adjacent to existing wiring or fouling any moving controls or components.

Saginaw Control and Engineering
95 Midland Road Saginaw, MI 48638-5770
(800) 234-6871 - Fax: (989) 799-4524
SCE@SaginawControl.com

SCE-24EL2008LP



Product Specifications:

Part Number: SCE-24EL2008LP
Description: EL Enclosure
Height: 24.00"
Width: 20.00"
Depth: 8.00"
Price Code: E3
List Price: $275.56
Catalog Page: 90
Est. Ship Weight: 42.00 lbs

Construction
- 0.075 In. carbon steel.
- Seams continuously welded and ground smooth.
- Flange trough collar around all sides of door opening.
- Pour in place oil & water resistant gasket
- Collar studs provided for mounting optional panels.
- Concealed hinges.
- Removable and interchangeable doors.
- Black quarter turn latches.
- Latches are opened or closed with a screwdriver.
- Mounting holes in back of enclosure.
- Mounting hardware, sealing washer and hole plug included.
- Removable print pocket furnished if height and width of enclosure is greater than 12 inches.
- Ground studs on door and body.

Application
Designed to house electrical and electronic controls, instruments and components. Provides protection from dust, oil and water. For outdoor application a drip shield is recommended.

Options
- Optional tamper-resistant inserts are available. - Optional mounting feet available. - Door hardware available. - Interchangeable latches and handles available in the accessory section.

Finish
ANSI-61 gray powder coating inside and out. Optional sub-panels are powder coated white.

Industry Standards - (IS4)
- NEMA Type 3R, 4, 12 and Type 13
- UL Listed Type 3R, 4 and 12
- CSA Type 3R, 4 and 12
- IEC 60529
- IP 66

Notes
Provision for Lifting Lugs will be included on enclosures with Height >48" and with Depth >16". The Lifting Lug assembly will be included with the enclosure bolt pack.

Special Instructions apply for IS3, IS4 and IS6 to maintain the environmental rating of Type 3R for these parts. Instructions are located on the enclosure door. Drip shield is required on IS3, drip shield is recommended on IS4 and IS6. Drain holes are required on all.

Optional Accessories
SCE-24P20 Subpanel, Bent
SCE-24P20GALV Subpanel, Bent Galvannealed
SCE-BVK Breather Vent
SCE-DF24EL20LP Panel, Dead Front (Wall Mount)
SCE-DS20N4 Shield, Drip
SCE-ELFM20W EL Flush Mount Frame
SCE-ELFM24H EL Flush Mount Frame
SCE-ELMFK4 Foot Kit, EL Mounting (4pc.)
SCE-ELSP3 KIT, Swing-Out Panel (20 High & Up)

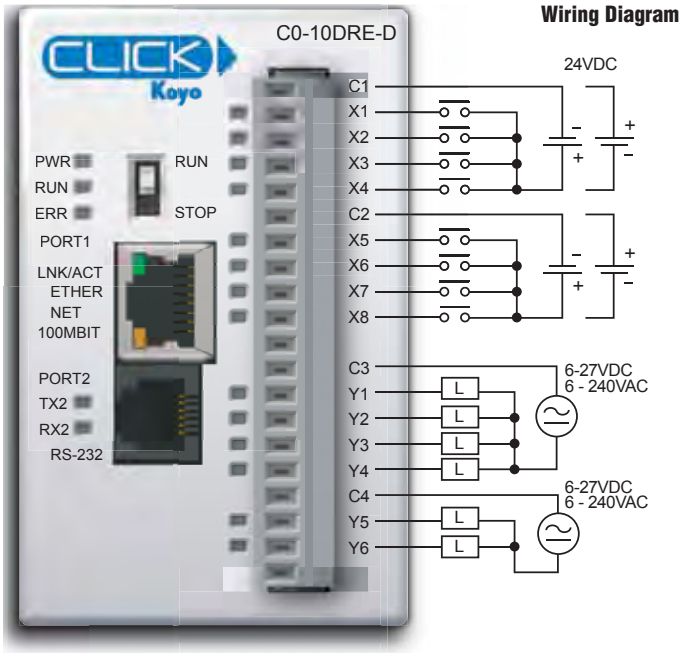
Similar Part Numbers
SCE-12EL1206LPEL Enclosure
SCE-12EL2406LPEL Enclosure
SCE-12EL2408LPEL Enclosure
SCE-16EL1206LPEL Enclosure
SCE-16EL1208LPEL Enclosure
SCE-16EL1408LPEL Enclosure
SCE-16EL1606LPEL Enclosure
SCE-16EL1608LPEL Enclosure
SCE-16EL2006LPEL Enclosure
SCE-16EL2008LPEL Enclosure

Installation Information
- Mounting Foot Kit for Enviroline Enclosures
- Sealing Washer Specifications
- EL Flush Mount Frame
- Drip Shield Kit Assembly
- Dead Front Wall Mount Installation Instructions
- Swing Panel Assembly for Enviroline Enclosures
- Swing Panel ELSP for Encl. Height > 16
- Dead Front Wall Mount < 20 In Height Installation Instructions
- Swing Panel ELSP for Encl. Height <= 16
- Service Parts Wall Mount Enclosures

Ethernet Basic PLC

C0-10DRE-D

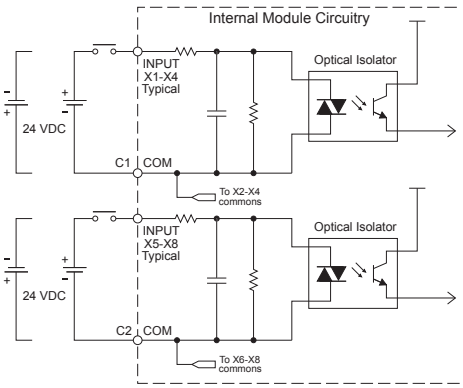
8 DC Input/6 Relay Output Micro PLC



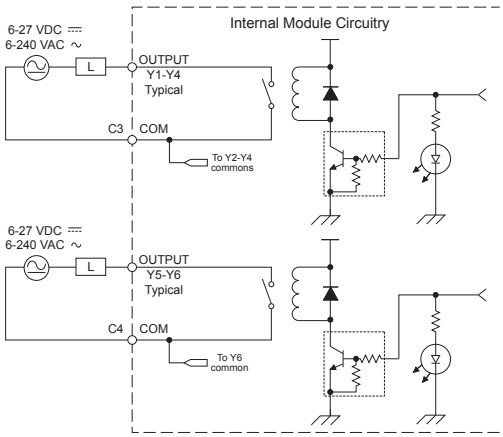
Wiring Diagram

NOTE: When using Ethernet Basic PLCs, you must use CLICK programming software version V2.00 or later.

Equivalent Input Circuit



Equivalent Output Circuit

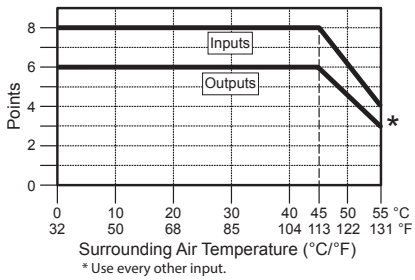


Built-in I/O Specifications - Inputs	
Inputs per Module	8 (Sink/Source)
Operating Voltage Range	24 VDC
Input Voltage Range	21.6-26.4 VDC
Input Current	X1-4: Typ 6.5 mA @ 24 VDC X5-8: Typ 4 mA @ 24 VDC
Maximum Input Current	X1-4: 7.0 mA @ 26.4 VDC X5-8: 5.0 mA @ 26.4 VDC
Input Impedance	X1-4: 3.9 kΩ @ 24 VDC X5-8: 6.8 kΩ @ 24 VDC
ON Voltage Level	> 19 VDC
OFF Voltage Level	X1-4: < 2 VDC X5-8: < 7 VDC
Minimum ON Current	X1-4: 4.5 mA X5-8: 3.5 mA
Maximum OFF Current	X1-4: 0.5 mA X5-8: 1.5 mA
OFF to ON Response	X1-4: Typ 5 µs Max 20 µs X5-8: Typ 2 ms Max 10 ms
ON to OFF Response	X1-4: Typ 5 µs Max 20 µs X5-8: Typ 3 ms Max 10 ms
Status Indicators	Logic Side (8 points, green LED)
Commons	2 (4 points/common) Isolated

Built-in I/O Specifications - Outputs	
Outputs per Module	6
Operating Voltage Range	6-240 VAC (47-63 Hz), 6-27 VDC
Output Voltage Range	5-264 VAC (47-63 Hz), 5-30 VDC
Output Type	Relay, form A (SPST)
Maximum Current	1 A/point; C3: 4 A/common, C4: 2 A/common
Minimum Load Current	5 mA @ 5 VDC
Maximum Inrush Current	3 A for 10 ms
OFF to ON Response	< 15 ms
ON to OFF Response	< 15 ms
Status Indicators	Logic Side (6 points, red LED)
Commons	2 (4 points/com & 2 points/com) Isolated

General Specifications	
Current Consumption at 24VDC	120 mA
Terminal Block Replacement Part No.	C0-16TB
Weight	5.6 oz (160 g)

C0-10DRE-D Temperature Derating Chart



* Use every other input.

Typical Relay Life (Operations) at Room Temperature	
Voltage & Load Type	**Relay Life**
30 VDC 1A Resistive	300,000 cycles
30 VDC 1A Solenoid	50,000 cycles
250 VAC 1A Resistive	500,000 cycles
250 VAC 1A Solenoid	200,000 cycles
ON to OFF = 1 cycle	

***ZIP*Link Pre-Wired PLC Connection Cables and Modules**



ZL-RTB20 20-pin feed-through connector module

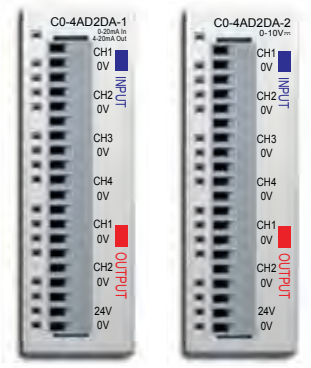


20-pin connector cable
ZL-C0-CBL20 (0.5 m length)
ZL-C0-CBL20-1 (1.0 m length)
ZL-C0-CBL20-2 (2.0 m length)

Choosing Expansion I/O Modules

Analog I/O Modules (continued)

Analog Combo I/O Modules



C0-4AD2DA-1 C0-4AD2DA-2

Analog Combo I/O Modules			
Part Number	**Analog Input Type**	**Analog Output Type**	**External Power Required**
C0-4AD2DA-1	4 channel, current (0-20 mA), 13 bit	2 channel, current sourcing (4-20 mA), 12 bit	24 VDC
C0-4AD2DA-2	4 channel, voltage (0-10 V), 13 bit	4 channel, voltage (0-10 V), 12 bit	24 VDC

General Specifications For All CLICK PLC Products

These general specifications apply to all CLICK PLCs, optional I/O modules, and optional power supply products. Please refer to the appropriate I/O temperature derating charts under both the PLC and I/O module specifications to determine best operating conditions based on the ambient temperature of your particular application.

General Specifications	
Power Input Voltage Range	20–28 VDC
Maximum Power Consumption	5W (No 5V use from communication port)
Maximum Inrush Current	30A (less than 1ms)
Acceptable External Power Drop	Max 10ms
Operating Temperature	Analog, analog combo I/O modules only: 32°F to 140°F (0°C to 60°C); All other modules: 32°F to 131°F (0°C to 55°C), IEC 60068-2-14 (Test Nb, Thermal Shock)
Storage Temperature	–4°F to 158°F (–20°C to 70°C) IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)
Ambient Humidity	30% to 95% relative humidity (non–condensing)
Environmental Air	No corrosive gases. Environmental pollution level is 2 (UL840)
Vibration	MIL STD 810C, Method 514.2, EC60068-2-6 JIS C60068-2-6 (Sine wave vibration test)
Shock	MIL STD 810C, Method 516.2, IEC60068-2-27, JIS C60068-2-27
Noise Immunity	Comply with NEMA ICS3-304, Impulse noise 1µs, 1000V EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB) EN61000-4-5 (Surge), EN61000-4-6 (Conducted) EN61000-4-8 (Power frequency magnetic field immunity) RFI: No interference measured at 150 and 450 MHz (5w/15cm)
Emissions	EN55011:1998 Class A
Agency Approvals	UL508 (File No. E157382, E316037); CE (EN61131-2)
Other	RoHS

CLICK Specifications

PLC Unit Specifications

Basic, Standard and Analog PLC Unit Specifications			
	Basic PLC	**Standard PLC**	**Analog PLC**
Control Method	Stored Program/Cyclic execution method	Stored Program/Cyclic execution method	Stored Program/Cyclic execution method
I/O Numbering System	Fixed in Decimal	Fixed in Decimal	Fixed in Decimal
Ladder Memory (steps)	8000	8000	8000
Total Data Memory (words)	8000	8000	8000
Contact Execution (boolean)	< 0.6us	< 0.6us	< 0.6us
Typical Scan (1k boolean)	1-2 ms	1-2 ms	1-2 ms
RLL Ladder Style Programming	Yes	Yes	Yes
Run Time Edits	No	No	No
Scan	Variable / fixed	Variable / fixed	Variable / fixed
CLICK Programming Software for Windows	Yes	Yes	Yes
Built-in Communication Ports	Yes (two RS-232 ports)	Yes (two RS-232 ports and one RS-485 port)	Yes (two RS-232 ports and one RS-485 port)
FLASH Memory	Standard on PLC	Standard on PLC	Standard on PLC
Built-in Discrete I/O points	8 inputs, 6 outputs	8 inputs, 6 outputs	4 inputs, 4 outputs
Built-in Analog I/O Channels	No	No	2 inputs, 2 outputs
Number of Instructions Available	21	21	21
Control Relays	2000	2000	2000
System Control Relays	1000	1000	1000
Timers	500	500	500
Counters	250	250	250
Interrupt	Yes (external: 8 / timed: 4)	Yes (external: 8 / timed: 4)	Yes (external: 4 / timed: 4)
Subroutines	Yes	Yes	Yes
For/Next Loops	Yes	Yes	Yes
Math (Integer and Hex)	Yes	Yes	Yes
Drum Sequencer Instruction	Yes	Yes	Yes
Internal Diagnostics	Yes	Yes	Yes
Password Security	Yes	Yes	Yes
System Error Log	Yes	Yes	Yes
User Error Log	No	No	No
Memory Backup	Super Capacitor	Super Capacitor + Battery	Super Capacitor + Battery
Battery Backup	No	Yes (battery sold separately; part # D2-BAT-1)	Yes (battery sold separately; part # D2-BAT-1)
Calendar/Clock	No	Yes	Yes
I/O Terminal Block Replacement	ADC p/n C0-16TB	ADC p/n C0-16TB	ADC p/n C0-16TB
Communication Port & Terminal Block Replacement	N/A	ADC p/n C0-3TB	ADC p/n C0-3TB
24 VDC Power Terminal Block Replacement	ADC p/n C0-4TB	ADC p/n C0-4TB	ADC p/n C0-4TB

CLICK Specifications

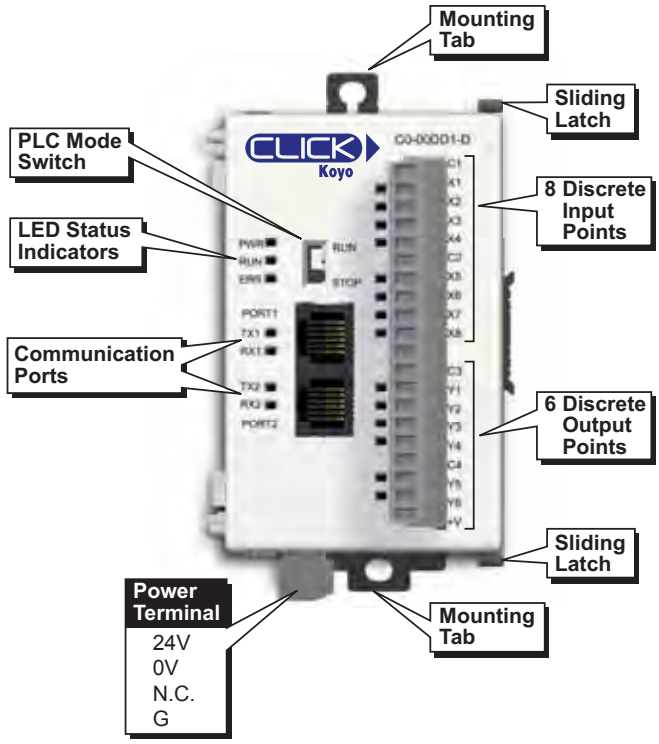
PLC Units Specifications (continued)

Ethernet Basic, Standard and Analog PLC Unit Specifications			
	Ethernet Basic PLC	**Ethernet Standard PLC**	**Ethernet Analog PLC**
Control Method	Stored Program/Cyclic execution method	Stored Program/Cyclic execution method	Stored Program/Cyclic execution method
I/O Numbering System	Fixed in Decimal	Fixed in Decimal	Fixed in Decimal
Ladder Memory (steps)	8000	8000	8000
Total Data Memory (words)	8000	8000	8000
Contact Execution (boolean)	< 0.2 µs	< 0.2 µs	< 0.2 µs
Typical Scan (1k boolean)	< 1ms	< 1ms	< 1ms
RLL Ladder Style Programming	Yes	Yes	Yes
Run Time Edits	Yes	Yes	Yes
Scan	Variable / fixed	Variable / fixed	Variable / fixed
CLICK Programming Software for Windows	Yes	Yes	Yes
Built-in Communication Ports	Yes (one Ethernet port and one RS-232 port)	Yes (one Ethernet port, one RS-232 port and one RS-485 port)	Yes (one Ethernet port, one RS-232 port and one RS-485 port)
FLASH Memory	Standard on PLC	Standard on PLC	Standard on PLC
Built-in Discrete I/O points	8 inputs, 6 outputs	8 inputs, 6 outputs	4 inputs, 4 outputs
Built-in Analog I/O Channels	No	No	2 or 4 inputs; 2 outputs
Number of Instructions Available	21	21	21
Control Relays	2000	2000	2000
System Control Relays	1000	1000	1000
Timers	500	500	500
Counters	250	250	250
Interrupt	Yes (external: 8 / timed: 4)	Yes (external: 8 / timed: 4)	Yes (external: 8 / timed: 4)
Subroutines	Yes	Yes	Yes
For/Next Loops	Yes	Yes	Yes
Math (Integer and Hex)	Yes	Yes	Yes
Drum Sequencer Instruction	Yes	Yes	Yes
Internal Diagnostics	Yes	Yes	Yes
Password Security	Yes	Yes	Yes
System Error Log	Yes	Yes	Yes
User Error Log	No	No	No
Memory Backup	Super Capacitor + Battery	Super Capacitor + Battery	Super Capacitor + Battery
Battery Backup	Yes (battery part # D2-BAT-1)	Yes (battery part # D2-BAT-1)	Yes (battery part # D2-BAT-1)
Calendar/Clock	Yes	Yes	Yes
I/O Terminal Block Replacement	ADC p/n C0-16TB	ADC p/n C0-16TB	ADC p/n C0-16TB
Communication Port & Terminal Block Replacement	N/A	ADC p/n C0-3TB	ADC p/n C0-3TB
24 VDC Power Terminal Block Replacement	ADC p/n C0-4TB	ADC p/n C0-4TB	ADC p/n C0-4TB

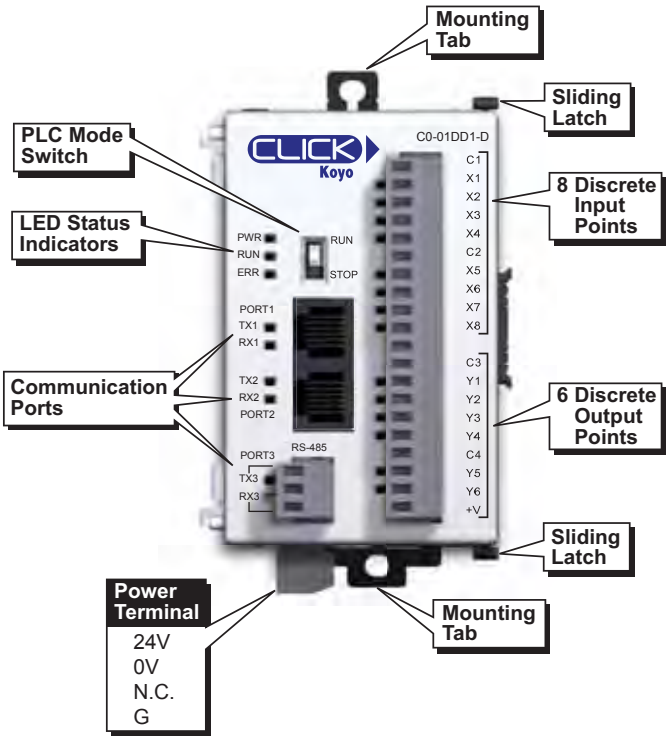
CLICK Specifications

PLC Features

Basic PLCs



Standard PLCs



Analog PLCs



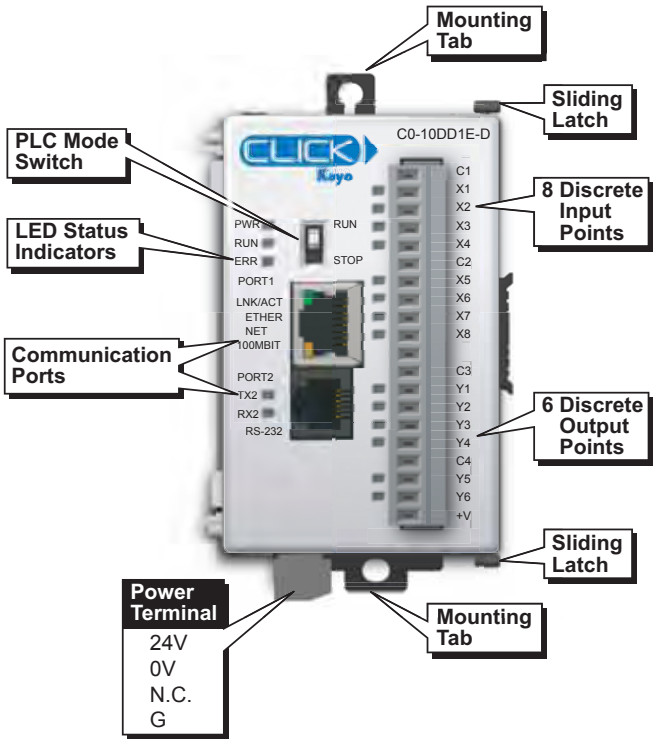
Bottom of PLC (Same on all models)



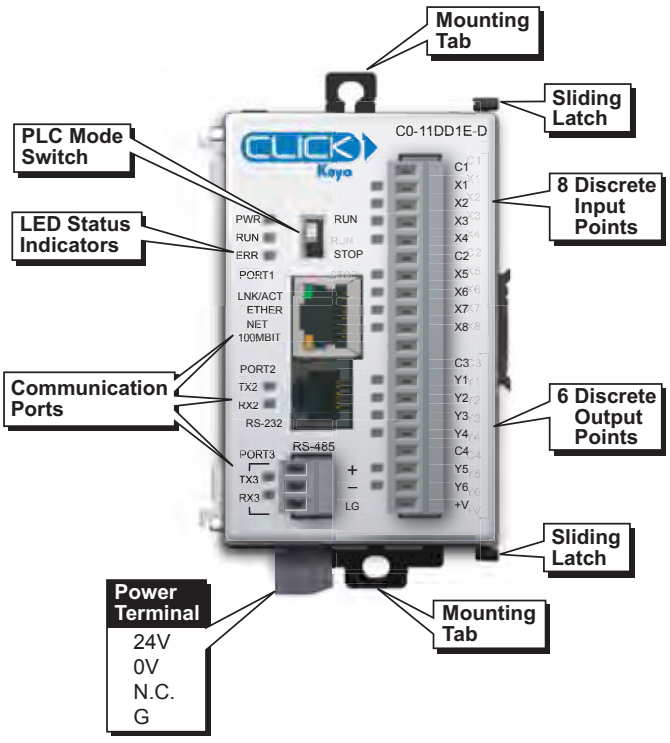
CLICK Specifications

PLC Features (continued)

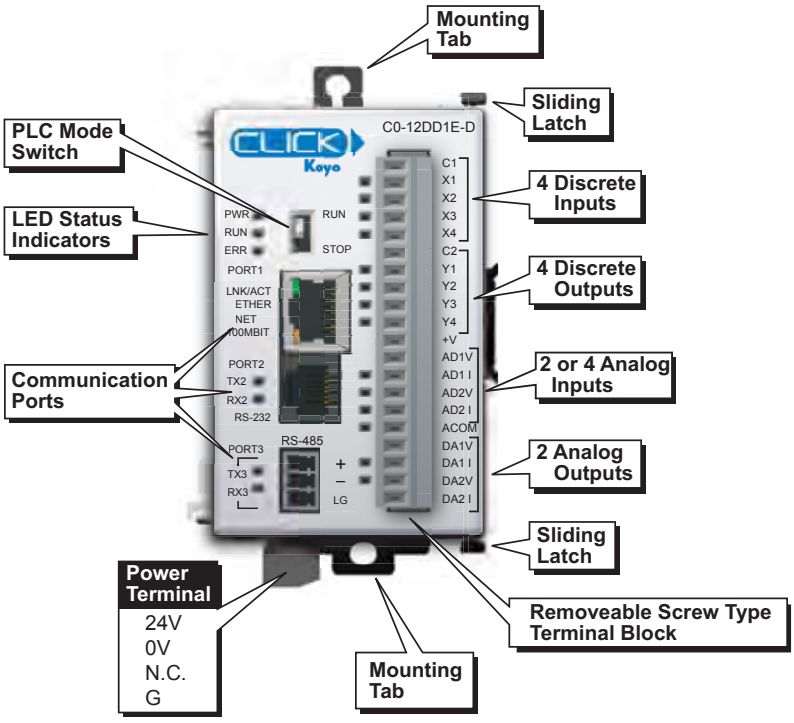
Ethernet Basic PLCs



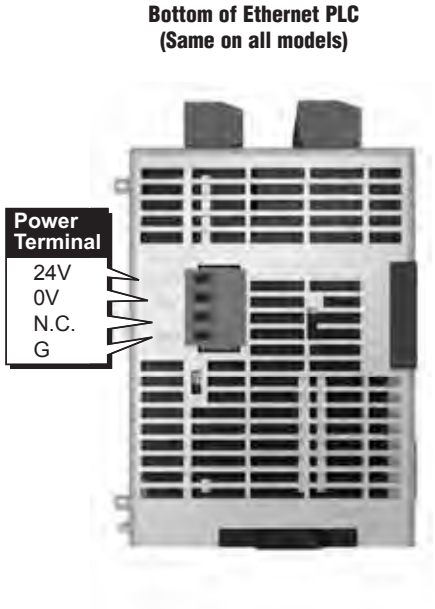
Ethernet Standard PLCs



Ethernet Analog PLCs



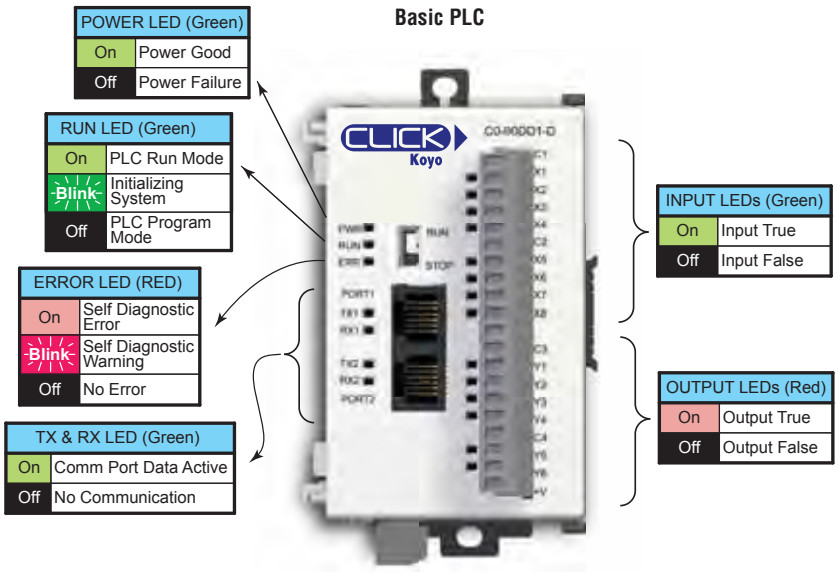
Bottom of Ethernet PLC (Same on all models)



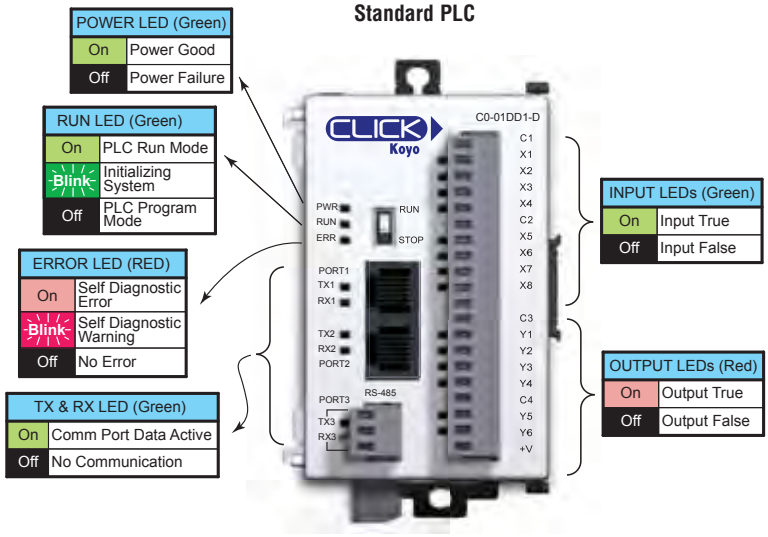
CLICK Specifications

PLC LED Status Indicators

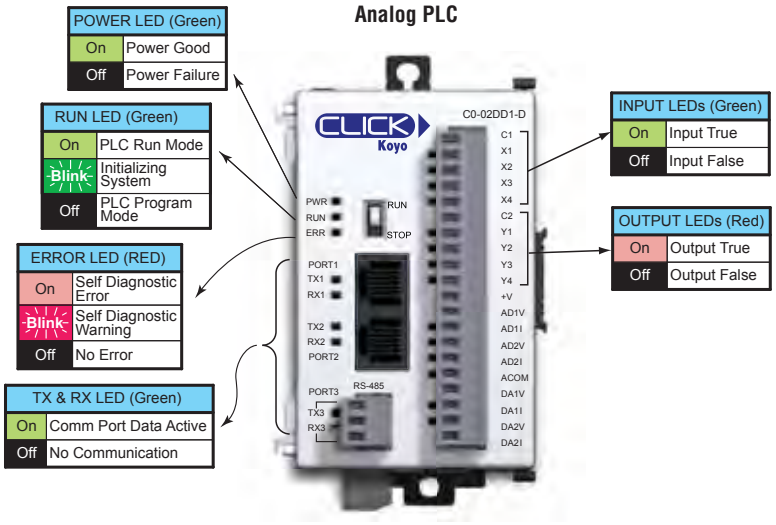
Basic PLC



Standard PLC



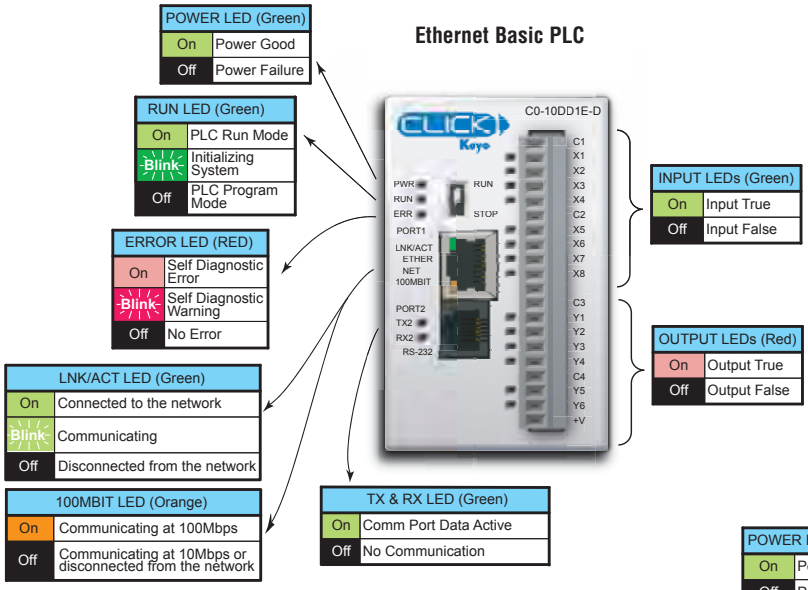
Analog PLC



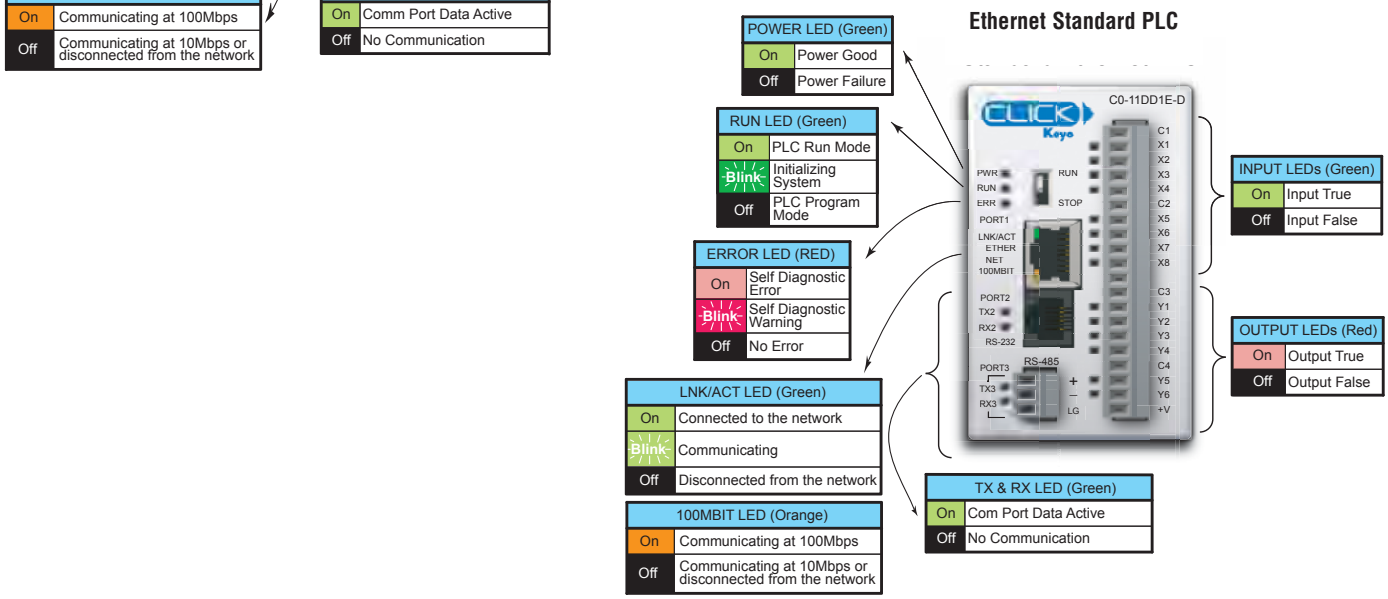
CLICK Specifications

PLC LED Status Indicators

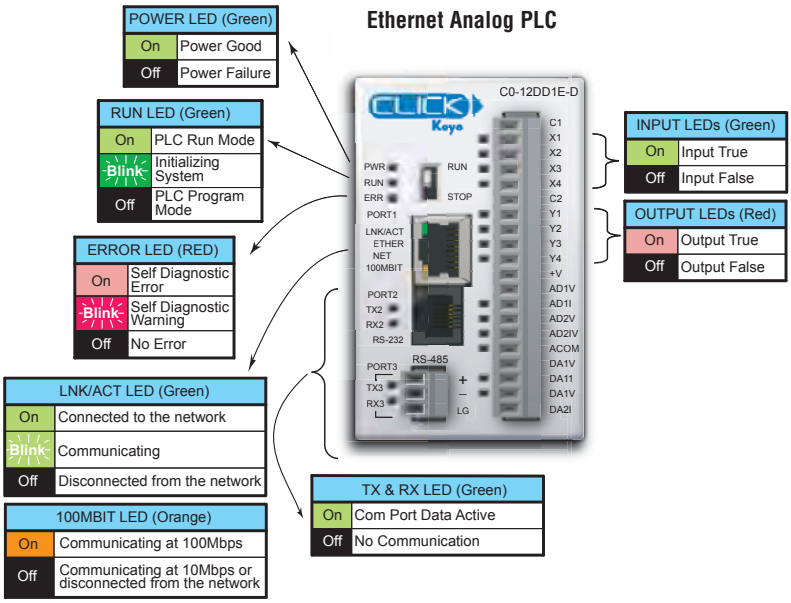
Ethernet Basic PLC



Ethernet Standard PLC



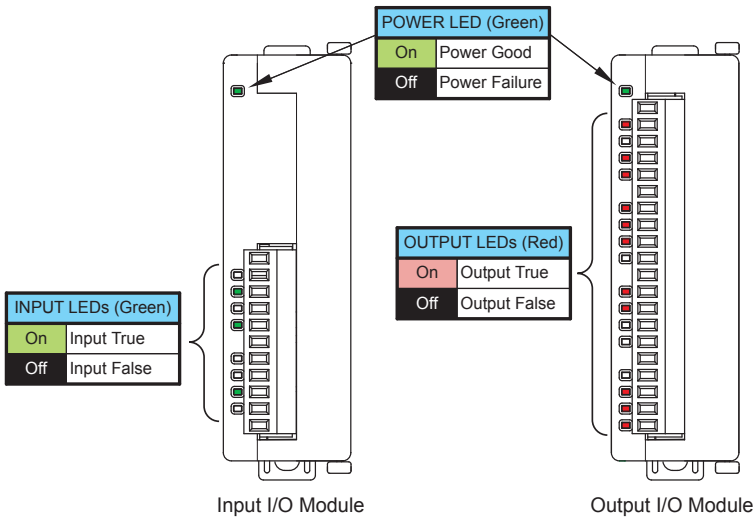
Ethernet Analog PLC



CLICK Specifications

I/O Module LED Status Indicators

I/O Module LED Status Indicators



Note: There are no LED indications on the Analog I/O modules.

I/O Terminal Block Specifications for PLCs and I/O Modules



11-Pin Terminal Block, C0-8TB

11-pin Terminal Block Specifications	
Connector Type	Pluggable Terminal Block
Number of Pins	11
Pitch	3.50 mm
Wire Range	28–16 AWG
Wire Strip Length	7 mm
Screw Size	M2.0
Screw Torque	Analog, analog combo I/O modules only: 1.7 lb·in; All other modules: 2.0 to 2.2 lb·in
ADC Part Number	C0-8TB



20-Pin Terminal Block, C0-16TB

20-pin Terminal Block Specifications	
Connector Type	Pluggable Terminal Block
Number of Pins	20
Pitch	3.50 mm
Wire Range	28-16 AWG
Wire Strip Length	7 mm
Screw Size	M2.0
Screw Torque	Analog, analog combo I/O modules only: 1.7 lb·in; All other modules: 2.0 to 2.2 lb·in
ADC Part Number	C0-16TB

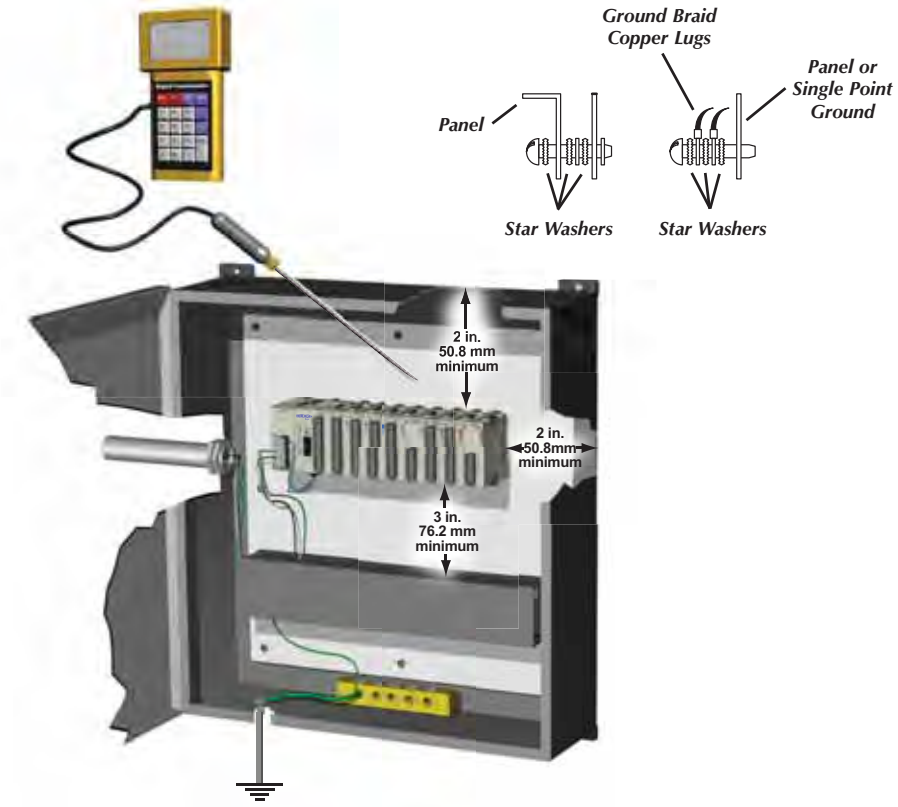
Product Dimensions and Installation

It is important to understand the installation requirements for your CLICK system. Your knowledge of these requirements will help ensure that your system operates within its environmental and electrical limits.

Plan for Safety

This catalog should never be used as a replacement for the user manual.

You can purchase, download free, or view online the user manuals for these products. Manual C0-USER-M is the user manual for the CLICK PLC. The user manual contains important safety information that must be followed. The system installation should comply with all appropriate electrical codes and standards.

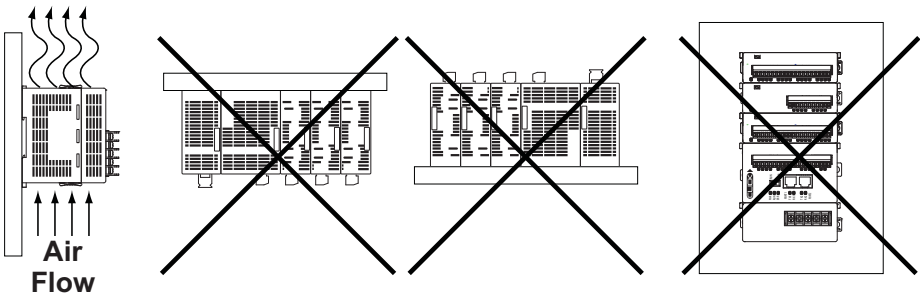


NOTE: THERE IS A MIMIMUM CLEARANCE REQUIREMENT OF 2 INCHES(51 MM) BETWEEN THE CLICK PLC AND THE PANEL DOOR OR ANY DEVICES MOUNTED IN THE PANEL DOOR. THE SAME CLEARANCE IS REQUIRED BETWEEN THE PLC AND ANY SIDE OF THE ENCLOSURE. A MINIMUM CLEARANCE OF 3 INCHES (76 MM) IS REQUIRED BETWEEN THE PLC AND A WIREWAY OR ANY HEAT PRODUCING DEVICE.



Mounting Orientation

CLICK PLCs must be mounted properly to ensure ample airflow for cooling purposes. It is important to follow the unit orientation requirements and to verify that the PLC's dimensions are compatible with your application. Notice particularly the grounding requirements and the recommended cabinet clearances.

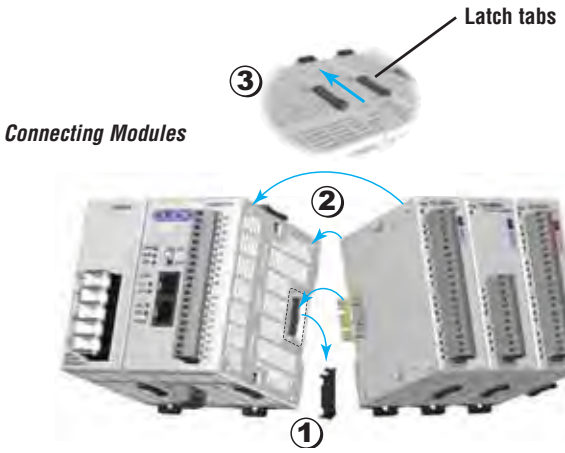


Product Dimensions and Installation

Connecting the Modules Together

CLICK PLCs, I/O modules and power supplies connect together using the extension ports that are located on the side panels of the modules (no PLC backplane/base required).

1. Remove extension port covers and slide the latch tabs forward.
2. Align the module pins and connection plug, and press the I/O module onto the right side of the PLC.
3. Slide the latch tabs backward to lock the modules together.



Connecting Modules



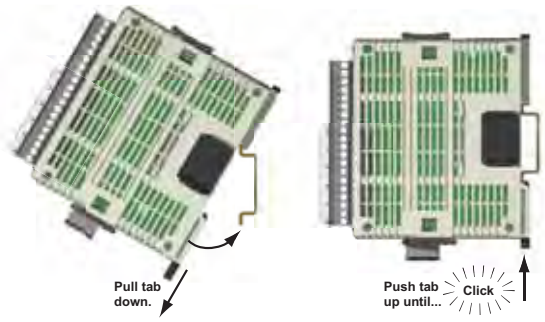
Supports up to eight I/O modules

Mounting

The CLICK PLC system, which includes the CLICK power supplies, PLC units, and I/O modules, can be mounted in one of two ways.

1. DIN rail mounted
2. Surface mounted using the built-in upper and lower mounting tabs.

DIN Rail Mounting



Surface Mounting



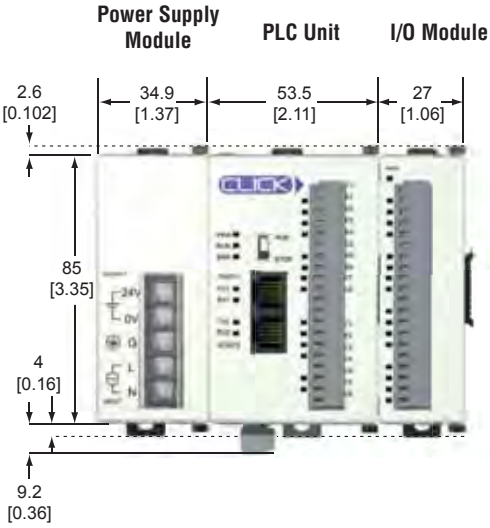
Unit Dimensions

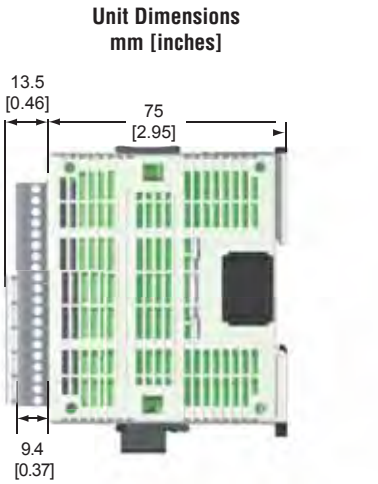
The dimensional drawings here and on the next page show the outside dimensions of the CLICK power suppy, PLC, and I/O modules. The CLICK PLC system is designed to be mounted on standard 35mm DIN rail, or it can be surface mounted.

Allow proper spacing from other components within an enclosure.

Maximum system:

Power Supply + PLC + 8 I/O modules.



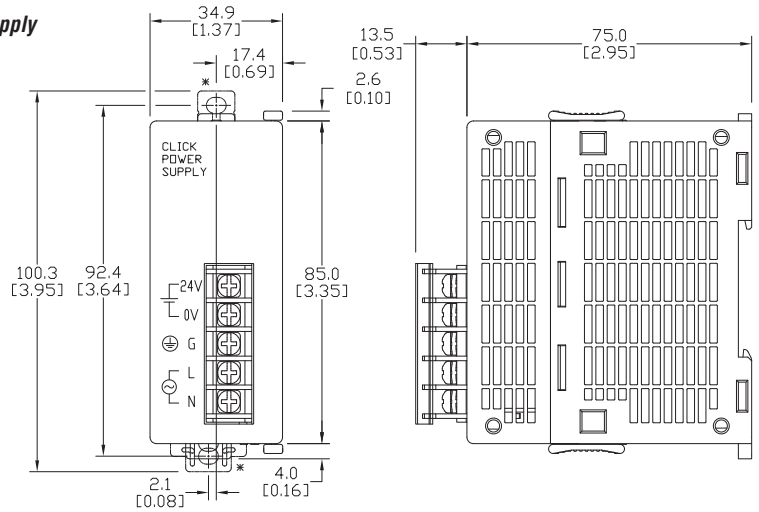


Product Dimensions and Installation

Unit Dimensions

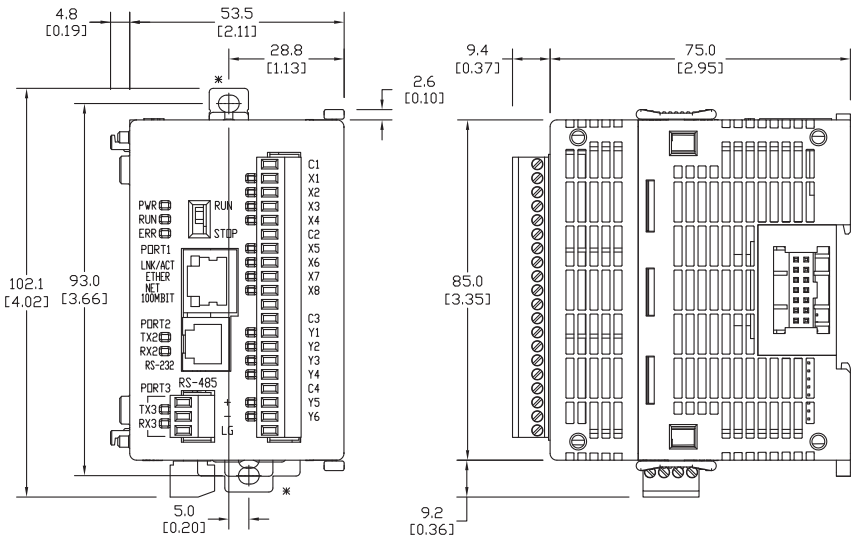
mm [inches]

Power Supply



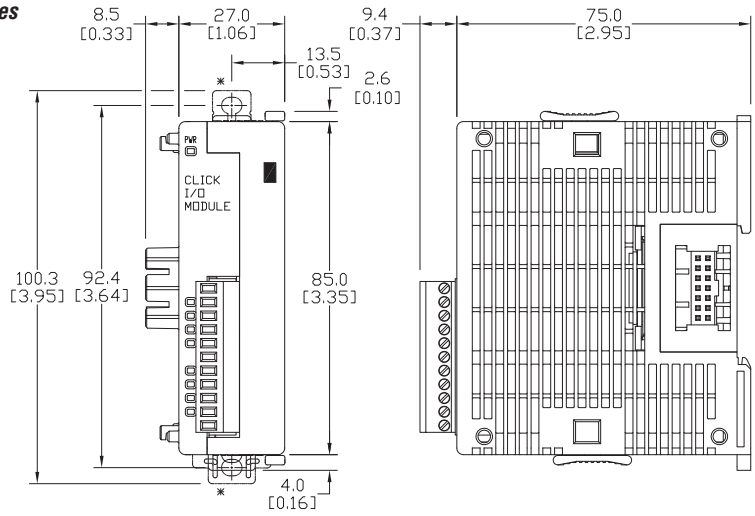
*Use size M4 screws for tab mounting.

PLC Units



*Use size M4 screws for tab mounting.

I/O Modules



*Use size M4 screws for tab mounting.

Networking the CLICK PLC

Built-in Communications Ports

Basic, Standard and Analog PLCs have two built-in RS-232 communications ports. Standard and Analog PLCs also have one built-in RS-485 communications port. One RS-232 port supports the Modbus RTU protocol only and can be used as the programming port. The other ports support either Modbus RTU or ASCII protocol. Both RS-232 ports supply 5V DC, so you can connect a monochrome C-more Micro HMI panel without an additional power supply.

LED Status Indicators

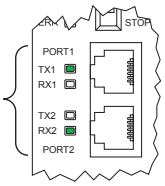
There are LED indicators located to the left of each communications port to indicate when the port is transmitting or receiving.

Basic PLCs

Port 1 & 2 LED Status Indicators

TX1 and TX2 (Green)	
On	The Comm Port is sending data.
Off	The Comm Port is not sending data.

RX1 and RX2 (Green)	
On	The Comm Port is receiving data.
Off	The Comm Port is not receiving data.

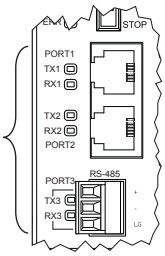


Standard and Analog PLCs

Port 1, 2, & 3 LED Status Indicators

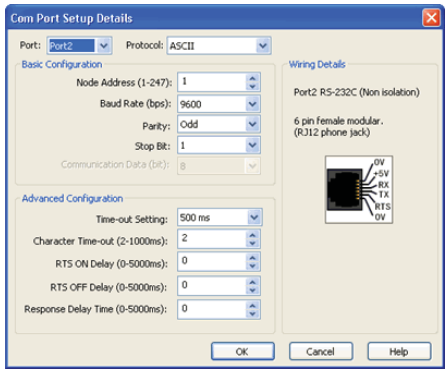
TX1, TX2 and TX3 (Green)	
On	The Comm Port is sending data.
Off	The Comm Port is not sending data.

RX1, RX2 and RX3 (Green)	
On	The Comm Port is receiving data.
Off	The Comm Port is not receiving data.



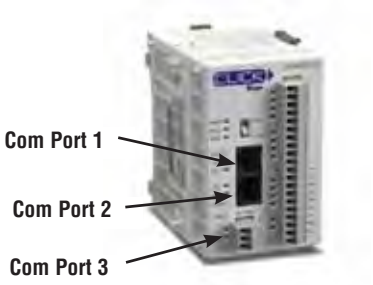
Port Setup

Use CLICK programming software to easily configure the communications ports.





Basic PLC

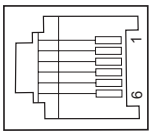


Standard and Analog PLCs

Com Port 1 Specifications
Use: Programming Port / Serial Communications (Slave only)
Physical: 6 pin, RJ12, RS-232
Communication speed (baud): 38400 (fixed)
Parity: Odd
Station Address: 1
Data length: 8 bits
Stop bit: 1
Protocol: Modbus RTU (slave only)

Port 1

6 pin RJ12 Phone Type Jack

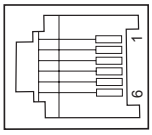


Port 1 Pin Descriptions		
1	0V	Power (-) connection (GND)
2	5V	Power (+) connection
3	RXD	Receive data (RS-232)
4	TXD	Transmit data (RS-232)
5	NC	No connection
6	0V	Power (-) connection (GND)

Com Port 2 Specifications	Default
Use: Serial Communications	-
Physical: 6 pin, RJ12, RS-232	-
Communication speed (baud): 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	38400
Parity: odd, even, none	Odd
Station Address: 1 to 247	1
Data length: 8 bits (Modbus RTU) or 7, 8 bits (ASCII)	8 bits
Stop bit: 1,2	1
Protocol: Modbus RTU (master/slave) or ASCII in/out	Modbus RTU

Port 2

6 pin RJ12 Phone Type Jack

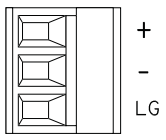


Port 2 Pin Descriptions		
1	0V	Power (-) connection (GND)
2	5V	Power (+) connection
3	RXD	Receive data (RS-232)
4	TXD	Transmit data (RS-232)
5	RTS	Request to send
6	0V	Power (-) connection (GND)

Com Port 3 Specifications	Default
Use: Serial Communications	-
Physical: 3 pin, RS-485	-
Communication speed (baud): 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	38400
Parity: odd, even, none	Odd
Station Address: 1 to 247	1
Data length: 8 bits (Modbus RTU) or 7, 8 bits (ASCII)	8 bits
Stop bit: 1,2	1
Protocol: Modbus RTU (master/slave) or ASCII in/out	Modbus RTU

Port 3

RS-485

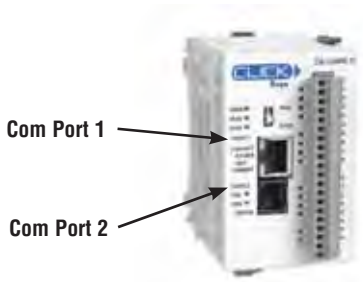


Port 3 Pin Descriptions		
1	+ (plus)	Signal A (RS-485)
2	- (minus)	Signal B (RS-485)
3	LG	Logic Ground(0 V)

Networking the CLICK PLC

Built-in Communications Ports

Ethernet Basic, Standard and Analog PLCs have one built-in Ethernet communications port and one RS-232 communications port. Ethernet Standard and Analog PLCs also have one built-in RS-485 communications port. The Ethernet port supports the Modbus TCP protocol. The RS-232 and RS-485 ports support either Modbus RTU or ASCII protocol. The RS-232 port supplies 5 VDC, so you can connect a monochrome C-more Micro HMI panel without an additional power supply.



Ethernet Basic PLC



Ethernet Standard and Ethernet Analog PLCs

LED Status Indicators

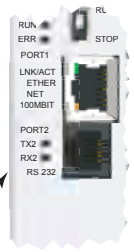
There are LED indicators located to the left of each communication port to indicate when the port is transmitting or receiving.

Ethernet Basic PLCs

Port 1 & 2 LED Status Indicators

LNK/ACT LED (Green)	
On	Connected to the network
Blink	Communicating
Off	Disconnected from the network

100MBIT LED (Orange)	
On	Communicating at 100Mbps
Off	Communicating at 10Mbps or disconnected from the network



TX2 (Green)	
On	The Comm Port is sending data.
Off	The Comm Port is not sending data.

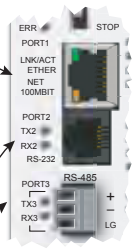
RX2 (Green)	
On	The Comm Port is receiving data.
Off	The Comm Port is not receiving data.

Ethernet Standard and Ethernet Analog PLCs

Port 1, 2 & 3 LED Status Indicators

LNK/ACT LED (Green)	
On	Connected to the network
Blink	Communicating
Off	Disconnected from the network

100MBIT LED (Orange)	
On	Communicating at 100Mbps
Off	Communicating at 10Mbps or disconnected from the network



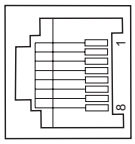
TX2 and TX3 (Green)	
On	The Comm Port is sending data.
Off	The Comm Port is not sending data.

RX2 and RX3 (Green)	
On	The Comm Port is receiving data.
Off	The Comm Port is not receiving data.

Com Port 1 Specifications
Use: Programming and Ethernet Communication
Physical: 8 pin, RJ45, Ethernet
Communication speed (Mbps): 10/100
Protocol: Modbus TCP

Port 1

8 pin RJ45

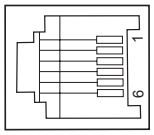


Port 1 Pin Descriptions		
1	TX+	Transmit Data (+)
2	TX-	Transmit Data (-)
3	RX+	Receive data (+)
4	NC	Not connected
5	NC	Not connected
6	RX-	Receive Data (-)
7	NC	No connection
8	NC	No connection

Com Port 2 Specifications	Default
Use: Serial Communication	-
Physical: 6 pin, RJ12, RS-232	-
Communication speed (baud): 2400, 4800, 9600, 19200, 38400, 57600, 115200	38400
Parity: odd, even, none	Odd
Station Address: 1 to 247	1
Data length: 8 bits (Modbus RTU) or 7, 8 bits (ASCII)	8 bits
Stop bit: 1,2	1
Protocol: Modbus RTU (master/slave) or ASCII in/out	Modbus RTU

Port 2

6 pin RJ12 Phone Type Jack

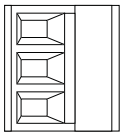


Port 2 Pin Descriptions		
1	0V	Power (-) connection (GND)
2	5V	Power (+) connection
3	RXD	Receive data (RS-232)
4	TXD	Transmit data (RS-232)
5	RTS	Request to send
6	0V	Power (-) connection (GND)

Com Port 3 Specifications	Default
Use: Serial Communication	-
Physical: 3 pin, RS-485	-
Communication speed (baud): 2400, 4800, 9600, 19200, 38400, 57600, 115200	38400
Parity: odd, even, none	Odd
Station Address: 1 to 247	1
Data length: 8 bits (Modbus RTU) or 7, 8 bits (ASCII)	8 bits
Stop bit: 1,2	1
Protocol: Modbus RTU (master/slave) or ASCII in/out	Modbus RTU

Port 3

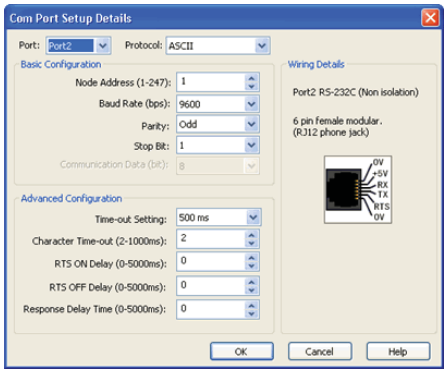
RS-485



Port 3 Pin Descriptions		
1	+ (plus)	Signal A (RS-485)
2	- (minus)	Signal B (RS-485)
3	LG	Logic Ground(0 V)

Port Setup

Use CLICK programming software to easily configure the communication ports.



Networking the CLICK PLC

Typical Communication Applications

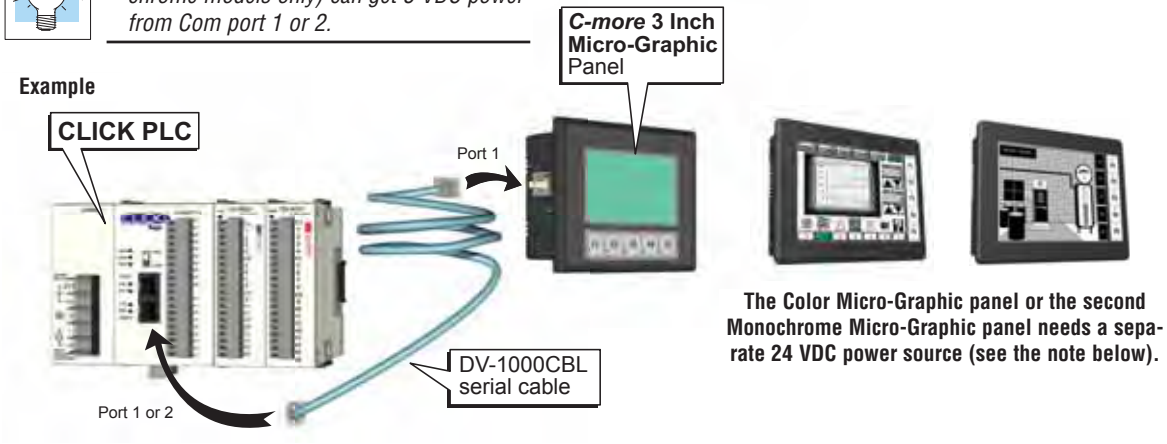
The diagrams on these three pages illustrate the typical uses for the CLICK PLC's communication ports.

Port 1 (RS-232) – Modbus RTU Slave Mode Only



C-more Micro-Graphic panels (monochrome models only) can get 5 VDC power from Com port 1 or 2.

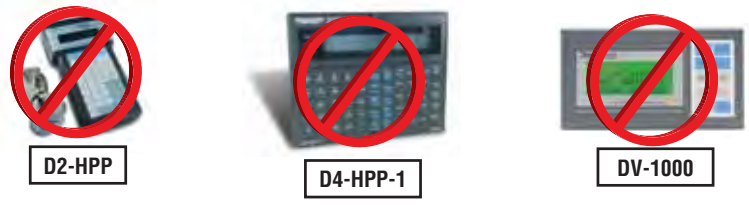
Example



NOTE: *CLICK's (RS-232) Port 1 and Port 2 can provide 5 VDC power to the panel, but not at the same time. If a C-more Micro-Graphic panel is connected to both ports, then at least one of the panels must be powered by a C-more Micro DC power adapter, EA-MG-P1 or EA-MG-SP1, or another 24 VDC power source. Color C-more Micro-Graphic panels must also be powered from a separate 24 VDC source.*

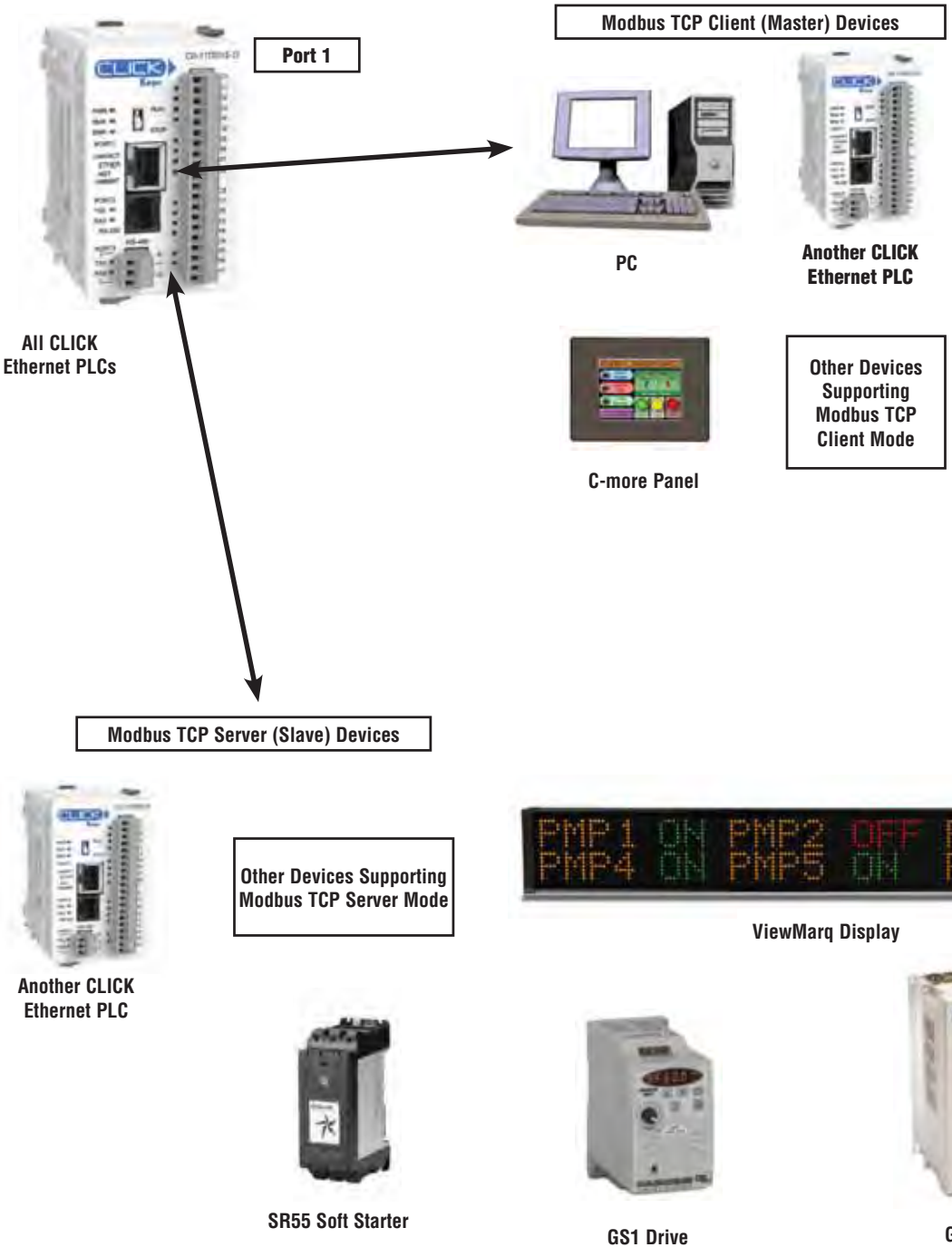
Do not use the following *Direct*LOGIC devices with CLICK's Port 1 or 2:

WARNING: The following *Direct*LOGIC PLC devices cannot be used with a CLICK PLC's Port 1 or Port 2:
Handheld Programmer for DL05, DL06, DL105, DL205 & D3-350 CPUs, p/n D2-HPP
Handheld Programmer for DL405 CPUs, p/n D4-HPP-1
Timer/Counter Access for DL05, DL06, DL105, DL205, DL405 & D3-350 CPUs, p/n DV-1000



Networking the CLICK PLC

Port 1 (Ethernet) – Modbus TCP

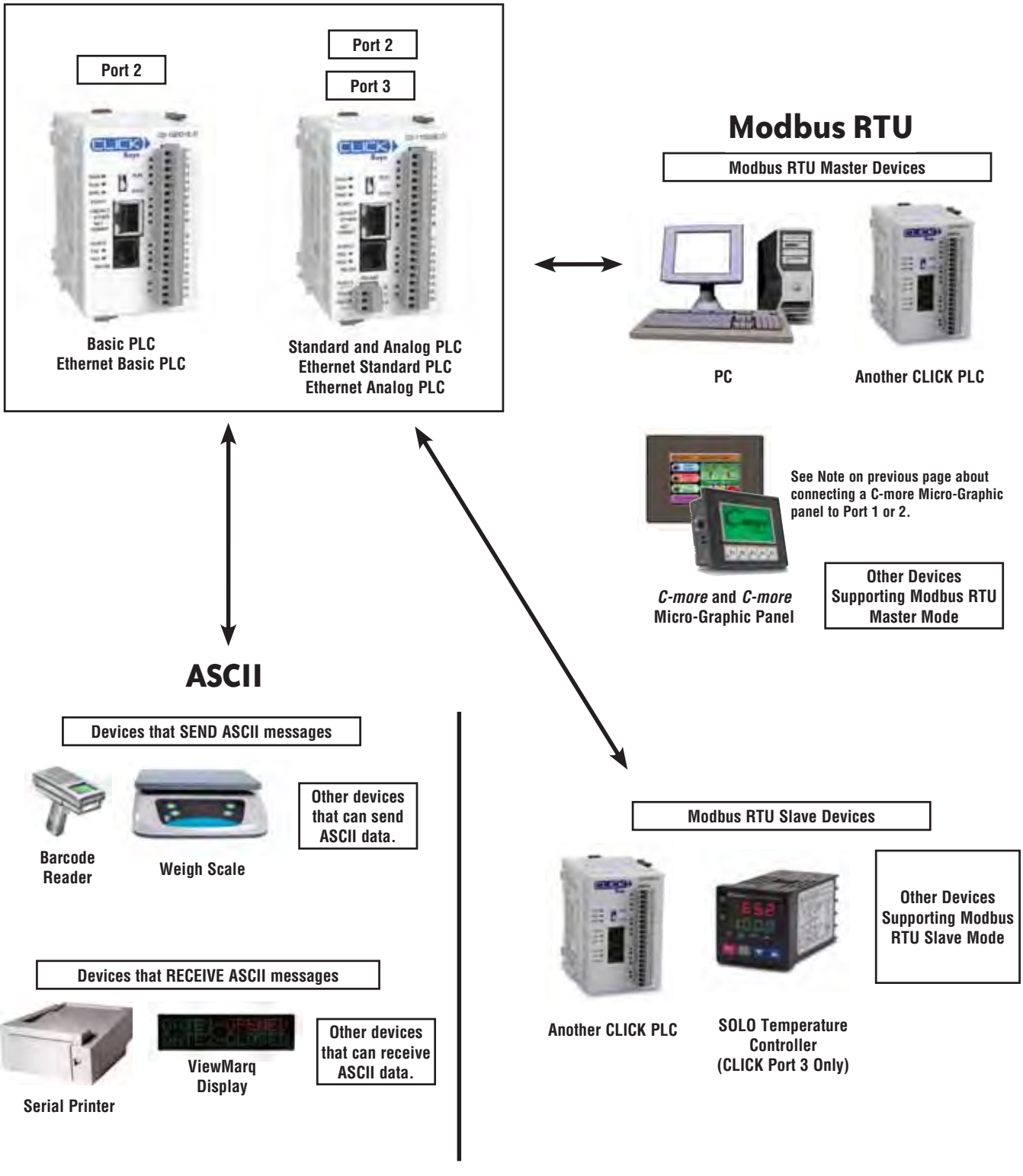


Networking the CLICK PLC

Port 2 (RS-232) – Modbus RTU or ASCII

Port 3 (RS-485; Standard, Analog, Ethernet Standard and Ethernet Analog PLCs) – Modbus RTU or ASCII

All PLCs have RS-232 port 2, but only Standard, Analog, Ethernet Standard and Ethernet Analog PLCs have RS-485 port 3. Ports 2 and 3 allow networking to similar devices.



Power Supplies

Power Supplies

The CLICK PLC family offers two 24 VDC power supplies. They are identical except for the output current.

It is not mandatory to use one of these CLICK power supplies for the CLICK PLC system. You can use any other 24 VDC power supply that Automationdirect.com offers, including the PSP24-DC12-1 12 VDC to 24 VDC converter shown below.

C0-00AC Power Supply

Limited auxiliary AC power supply allows you to power the 24 VDC CLICK C0 series PLCs with 100-240 VAC supply power. The 0.5A DC power supply is capable of controlling the PLC plus a limited configuration based on the power budget of each I/O module. The C0-00AC is a low-cost solution for applications requiring only minimal I/O and power consumption. This power supply will not support a fully-populated CLICK PLC system with all possible I/O module combinations.

C0-01AC Power Supply

Expanded auxiliary AC power supply allows you to power the 24 VDC CLICK C0 series PLCs with 100-240 VAC supply power. The 1.3A DC power supply is capable of supporting a fully-populated CLICK PLC system with all possible I/O module combinations, with no concerns for exceeding the power budget.

PSP24-DC12-1 DC-DC Converter

With this DC-DC converter you can operate the CLICK PLC with 12 VDC input power.

CLICK 24 VDC Power Supply Ratings		
Part Number	**Output Current**	**Price**
C0-00AC	0.5 A	$29.00
C0-01AC	1.3 A	$39.00

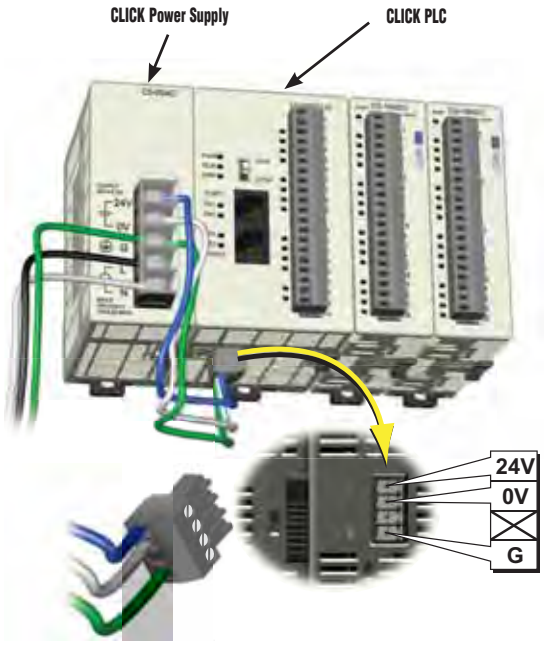
C0-00AC Power Supply Specifications	
Input Voltage Range	85-264 VAC
Input Frequency	47-63 Hz
Input Current (typical)	0.3 A @ 100 VAC, 0.2 A @ 200 VAC
Inrush Current	30 A
Output Voltage Range	23-25 VDC
Output Current	0.5 A
Over Current Protection	@ 0.65 A (automatic recovery)
Weight	5.3 oz (150g)

C0-01AC Power Supply Specifications	
Input Voltage Range	85-264 VAC
Input Frequency	47-63 Hz
Input Current (typical)	0.9 A @ 100 VAC, 0.6 A @ 200 VAC
Inrush Current	30 A
Output Voltage Range	23-25 VDC
Output Current	1.3 A
Over Current Protection	@ 1.6 A (automatic recovery)
Weight	6.0 oz (170g)

PSP24-DC12-1 DC-DC Converter Specifications	
Input Voltage Range	9.5-18 VDC
Input Power (no load)	1.0 W max.
Startup Voltage	8.4 VDC
Undervoltage Shutdown	7.6 VDC
Output Voltage Range	24-28 VDC (adjustable)
Output Current	1.0 A
Short Circuit Protection	Current limited at 110% typical
Weight	7.5 oz (213g)



PSP24-DC12-1



24 VDC power is supplied to the PLC unit through wiring connected from the power supply output to the 4-pin 24 VDC input connector located on the bottom of the PLC unit.

C0-00AC



24 VDC Output Power Terminals (for CLICK PLC, I/O or field device, etc.)

85-264 VAC Power Source Input Terminals

C0-01AC



24 VDC Output Power Terminals (for CLICK PLC, I/O or field device, etc.)

85-264 VAC Power Source Input Terminals

Power Budgeting

Power Budgeting

There are two areas to be considered when determining the power required to operate a CLICK PLC system. The first area is the power required by the CLICK PLC, along with the internal logic side power that the CPU provides to its own I/O and any connected I/O modules that are powered through the PLC expansion port; plus any device, such as a C-more Micro-Graphic panel, that is powered through one of the communications ports.

The second area is the power required by all externally connected I/O devices. This should be viewed as the field side power required. The field side power is dependent on the voltage used for a particular input or output device as it relates to the wired I/O point, and the calculated load rating of the connected device.

It is strongly recommended that the power source for the logic side be separate from the power source for the field side to help eliminate possible electrical noise.

Power budgeting requires the calculation of the total current the 24 VDC power source needs to provide to CLICK's logic side, and also a separate calculation of the total current required for all devices operating from the field side of the PLC system.

Refer to the Power Budgeting example shown on the following page. The table shows required current for a CLICK PLC, two I/O modules, and a C-more Micro. Use the total amperage values to select the properly sized power supply.



CLICK 24 VDC Power Supply
C0-00AC or C0-01AC



Other 24 VDC Power Supply
Example: PSP24-60S

Power Consumption for CLICK PLC Units

PLC Current Consumption (mA)		
Part Number	**Power Budget 24 VDC (logic side)**	**External 24 VDC (field side)**
Basic PLC Units		
C0-00DD1-D	120	60
C0-00DD2-D	120	0
C0-00DR-D		
C0-00AR-D		
Standard PLC Units		
C0-01DD1-D	140	60
C0-01DD2-D	140	0
C0-01DR-D		
C0-01AR-D		
Analog PLC Units		
C0-02DD1-D	140	60
C0-02DD2-D	140	0
C0-02DR-D		
Ethernet Basic PLC Units		
C0-10DD1E-D	120	60
C0-10DD2E-D	120	0
C0-10DRE-D		
C0-10ARE-D		
Ethernet Standard PLC Units		
C0-11DD1E-D	140	60
C0-11DD2E-D	140	0
C0-11DRE-D		
C0-11ARE-D		

PLC Current Consumption (mA)		
Part Number	**Power Budget 24 VDC (logic side)**	**External 24 VDC (field side)**
Ethernet Analog PLC Units		
C0-12DD1E-D	140	60
C0-12DD2E-D		0
C0-12DRE-D	160	
C0-12ARE-D		
C0-12DD1E-1-D	140	60
C0-12DD2E-1-D		0
C0-12DRE-1-D	160	
C0-12ARE-1-D		
C0-12DD1E-2-D	140	60
C0-12DD2E-2-D		0
C0-12DRE-2-D	160	
C0-12ARE-2-D	140	

Power Budgeting

Power Consumption for CLICK I/O Expansion Modules

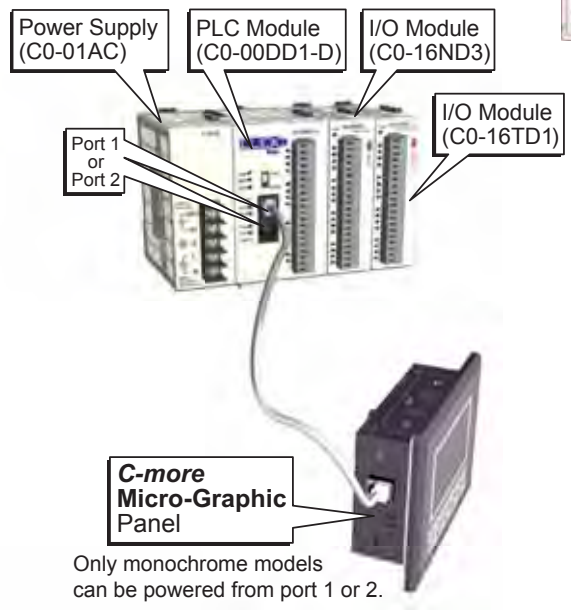
I/O Module Current Consumption (mA)		
Part Number	Power Budget 24 VDC (logic side)	External 24 VDC (field side)
Discrete Input Modules		
C0-08ND3	30	0
C0-08ND3-1	30	0
C0-16ND3	40	0
C0-08NE3	30	0
C0-16NE3	40	0
C0-08NA	30	0
Discrete Output Modules		
C0-08TD1	50	15
C0-08TD2	50	0
C0-16TD1	80	100
C0-16TD2	80	0
C0-08TA	80	0
C0-04TRS	100	0
C0-08TR	100	0

I/O Module Current Consumption (continued) (mA)		
Part Number	Power Budget 24 VDC (logic side)	External 24 VDC (field side)
Discrete Combo I/O Modules		
C0-16CDD1	80	50
C0-16CDD2	80	0
C0-08CDR	80	0
Analog Input Modules		
C0-04AD-1	20	65
C0-04AD-2	23	65
C0-04RTD	25	0
C0-04THM	25	0
Analog Output Modules		
C0-04DA-1	20	145
C0-04DA-2	20	85
Analog Combo I/O Modules		
C0-4AD2DA-1	25	75
C0-4AD2DA-2	20	65
C-more Micro-Graphic Panel		
Monochrome only	90	0

Power Budgeting Using the CLICK Programming Software

The CLICK Programming software can also be used for power budgeting. Based on the amperage rating of the power supply selected in the first column, your power budget is calculated by subtracting each consecutive module's power consumption from the total available power budget. If you exceed the maximum allowable power consumption the power budget row is highlighted in red.





Power Budgeting Example

Current Consumption (mA) Example		
Part Number	Power Budget 24 VDC (logic side)	External 24 VDC (field side)
C0-00DD1-D	120	60
C0-16ND3	40	0
C0-16TD1	80	100
C-more Micro	90	0
Total:	330	160*
* Add in calculated load of connected I/O devices.		

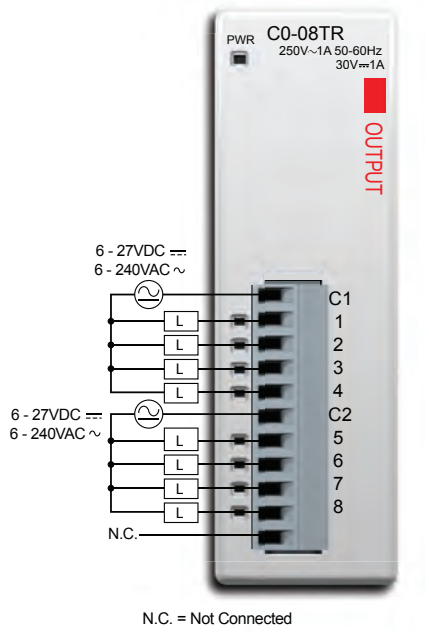
CLICK I/O Module Specifications

C0-08TR

8-Point Relay Output Module

8-point 6-240 VAC/6-27 VDC relay output module, 8 Form A (SPST) relays, 2 commons, isolated, 1 A/point, removable terminal block included (replacement ADC p/n C0-08TB).

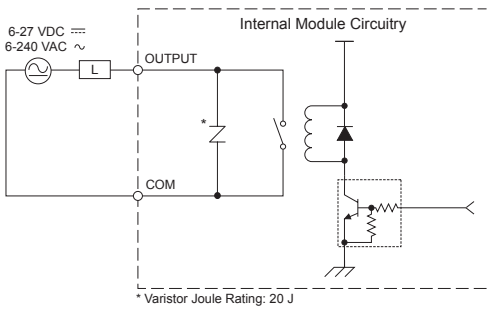
Wiring Diagram



N.C. = Not Connected

Output Specifications	
Outputs per Module	8
Operating Voltage Range	6-27 VDC / 6-240 VAC
Output Voltage Range	5-30 VDC / 5-264 VAC
Output type	Relay, form A (SPST)
AC Frequency	47-63 Hz
Maximum Current (resistive)	1 A/point, 4 A/common
Minimum Load Current	5 mA @ 5 VDC
Maximum Leakage Current	0.1 mA @ 264 VAC
Maximum Inrush Current	3 A for 10 ms
OFF to ON Response	< 15 ms
ON to OFF Response	< 15 ms
Status Indicators	Logic Side (8 points, red LED) Power Indicator (green LED)
Commons	2 (4 points/common) Isolated
Bus Power Required (24 VDC)	Max. 100 mA (All Outputs On)
Protection Circuit	Not built into the module - Install protection elements such as external fuse
Terminal Block Replacement	ADC p/n C0-8TB
Weight	3.9 oz (110 g)

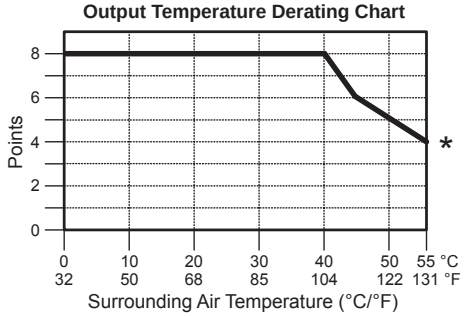
Equivalent Output Circuit



* Varistor Joule Rating: 20 J

Typical Relay Life (Operations) at Room Temperature	
Voltage & Load Type	**Load Current: 1 A**
30 VDC Resistive	300,000 cycles
30 VDC Solenoid	50,000 cycles
250 VAC Resistive	500,000 cycles
250 VAC Solenoid	200,000 cycles
ON to OFF = 1 cycle	

Output Temperature Derating Chart



* Use every other output.

***ZIP*Link Pre-Wired PLC Connection Cables and Modules**



ZL-RTB20 20-pin feed-through connector module



11-pin connector cable
ZL-C0-CBL11 (0.5 m length)
ZL-C0-CBL11-1 (1.0 m length)
ZL-C0-CBL11-2 (2.0 m length)

Product data sheet
Characteristics

ZB5AS844
red Ø40 Emergency stop, switching off head Ø22 trigger and latching turn release

Green Premium

Product availability: Stock - Normally stocked in distribution facility
Price*: 92.50 USD



Main

Range of product	Harmony XB5
Product or component-type	Head
Product destination	Emergency stop push-button
Device short name	ZB5
Bezel material	Plastic
Head type	Standard
Mounting diameter	0.87 in (22 mm)
Sale per indivisible-quantity	1
Shape of signaling unit-head	Round
Type of operator	Trigger action and mechanical latching
Reset	Turn to release
Operator profile	Red mushroom Ø 40 mm unmarked

Complementary

CAD overall width	1.57 in (40 mm)
CAD overall height	1.57 in (40 mm)
CAD overall depth	2.24 in (57 mm)
Product weight	0.1 lb(US) (0.046 kg)
Mechanical durability	300000 cycles
Main group	E-stop
Group of product	Emergency stop turn to release
Station name	XALD 1 cut-out XALK 1 cut-out
Cap/operator or lens colour	Red
Marking	Unmarked
Electrical composition code	C11 <= 3 contacts using single blocks in front mounting C15 1 contacts using single blocks in front mounting SF1 <= 3 contacts using single blocks in front mounting SR1 <= 3 contacts using single blocks in rear mounting C7 <= 4 contacts using single blocks in front mounting C8 <= 4 contacts using single and double blocks in front mounting C10 <= 4 contacts using single and double blocks in front mounting
Compatibility code	ZB5

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein.
This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications.
It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof.
Neither Schneider Electric Industries SAS nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. *Prices are indicative

Environment

Protective treatment	TH
Ambient air temperature for storage	-40...158 °F (-40...70 °C)
Ambient air temperature for operation	-40...158 °F (-40...70 °C)
Overvoltage category	Class II conforming to IEC 60536
IP degree of protection	IP69 IP67 IP66 conforming to IEC 60529 IP69K
NEMA degree of protection	NEMA 13 NEMA 4X
Resistance to high pressure washer	1015.26 psi (7000000 Pa) at 131 °F (55 °C),distance: 0.1 m
IK degree of protection	IK03 conforming to IEC 50102
Standards	EN/IEC 60204-1 EN/IEC 60947-1 EN/IEC 60947-5-1 EN/IEC 60947-5-4 EN/IEC 60947-5-5 EN/ISO 13850 IEC 60364-5-53 JIS C 4520 UL 508 GB 14048.5 CSA C22.2 No 14
Product certifications	BV CSA DNV GL LROS (Lloyds register of shipping) RINA UL listed
Vibration resistance	5 gn (f = 2...500 Hz) conforming to IEC 60068-2-6
Shock resistance	30 gn (duration = 18 ms) half sine wave acceleration conforming to IEC 60068-2-27 50 gn (duration = 11 ms) half sine wave acceleration conforming to IEC 60068-2-27

Ordering and shipping details

Category	22467 - PUSHBUTTONS,22MM(PLASTIC) NEW
Discount Schedule	CS2
GTIN	00785901376682
Nbr. of units in pkg.	1
Package weight(Lbs)	8.9999999999999997E-2
Returnability	Y
Country of origin	CZ

Offer Sustainability

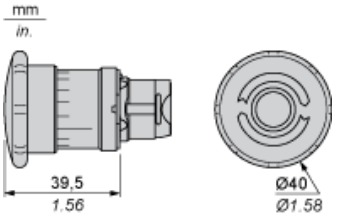
Sustainable offer status	Green Premium product
RoHS (date code: YYWW)	Compliant - since 0627 - Schneider Electric declaration of conformity Schneider-Electric declaration of conformity
REACh	Reference not containing SVHC above the threshold
Product end of life instructions	Need no specific recycling operations

Contractual warranty

Warranty period	18 months

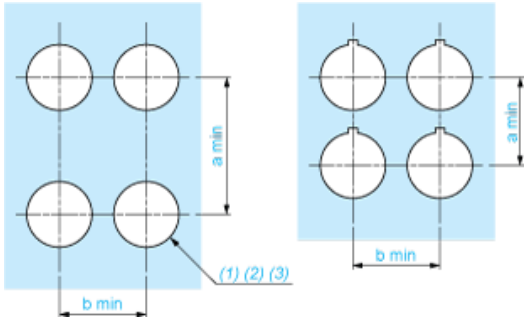
ZB5AS844

Dimensions



Panel Cut-out for Pushbuttons, Switches and Pilot Lights (Finished Holes, Ready for Installation)

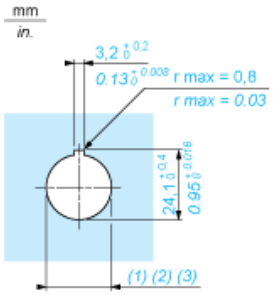
Connection by Screw Clamp Terminals or Plug-in Connectors or on Printed Circuit Board



(1) Diameter on finished panel or support
(2) For selector switches and Emergency stop buttons, use of an anti-rotation plate type ZB5AZ902 is recommended.
(3) Ø22.5 mm recommended (Ø22.3 $_{0}^{+0.4}$) / Ø0.89 in. recommended (Ø0.88 in. $_{0}^{+0.016}$)

Connections	a in mm	a in in.	b in mm	b in in.
By screw clamp terminals or plug-in connector	40	1.57	30	1.18
By Faston connectors	45	1.77	32	1.26
On printed circuit board	30	1.18	30	1.18

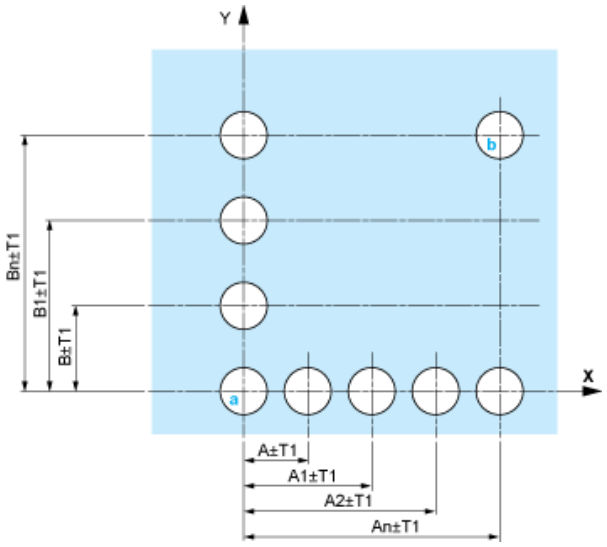
Detail of Lug Recess



(1) Diameter on finished panel or support
(2) For selector switches and Emergency stop buttons, use of an anti-rotation plate type ZB5AZ902 is recommended.
(3) Ø22.5 mm recommended (Ø22.3 $_{0}^{+0.4}$) / Ø0.89 in. recommended (Ø0.88 in. $_{0}^{+0.016}$)

Pushbuttons, Switches and Pilot Lights for Printed Circuit Board Connection

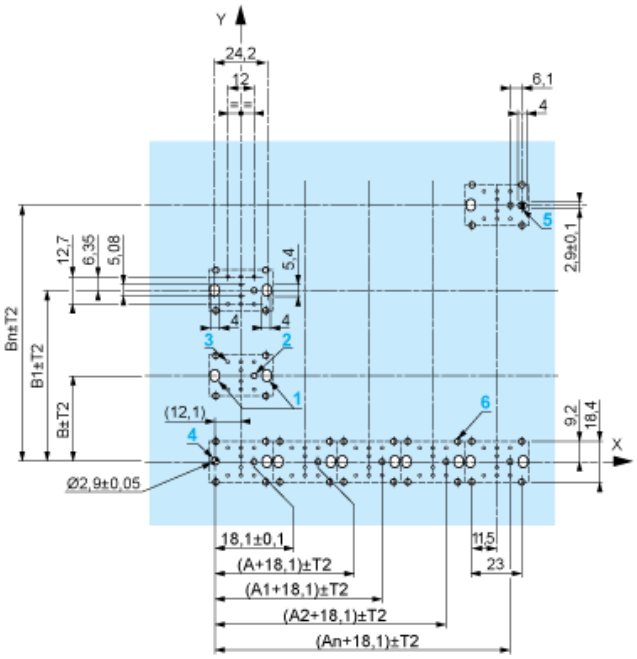
Panel Cut-outs (Viewed from Installer's Side)



A: 30 mm min. / 1.18 in. min.
B: 40 mm min. / 1.57 in. min.

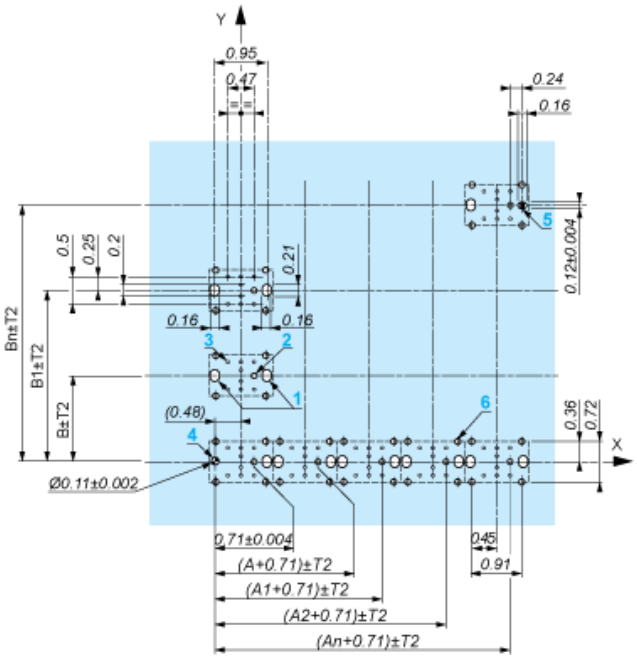
Printed Circuit Board Cut-outs (Viewed from Electrical Block Side)

Dimensions in mm



A: 30 mm min.
B: 40 mm min.

Dimensions in in.



A: 1.18 in. min.
B: 1.57 in. min.

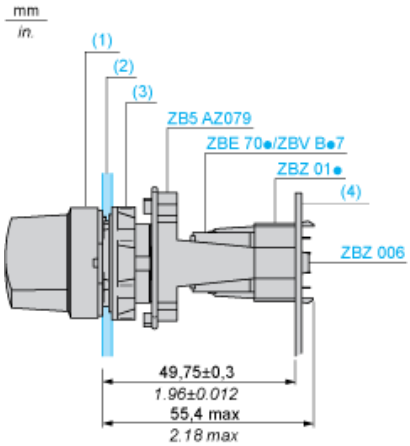
General Tolerances of the Panel and Printed Circuit Board

The cumulative tolerance must not exceed 0.3 mm / 0.012 in.: T1 + T2 = 0.3 mm max.

Installation Precautions

- Minimum thickness of circuit board: 1.6 mm / 0.06 in.
- Cut-out diameter: 22.4 mm ± 0.1 / 0.88 in. ± 0.004
- Orientation of body/fixing collar ZB5AZ009: ± 2°30' (excluding cut-outs marked a and b).
- Tightening torque of screws ZBZ006: 0.6 N.m (5.3 lbf.in) max.
- Allow for one ZB5AZ079 fixing collar/pillar and its fixing screws:
  - every 90 mm / 3.54 in. horizontally (X), and 120 mm / 4.72 in. vertically (Y).
  - with each selector switch head (ZB5AD•, ZB5AJ•, ZB5AG•).

The fixing centers marked a and b are diagonally opposed and must align with those marked 4 and 5.



(1) Head ZB5AD•
(2) Panel
(2) Nut
(4) Printed circuit board

APPENDIX D.1 SOLID WASTE LABORATORY REPORTS

Sample Summary

Parsons Engineering Science

Job No: JC90936

Pine Avenue, Niagara Falls, NY
Project No: 448433.03000

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC90936-1	06/28/19	10:15	AC	06/29/19	AQ	Water	IDW-WATER_06/28/19
JC90936-2	06/28/19	10:30	AC	06/29/19	AQ	Water	IDW-WATER_06/28/19
JC90936-3	06/28/19	11:30	AC	06/29/19	SO	Soil	IDW_SOLID_062819
JC90936-4	06/28/19	11:45	AC	06/29/19	SO	Soil	IDW_SOLID_062819
JC90936-5	06/28/19	11:45	AC	06/29/19	AQ	Trip Blank Water	TRIP BLANK

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-1
Matrix: AQ - Water
Method: SW846 8260C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	2D184002.D	250	07/10/19 04:28	ED	n/a	n/a	V2D7886
Run #2	2D184003.D	2500	07/10/19 04:57	ED	n/a	n/a	V2D7886

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	2500	1500	ug/l	
71-43-2	Benzene	ND	130	110	ug/l	
74-97-5	Bromochloromethane	ND	250	120	ug/l	
75-27-4	Bromodichloromethane [b]	ND	250	150	ug/l	
75-25-2	Bromoform	ND	250	160	ug/l	
74-83-9	Bromomethane	ND	500	410	ug/l	
78-93-3	2-Butanone (MEK)	ND	2500	1700	ug/l	
75-15-0	Carbon disulfide	ND	500	240	ug/l	
56-23-5	Carbon tetrachloride	ND	250	140	ug/l	
108-90-7	Chlorobenzene	ND	250	140	ug/l	
75-00-3	Chloroethane	ND	250	180	ug/l	
67-66-3	Chloroform	ND	250	130	ug/l	
74-87-3	Chloromethane	ND	250	190	ug/l	
110-82-7	Cyclohexane	ND	1300	200	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	500	300	ug/l	
124-48-1	Dibromochloromethane	ND	250	140	ug/l	
106-93-4	1,2-Dibromoethane	ND	250	120	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	250	130	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	250	140	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	250	130	ug/l	
75-71-8	Dichlorodifluoromethane	ND	500	340	ug/l	
75-34-3	1,1-Dichloroethane	ND	250	140	ug/l	
107-06-2	1,2-Dichloroethane	ND	250	150	ug/l	
75-35-4	1,1-Dichloroethene	ND	250	150	ug/l	
156-59-2	cis-1,2-Dichloroethene	3020	250	130	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	250	130	ug/l	
78-87-5	1,2-Dichloropropane	ND	250	130	ug/l	
10061-01-5	cis-1,3-Dichloropropene [c]	ND	250	120	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	250	110	ug/l	
100-41-4	Ethylbenzene	ND	250	150	ug/l	
76-13-1	Freon 113	ND	1300	490	ug/l	
591-78-6	2-Hexanone	ND	1300	510	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-1	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	ND	250	160	ug/l	
79-20-9	Methyl Acetate	ND	1300	200	ug/l	
108-87-2	Methylcyclohexane	ND	1300	150	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	250	130	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK [b]	ND	1300	460	ug/l	
75-09-2	Methylene chloride	ND	500	250	ug/l	
100-42-5	Styrene	ND	250	170	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	160	ug/l	
127-18-4	Tetrachloroethene	187000 [d]	2500	2200	ug/l	
108-88-3	Toluene	ND	250	130	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	250	130	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	250	130	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	250	130	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	250	130	ug/l	
79-01-6	Trichloroethene	9430	250	130	ug/l	
75-69-4	Trichlorofluoromethane	ND	500	210	ug/l	
75-01-4	Vinyl chloride	ND	250	200	ug/l	
	m,p-Xylene	ND	250	200	ug/l	
95-47-6	o-Xylene	ND	250	150	ug/l	
1330-20-7	Xylene (total)	ND	250	150	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	95%	97%	80-120%
17060-07-0	1,2-Dichloroethane-D4	101%	102%	81-124%
2037-26-5	Toluene-D8	106%	103%	80-120%
460-00-4	4-Bromofluorobenzene	105%	107%	80-120%

(a) Diluted due to high concentration of target compound.
(b) Associated CCV outside of control limits high, sample was ND.
(c) Associated CCV and BS outside of control limits high, sample was ND.
(d) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-1
Matrix: AQ - Water
Method: SW846 8270D SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M155927.D	1	07/06/19 06:43	CS	07/05/19 09:30	OP21373	EM6658
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

ABN TCL List (SOM0 2.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	4.9	0.80	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	4.9	0.87	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.0	1.2	ug/l	
105-67-9	2,4-Dimethylphenol	ND	4.9	2.4	ug/l	
51-28-5	2,4-Dinitrophenol	ND	4.9	1.5	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	4.9	1.3	ug/l	
95-48-7	2-Methylphenol	ND	2.0	0.87	ug/l	
	3&4-Methylphenol	ND	2.0	0.86	ug/l	
88-75-5	2-Nitrophenol	ND	4.9	0.94	ug/l	
100-02-7	4-Nitrophenol	ND	9.8	1.1	ug/l	
87-86-5	Pentachlorophenol	ND	3.9	1.4	ug/l	
108-95-2	Phenol	0.52	2.0	0.38	ug/l	J
58-90-2	2,3,4,6-Tetrachlorophenol	ND	4.9	1.4	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	4.9	1.3	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	4.9	0.91	ug/l	
83-32-9	Acenaphthene	ND	0.98	0.19	ug/l	
208-96-8	Acenaphthylene	0.15	0.98	0.13	ug/l	J
98-86-2	Acetophenone	ND	2.0	0.20	ug/l	
120-12-7	Anthracene	0.41	0.98	0.21	ug/l	J
1912-24-9	Atrazine	1.4	2.0	0.44	ug/l	J
100-52-7	Benzaldehyde [a]	ND	4.9	0.28	ug/l	
56-55-3	Benzo(a)anthracene	0.49	0.98	0.20	ug/l	J
50-32-8	Benzo(a)pyrene	0.31	0.98	0.21	ug/l	J
205-99-2	Benzo(b)fluoranthene	0.35	0.98	0.20	ug/l	J
191-24-2	Benzo(g,h,i)perylene	ND	0.98	0.33	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.98	0.20	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.0	0.40	ug/l	
85-68-7	Butyl benzyl phthalate	8.8	2.0	0.45	ug/l	
92-52-4	1,1'-Biphenyl	0.23	0.98	0.21	ug/l	J
91-58-7	2-Chloronaphthalene	ND	2.0	0.23	ug/l	
106-47-8	4-Chloroaniline	ND	4.9	0.33	ug/l	
86-74-8	Carbazole	1.1	0.98	0.22	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-1
Matrix: AQ - Water
Method: SW846 8270D SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

ABN TCL List (SOM0 2.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	2.0	0.64	ug/l	
218-01-9	Chrysene	0.39	0.98	0.17	ug/l	J
111-91-1	bis(2-Chloroethoxy)methane	ND	2.0	0.27	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.0	0.24	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	ND	2.0	0.40	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.0	0.36	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.98	0.54	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.98	0.47	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.0	0.50	ug/l	
123-91-1	1,4-Dioxane	ND	0.98	0.64	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.98	0.32	ug/l	
132-64-9	Dibenzofuran	0.38	4.9	0.22	ug/l	J
84-74-2	Di-n-butyl phthalate	6.4	2.0	0.49	ug/l	
117-84-0	Di-n-octyl phthalate	ND	2.0	0.23	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.26	ug/l	
131-11-3	Dimethyl phthalate	ND	2.0	0.21	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	5.6	2.0	1.6	ug/l	
206-44-0	Fluoranthene	1.4	0.98	0.17	ug/l	
86-73-7	Fluorene	0.68	0.98	0.17	ug/l	J
118-74-1	Hexachlorobenzene	ND	0.98	0.32	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.98	0.48	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	9.8	2.7	ug/l	
67-72-1	Hexachloroethane	ND	2.0	0.38	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.98	0.33	ug/l	
78-59-1	Isophorone	ND	2.0	0.27	ug/l	
91-57-6	2-Methylnaphthalene	0.63	0.98	0.21	ug/l	J
88-74-4	2-Nitroaniline	ND	4.9	0.27	ug/l	
99-09-2	3-Nitroaniline	ND	4.9	0.38	ug/l	
100-01-6	4-Nitroaniline	ND	4.9	0.43	ug/l	
91-20-3	Naphthalene	3.4	0.98	0.23	ug/l	
98-95-3	Nitrobenzene	ND	2.0	0.63	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.0	0.47	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	4.9	0.22	ug/l	
85-01-8	Phenanthrene	2.3	0.98	0.17	ug/l	
129-00-0	Pyrene	1.0	0.98	0.21	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.0	0.36	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	36%		10-110%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-1	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

ABN TCL List (SOM0 2.0)

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	23%		10-110%
118-79-6	2,4,6-Tribromophenol	75%		36-151%
4165-60-0	Nitrobenzene-d5	71%		34-128%
321-60-8	2-Fluorobiphenyl	72%		38-119%
1718-51-0	Terphenyl-d14	60%		26-129%

(a) Associated CCV outside of control limits low. Low level standard analyzed to demonstrate system suitability to detect affected analytes.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-1	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8151A SW846 3510C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G123621.D	1	07/07/19 10:37	CB	07/04/19 08:00	OP21339	G3G4342
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	2.5 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D [a]	ND	0.42	0.11	ug/l	
93-72-1	2,4,5-TP (Silvex) [a]	ND	0.083	0.035	ug/l	
93-76-5	2,4,5-T	ND	0.083	0.029	ug/l	
75-99-0	Dalapon	ND	0.083	0.023	ug/l	
1918-00-9	Dicamba	ND	0.083	0.016	ug/l	
120-36-5	Dichloroprop	ND	0.42	0.20	ug/l	
88-85-7	Dinoseb [a]	ND	0.42	0.077	ug/l	
94-74-6	MCPA [b]	ND	42	10	ug/l	
93-65-2	MCPP [c]	ND	42	7.5	ug/l	
87-86-5	Pentachlorophenol [a]	ND	0.042	0.017	ug/l	
94-82-6	2,4-DB [a]	ND	0.42	0.14	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	102%		10-179%
19719-28-9	2,4-DCAA	90%		10-179%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits low. This compound outside control limits biased high in the associated BS.
(c) Associated CCV outside of control limits low.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-1
Matrix: AQ - Water
Method: SW846 8081B SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	6G66222.D	1	07/16/19 13:08	VDT	07/15/19 08:00	OP21503	G6G2066
Run #2 [b]	8G24460.D	1	07/04/19 03:41	CP	07/02/19 13:30	OP21316	G8G835

	Initial Volume	Final Volume
Run #1	300 ml	2.0 ml
Run #2	300 ml	2.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.0067	0.0034	ug/l	
319-84-6	alpha-BHC	ND	0.0067	0.0035	ug/l	
319-85-7	beta-BHC	ND	0.0067	0.0053	ug/l	
319-86-8	delta-BHC	ND	0.0067	0.0044	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.0067	0.0040	ug/l	
5103-71-9	alpha-Chlordane	ND	0.0067	0.0033	ug/l	
5103-74-2	gamma-Chlordane	ND	0.0067	0.0028	ug/l	
60-57-1	Dieldrin	ND	0.0067	0.0051	ug/l	
72-54-8	4,4'-DDD [c]	0.0081	0.0067	0.0038	ug/l	
72-55-9	4,4'-DDE	ND	0.0067	0.0034	ug/l	
50-29-3	4,4'-DDT	ND	0.0067	0.0046	ug/l	
72-20-8	Endrin	ND	0.0067	0.0040	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.0067	0.0036	ug/l	
7421-93-4	Endrin aldehyde	ND	0.0067	0.0045	ug/l	
53494-70-5	Endrin ketone	ND	0.0067	0.0041	ug/l	
959-98-8	Endosulfan-I	ND	0.0067	0.0035	ug/l	
33213-65-9	Endosulfan-II	ND	0.0067	0.0033	ug/l	
76-44-8	Heptachlor	ND	0.0067	0.0030	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.0067	0.0040	ug/l	
72-43-5	Methoxychlor	ND	0.013	0.0045	ug/l	
8001-35-2	Toxaphene	ND	0.17	0.11	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	79%	26%	13-153%
877-09-8	Tetrachloro-m-xylene	60%	27%	13-153%
2051-24-3	Decachlorobiphenyl	82%	10%	10-138%
2051-24-3	Decachlorobiphenyl	55%	9% [d]	10-138%

(a) Re-extracted due to MB outside in house QC limits. Originally prep date was within holding time.
(b) Confirmation run.
(c) More than 40 % RPD for detected concentrations between the two GC columns.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-1	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8081B SW846 3510C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q

(d) Outside control limits due to matrix interference.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-1	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8082A SW846 3510C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5G89537.D	1	07/03/19 10:19	CP	07/02/19 13:30	OP21315	G5G2165
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	2.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016 [a]	ND	0.33	0.13	ug/l	
11104-28-2	Aroclor 1221	ND	0.33	0.28	ug/l	
11141-16-5	Aroclor 1232	ND	0.33	0.17	ug/l	
53469-21-9	Aroclor 1242	ND	0.33	0.15	ug/l	
12672-29-6	Aroclor 1248	ND	0.33	0.084	ug/l	
11097-69-1	Aroclor 1254	ND	0.33	0.28	ug/l	
11096-82-5	Aroclor 1260 [a]	ND	0.33	0.10	ug/l	
11100-14-4	Aroclor 1268	ND	0.33	0.12	ug/l	
37324-23-5	Aroclor 1262	ND	0.33	0.13	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	42%		11-166%
877-09-8	Tetrachloro-m-xylene	41%		11-166%
2051-24-3	Decachlorobiphenyl	22%		10-150%
2051-24-3	Decachlorobiphenyl	17%		10-150%

(a) This compound outside control limits biased high in the associated BS.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-1
Matrix: AQ - Water
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	11.4	0.20	0.046	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Antimony	ND	0.0060	0.0047	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Arsenic [a]	0.0092	0.0060	0.0056	mg/l	2	07/05/19	07/11/19	ND	SW846 6010D [3]	SW846 3010A [5]
Barium	0.0771 J	0.20	0.013	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Beryllium	ND	0.0010	0.00050	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Cadmium	ND	0.0030	0.0010	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Calcium	106	5.0	0.099	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Chromium	0.0141	0.010	0.0020	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Cobalt	0.0096 J	0.050	0.0026	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Copper	0.0154	0.010	0.0059	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Iron	13.4	0.10	0.032	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Lead [a]	0.0240	0.0060	0.0036	mg/l	2	07/05/19	07/11/19	ND	SW846 6010D [3]	SW846 3010A [5]
Magnesium	51.6	5.0	0.14	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Manganese	0.308	0.015	0.0014	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Mercury	0.00020	0.00020	0.000095	mg/l	1	07/01/19	07/01/19	LL	SW846 7470A [1]	SW846 7470A [4]
Nickel	0.0251	0.010	0.0017	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Potassium	9.10 J	10	0.20	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Selenium	ND	0.010	0.0049	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Silver	ND	0.010	0.0019	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Sodium	28.6	10	0.57	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Thallium	ND	0.010	0.0018	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Vanadium	0.0231 J	0.050	0.0018	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Zinc	0.0440	0.020	0.0069	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]

(1) Instrument QC Batch: MA47014
(2) Instrument QC Batch: MA47077
(3) Instrument QC Batch: MA47083
(4) Prep QC Batch: MP16185
(5) Prep QC Batch: MP16258

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-1	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
		Percent Solids:	n/a
Project:	Pine Avenue, Niagara Falls, NY		

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Corrosivity as pH	6.93 NC			su	1	07/10/19 21:54	MS	SW846 9040C
Cyanide	ND	0.010	0.0041	mg/l	1	07/11/19 10:00	KI	EPA 335.4/LACHAT
Cyanide Reactivity	ND	10	10	mg/l	1	07/03/19 15:31	BM	SW846 CHAP7/9012B
Ignitability (Flashpoint)	> 200			Deg. F	1	07/14/19 14:30	JOO	SW846 1010A/ASTM D93
Sulfide Reactivity	ND	100	43	mg/l	1	07/03/19 15:49	MP	SW846 CHAP7/9034

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-2
Matrix: AQ - Water
Method: SW846 8260C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	2D184004.D	50	07/10/19 05:27	ED	n/a	n/a	V2D7886
Run #2	2D184005.D	500	07/10/19 05:57	ED	n/a	n/a	V2D7886

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	500	300	ug/l	
71-43-2	Benzene	ND	25	21	ug/l	
74-97-5	Bromochloromethane	ND	50	24	ug/l	
75-27-4	Bromodichloromethane [b]	ND	50	29	ug/l	
75-25-2	Bromoform	ND	50	32	ug/l	
74-83-9	Bromomethane	ND	100	82	ug/l	
78-93-3	2-Butanone (MEK)	ND	500	340	ug/l	
75-15-0	Carbon disulfide	ND	100	48	ug/l	
56-23-5	Carbon tetrachloride	ND	50	28	ug/l	
108-90-7	Chlorobenzene	ND	50	28	ug/l	
75-00-3	Chloroethane	ND	50	36	ug/l	
67-66-3	Chloroform	ND	50	25	ug/l	
74-87-3	Chloromethane	ND	50	38	ug/l	
110-82-7	Cyclohexane	ND	250	39	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	100	60	ug/l	
124-48-1	Dibromochloromethane	ND	50	28	ug/l	
106-93-4	1,2-Dibromoethane	ND	50	24	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	50	27	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	50	27	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	25	ug/l	
75-71-8	Dichlorodifluoromethane	ND	100	68	ug/l	
75-34-3	1,1-Dichloroethane	ND	50	28	ug/l	
107-06-2	1,2-Dichloroethane	ND	50	30	ug/l	
75-35-4	1,1-Dichloroethene	ND	50	30	ug/l	
156-59-2	cis-1,2-Dichloroethene	1600	50	25	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	50	27	ug/l	
78-87-5	1,2-Dichloropropane	ND	50	25	ug/l	
10061-01-5	cis-1,3-Dichloropropene [c]	ND	50	24	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	50	22	ug/l	
100-41-4	Ethylbenzene	ND	50	30	ug/l	
76-13-1	Freon 113	ND	250	97	ug/l	
591-78-6	2-Hexanone	ND	250	100	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-2	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	ND	50	32	ug/l	
79-20-9	Methyl Acetate	ND	250	40	ug/l	
108-87-2	Methylcyclohexane	ND	250	30	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	50	25	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK [b]	ND	250	93	ug/l	
75-09-2	Methylene chloride	ND	100	50	ug/l	
100-42-5	Styrene	ND	50	35	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	33	ug/l	
127-18-4	Tetrachloroethene	27300 [d]	500	450	ug/l	
108-88-3	Toluene	ND	50	27	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	50	25	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	50	25	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	50	27	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	50	27	ug/l	
79-01-6	Trichloroethene	3720	50	26	ug/l	
75-69-4	Trichlorofluoromethane	ND	100	42	ug/l	
75-01-4	Vinyl chloride	ND	50	39	ug/l	
	m,p-Xylene	ND	50	39	ug/l	
95-47-6	o-Xylene	ND	50	30	ug/l	
1330-20-7	Xylene (total)	ND	50	30	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	96%	97%	80-120%
17060-07-0	1,2-Dichloroethane-D4	103%	103%	81-124%
2037-26-5	Toluene-D8	104%	102%	80-120%
460-00-4	4-Bromofluorobenzene	106%	107%	80-120%

(a) Diluted due to high concentration of target compound.
(b) Associated CCV outside of control limits high, sample was ND.
(c) Associated CCV and BS outside of control limits high, sample was ND.
(d) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-2
Matrix: AQ - Water
Method: SW846 8270D SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M155928.D	1	07/06/19 07:12	CS	07/05/19 09:30	OP21373	EM6658
Run #2							

	Initial Volume	Final Volume
Run #1	1040 ml	1.0 ml
Run #2		

ABN TCL List (SOM0 2.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	4.8	0.79	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	4.8	0.86	ug/l	
120-83-2	2,4-Dichlorophenol	ND	1.9	1.2	ug/l	
105-67-9	2,4-Dimethylphenol	ND	4.8	2.3	ug/l	
51-28-5	2,4-Dinitrophenol	ND	4.8	1.5	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	4.8	1.2	ug/l	
95-48-7	2-Methylphenol	ND	1.9	0.85	ug/l	
	3&4-Methylphenol	ND	1.9	0.85	ug/l	
88-75-5	2-Nitrophenol	ND	4.8	0.92	ug/l	
100-02-7	4-Nitrophenol	ND	9.6	1.1	ug/l	
87-86-5	Pentachlorophenol	ND	3.8	1.3	ug/l	
108-95-2	Phenol	0.53	1.9	0.38	ug/l	J
58-90-2	2,3,4,6-Tetrachlorophenol	ND	4.8	1.4	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	4.8	1.3	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	4.8	0.89	ug/l	
83-32-9	Acenaphthene	ND	0.96	0.18	ug/l	
208-96-8	Acenaphthylene	ND	0.96	0.13	ug/l	
98-86-2	Acetophenone	ND	1.9	0.20	ug/l	
120-12-7	Anthracene	ND	0.96	0.20	ug/l	
1912-24-9	Atrazine	2.4	1.9	0.43	ug/l	
100-52-7	Benzaldehyde [a]	ND	4.8	0.28	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.96	0.20	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.96	0.20	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.96	0.20	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.96	0.33	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.96	0.20	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	1.9	0.39	ug/l	
85-68-7	Butyl benzyl phthalate	10.5	1.9	0.44	ug/l	
92-52-4	1,1'-Biphenyl	ND	0.96	0.20	ug/l	
91-58-7	2-Chloronaphthalene	ND	1.9	0.23	ug/l	
106-47-8	4-Chloroaniline	ND	4.8	0.33	ug/l	
86-74-8	Carbazole	0.46	0.96	0.22	ug/l	J

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-2
Matrix: AQ - Water
Method: SW846 8270D SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

ABN TCL List (SOM0 2.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	1.9	0.62	ug/l	
218-01-9	Chrysene	ND	0.96	0.17	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	1.9	0.27	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	1.9	0.24	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	ND	1.9	0.39	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	1.9	0.35	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.96	0.53	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.96	0.46	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	1.9	0.49	ug/l	
123-91-1	1,4-Dioxane	ND	0.96	0.63	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.96	0.32	ug/l	
132-64-9	Dibenzofuran	0.21	4.8	0.21	ug/l	J
84-74-2	Di-n-butyl phthalate	6.5	1.9	0.48	ug/l	
117-84-0	Di-n-octyl phthalate	ND	1.9	0.22	ug/l	
84-66-2	Diethyl phthalate	ND	1.9	0.25	ug/l	
131-11-3	Dimethyl phthalate	ND	1.9	0.21	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	1.9	1.6	ug/l	
206-44-0	Fluoranthene	0.19	0.96	0.16	ug/l	J
86-73-7	Fluorene	0.45	0.96	0.16	ug/l	J
118-74-1	Hexachlorobenzene	ND	0.96	0.31	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.96	0.47	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	9.6	2.7	ug/l	
67-72-1	Hexachloroethane	ND	1.9	0.37	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.96	0.32	ug/l	
78-59-1	Isophorone	ND	1.9	0.27	ug/l	
91-57-6	2-Methylnaphthalene	0.23	0.96	0.20	ug/l	J
88-74-4	2-Nitroaniline	ND	4.8	0.27	ug/l	
99-09-2	3-Nitroaniline	ND	4.8	0.37	ug/l	
100-01-6	4-Nitroaniline	ND	4.8	0.42	ug/l	
91-20-3	Naphthalene	0.91	0.96	0.22	ug/l	J
98-95-3	Nitrobenzene	ND	1.9	0.62	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	1.9	0.46	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	4.8	0.21	ug/l	
85-01-8	Phenanthrene	1.4	0.96	0.17	ug/l	
129-00-0	Pyrene	ND	0.96	0.21	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	1.9	0.36	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	32%		10-110%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-2	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

ABN TCL List (SOM0 2.0)

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	23%		10-110%
118-79-6	2,4,6-Tribromophenol	87%		36-151%
4165-60-0	Nitrobenzene-d5	70%		34-128%
321-60-8	2-Fluorobiphenyl	66%		38-119%
1718-51-0	Terphenyl-d14	47%		26-129%

(a) Associated CCV outside of control limits low. Low level standard analyzed to demonstrate system suitability to detect affected analytes.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-2	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8151A SW846 3510C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G123622.D	1	07/07/19 11:06	CB	07/04/19 08:00	OP21339	G3G4342
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	2.5 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D [a]	ND	0.42	0.11	ug/l	
93-72-1	2,4,5-TP (Silvex) [a]	ND	0.083	0.035	ug/l	
93-76-5	2,4,5-T	ND	0.083	0.029	ug/l	
75-99-0	Dalapon	ND	0.083	0.023	ug/l	
1918-00-9	Dicamba	ND	0.083	0.016	ug/l	
120-36-5	Dichloroprop	ND	0.42	0.20	ug/l	
88-85-7	Dinoseb [a]	ND	0.42	0.077	ug/l	
94-74-6	MCPA [b]	ND	42	10	ug/l	
93-65-2	MCPP [c]	ND	42	7.5	ug/l	
87-86-5	Pentachlorophenol [d]	0.068	0.042	0.017	ug/l	
94-82-6	2,4-DB [a]	ND	0.42	0.14	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	90%		10-179%
19719-28-9	2,4-DCAA	88%		10-179%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits low. This compound outside control limits biased high in the associated BS.
(c) Associated CCV outside of control limits low.
(d) Reported from the 2nd signal. The %D of the CCV on the 1st signal exceeds the method criteria of 20%, so it being used for confirmation only.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-2
Matrix: AQ - Water
Method: SW846 8081B SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	6G66223.D	1	07/16/19 13:25	VDT	07/15/19 08:00	OP21503	G6G2066
Run #2 [b]	8G24461.D	1	07/04/19 03:58	CP	07/02/19 13:30	OP21316	G8G835

	Initial Volume	Final Volume
Run #1	300 ml	2.0 ml
Run #2	300 ml	2.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.0067	0.0034	ug/l	
319-84-6	alpha-BHC	ND	0.0067	0.0035	ug/l	
319-85-7	beta-BHC	ND	0.0067	0.0053	ug/l	
319-86-8	delta-BHC	ND	0.0067	0.0044	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.0067	0.0040	ug/l	
5103-71-9	alpha-Chlordane	ND	0.0067	0.0033	ug/l	
5103-74-2	gamma-Chlordane	ND	0.0067	0.0028	ug/l	
60-57-1	Dieldrin	0.0057	0.0067	0.0051	ug/l	J
72-54-8	4,4'-DDD [c]	0.0054	0.0067	0.0038	ug/l	J
72-55-9	4,4'-DDE	ND	0.0067	0.0034	ug/l	
50-29-3	4,4'-DDT	ND	0.0067	0.0046	ug/l	
72-20-8	Endrin	ND	0.0067	0.0040	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.0067	0.0036	ug/l	
7421-93-4	Endrin aldehyde	ND	0.0067	0.0045	ug/l	
53494-70-5	Endrin ketone	ND	0.0067	0.0041	ug/l	
959-98-8	Endosulfan-I	ND	0.0067	0.0035	ug/l	
33213-65-9	Endosulfan-II	ND	0.0067	0.0033	ug/l	
76-44-8	Heptachlor	ND	0.0067	0.0030	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.0067	0.0040	ug/l	
72-43-5	Methoxychlor	ND	0.013	0.0045	ug/l	
8001-35-2	Toxaphene	ND	0.17	0.11	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%	62%	13-153%
877-09-8	Tetrachloro-m-xylene	60%	50%	13-153%
2051-24-3	Decachlorobiphenyl	78%	19%	10-138%
2051-24-3	Decachlorobiphenyl	53%	14%	10-138%

(a) Re-extracted due to MB outside in house QC limits. Originally prep date was within holding time.
(b) Confirmation run.
(c) More than 40 % RPD for detected concentrations between the two GC columns.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-2	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8082A SW846 3510C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5G89538.D	1	07/03/19 10:53	CP	07/02/19 13:30	OP21315	G5G2165
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	2.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016 [a]	ND	0.33	0.13	ug/l	
11104-28-2	Aroclor 1221	ND	0.33	0.28	ug/l	
11141-16-5	Aroclor 1232	ND	0.33	0.17	ug/l	
53469-21-9	Aroclor 1242	ND	0.33	0.15	ug/l	
12672-29-6	Aroclor 1248	ND	0.33	0.084	ug/l	
11097-69-1	Aroclor 1254	ND	0.33	0.28	ug/l	
11096-82-5	Aroclor 1260 [a]	ND	0.33	0.10	ug/l	
11100-14-4	Aroclor 1268	ND	0.33	0.12	ug/l	
37324-23-5	Aroclor 1262	ND	0.33	0.13	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	63%		11-166%
877-09-8	Tetrachloro-m-xylene	68%		11-166%
2051-24-3	Decachlorobiphenyl	28%		10-150%
2051-24-3	Decachlorobiphenyl	22%		10-150%

(a) This compound outside control limits biased high in the associated BS.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-2
Matrix: AQ - Water
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	41.1	0.20	0.046	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Antimony	ND	0.0060	0.0047	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Arsenic [a]	0.0218	0.0090	0.0084	mg/l	3	07/05/19	07/11/19	ND	SW846 6010D [3]	SW846 3010A [5]
Barium	0.242	0.20	0.013	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Beryllium	0.0016	0.0010	0.00050	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Cadmium	ND	0.0030	0.0010	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Calcium	182	5.0	0.099	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Chromium	0.0556	0.010	0.0020	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Cobalt	0.0536	0.050	0.0026	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Copper	0.0591	0.010	0.0059	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Iron	58.9	0.10	0.032	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Lead [a]	0.0249	0.0090	0.0054	mg/l	3	07/05/19	07/11/19	ND	SW846 6010D [3]	SW846 3010A [5]
Magnesium	65.3	5.0	0.14	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Manganese	1.33	0.015	0.0014	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Mercury	0.00017 J	0.00020	0.000095	mg/l	1	07/01/19	07/01/19	LL	SW846 7470A [1]	SW846 7470A [4]
Nickel	0.0779	0.010	0.0017	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Potassium	16.4	10	0.20	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Selenium	ND	0.010	0.0049	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Silver	0.0021 J	0.010	0.0019	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Sodium	40.8	10	0.57	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Thallium	0.0022 J	0.010	0.0018	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Vanadium	0.0794	0.050	0.0018	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Zinc	0.215	0.020	0.0069	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]

(1) Instrument QC Batch: MA47014
(2) Instrument QC Batch: MA47077
(3) Instrument QC Batch: MA47083
(4) Prep QC Batch: MP16185
(5) Prep QC Batch: MP16258

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-2	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
		Percent Solids:	n/a
Project:	Pine Avenue, Niagara Falls, NY		

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Corrosivity as pH	7.62 NC			su	1	07/10/19 21:55	MS	SW846 9040C
Cyanide	ND	0.010	0.0041	mg/l	1	07/11/19 10:01	KI	EPA 335.4/LACHAT
Cyanide Reactivity	ND	10	10	mg/l	1	07/03/19 15:32	BM	SW846 CHAP7/9012B
Ignitability (Flashpoint)	> 200			Deg. F	1	07/14/19 14:30	JOO	SW846 1010A/ASTM D93
Sulfide Reactivity	ND	100	43	mg/l	1	07/03/19 15:49	MP	SW846 CHAP7/9034

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID: IDW_SOLID_062819
Lab Sample ID: JC90936-3
Matrix: SO - Soil
Method: SW846 8260C SW846 1311
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: 83.6

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2V59500.D	5	07/02/19 16:46	EH	06/29/19 19:45	GP22087	V2V2442
Run #2 [a]	2V59524.D	50	07/03/19 13:12	EH	06/29/19 19:45	GP22087	V2V2443

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
71-43-2	Benzene	ND	D018	0.50	0.0025	0.0021	mg/l	
78-93-3	2-Butanone (MEK)	ND	D035	200	0.10	0.034	mg/l	
56-23-5	Carbon tetrachloride	ND	D019	0.50	0.0050	0.0028	mg/l	
108-90-7	Chlorobenzene	ND	D021	100	0.0050	0.0028	mg/l	
67-66-3	Chloroform	ND	D022	6.0	0.0050	0.0025	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.0050	0.0025	mg/l	
107-06-2	1,2-Dichloroethane	ND	D028	0.50	0.0050	0.0030	mg/l	
75-35-4	1,1-Dichloroethene	ND	D029	0.70	0.0050	0.0030	mg/l	
127-18-4	Tetrachloroethene	1.68 [b]	D039	0.70	0.050	0.045	mg/l	
79-01-6	Trichloroethene	0.0460	D040	0.50	0.0050	0.0026	mg/l	
75-01-4	Vinyl chloride	ND	D043	0.20	0.0050	0.0039	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	92%	91%	76-120%
17060-07-0	1,2-Dichloroethane-D4	91%	93%	64-135%
2037-26-5	Toluene-D8	92%	92%	76-117%
460-00-4	4-Bromofluorobenzene	99%	98%	72-122%

(a) Diluted due to high concentration of target compound.
(b) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW_SOLID_062819
Lab Sample ID: JC90936-3
Matrix: SO - Soil
Method: SW846 8270D SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: 83.6

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F186009.D	1	07/18/19 04:06	CS	07/17/19 09:00	OP21540	EF8001
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	1.0 ml
Run #2		

ABN TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	D023	200	0.020	0.0089	mg/l	
	3&4-Methylphenol	ND	D024	200	0.020	0.0088	mg/l	
87-86-5	Pentachlorophenol	ND	D037	100	0.10	0.014	mg/l	
95-95-4	2,4,5-Trichlorophenol	ND	D041	400	0.050	0.013	mg/l	
88-06-2	2,4,6-Trichlorophenol	ND	D042	2.0	0.050	0.0092	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.020	0.0017	mg/l	
121-14-2	2,4-Dinitrotoluene	ND	D030	0.13	0.020	0.0055	mg/l	
118-74-1	Hexachlorobenzene	ND	D032	0.13	0.020	0.0033	mg/l	
87-68-3	Hexachlorobutadiene	ND	D033	0.50	0.010	0.0049	mg/l	
67-72-1	Hexachloroethane	ND	D034	3.0	0.050	0.0039	mg/l	
98-95-3	Nitrobenzene	ND	D036	2.0	0.020	0.0064	mg/l	
110-86-1	Pyridine	ND	D038	5.0	0.020	0.0039	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	45%		14-88%
4165-62-2	Phenol-d5	31%		10-110%
118-79-6	2,4,6-Tribromophenol	90%		39-149%
4165-60-0	Nitrobenzene-d5	88%		32-128%
321-60-8	2-Fluorobiphenyl	73%		35-119%
1718-51-0	Terphenyl-d14	86%		10-126%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW_SOLID_062819		
Lab Sample ID:	JC90936-3	**Date Sampled:**	06/28/19
Matrix:	SO - Soil	**Date Received:**	06/29/19
Method:	SW846 8151A SW846 3510C	**Percent Solids:**	83.6
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G123745.D	1	07/19/19 09:52	VDT	07/17/19 07:00	OP21562	G3G4352
Run #2							

	Initial Volume	Final Volume
Run #1	30.0 ml	2.5 ml
Run #2		

Herbicide TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
94-75-7	2,4-D [a]	ND	D016	10	0.0042	0.0012	mg/l	
93-72-1	2,4,5-TP (Silvex) [a]	ND	D017	1.0	0.0012	0.00025	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	83%		13-169%
19719-28-9	2,4-DCAA	68%		13-169%

(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW_SOLID_062819
Lab Sample ID: JC90936-3
Matrix: SO - Soil
Method: SW846 8081B SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: 83.6

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	8G24742.D	1	07/18/19 13:54	RK	07/17/19 10:00	OP21566	G8G846
Run #2							

	Initial Volume	Final Volume
Run #1	30.0 ml	2.0 ml
Run #2		

Pesticide TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND	D013	0.40	0.000067	0.000040	mg/l	
12789-03-6	Chlordane	ND	D020	0.030	0.0033	0.0014	mg/l	
72-20-8	Endrin	ND	D012	0.020	0.000067	0.000040	mg/l	
76-44-8	Heptachlor	ND	D031	0.0080	0.000067	0.000030	mg/l	
1024-57-3	Heptachlor epoxide	ND	D031	0.0080	0.000067	0.000040	mg/l	
72-43-5	Methoxychlor	ND	D014	10	0.00013	0.000045	mg/l	
8001-35-2	Toxaphene	ND	D015	0.50	0.0017	0.0011	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	61%		30-137%
877-09-8	Tetrachloro-m-xylene	61%		30-137%
2051-24-3	Decachlorobiphenyl	80%		10-137%
2051-24-3	Decachlorobiphenyl	77%		10-137%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW_SOLID_062819
Lab Sample ID: JC90936-3
Matrix: SO - Soil
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: 83.6

Metals Analysis, TCLP Leachate SW846 1311

Analyte	Result	HW#	MCL	RL	MDL	Units	DF	Prep	Analyzed	By	Method
Arsenic	ND	D004	5.0	0.50	0.014	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Barium	1.0	D005	100	1.0	0.067	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Cadmium	ND	D006	1.0	0.020	0.0050	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Chromium	ND	D007	5.0	0.050	0.010	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Lead	ND	D008	5.0	0.50	0.0090	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Mercury	ND	D009	0.20	0.00020	0.000095	mg/l	1	07/12/19	07/12/19	LL	SW846 7470A [1]
Selenium	ND	D010	1.0	0.50	0.025	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Silver	0.011 J	D011	5.0	0.050	0.0095	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]

(1) Instrument QC Batch: MA47085
(2) Instrument QC Batch: MA47089
(3) Prep QC Batch: MP16354
(4) Prep QC Batch: MP16367

RL = Reporting Limit MDL = Method Detection Limit ND = Not detected
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	IDW_SOLID_062819		
Lab Sample ID:	JC90936-3	**Date Sampled:**	06/28/19
Matrix:	SO - Soil	**Date Received:**	06/29/19
		Percent Solids:	83.6
Project:	Pine Avenue, Niagara Falls, NY		

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Corrosivity as pH	9.08 NC			su	1	07/11/19 13:29	MS	SW846 9045D
Cyanide Reactivity	ND	12	9.2	mg/kg	1	07/12/19 16:21	KI	SW846 CHAP7/9012 B
Ignitability (Flashpoint)	> 200			Deg. F	1	07/14/19 15:30	JOO	SW846 1010A/ASTM D93
Solids, Percent	83.6			%	1	07/10/19 15:30	BG	SM2540 G 18TH ED MOD
Sulfide Reactivity	ND	120	73	mg/kg	1	07/12/19 16:16	CM	SW846 CHAP7/9034

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID: IDW_SOLID_062819
Lab Sample ID: JC90936-4
Matrix: SO - Soil
Method: SW846 8260C SW846 1311
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: 82.1

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2V59534.D	5	07/03/19 17:35	EH	06/29/19 19:45	GP22087	V2V2443
Run #2	2V59535.D	50	07/03/19 18:02	EH	06/29/19 19:45	GP22087	V2V2443

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
71-43-2	Benzene	ND	D018	0.50	0.0025	0.0021	mg/l	
78-93-3	2-Butanone (MEK)	ND	D035	200	0.10	0.034	mg/l	
56-23-5	Carbon tetrachloride	ND	D019	0.50	0.0050	0.0028	mg/l	
108-90-7	Chlorobenzene	ND	D021	100	0.0050	0.0028	mg/l	
67-66-3	Chloroform	ND	D022	6.0	0.0050	0.0025	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.0050	0.0025	mg/l	
107-06-2	1,2-Dichloroethane	ND	D028	0.50	0.0050	0.0030	mg/l	
75-35-4	1,1-Dichloroethene	ND	D029	0.70	0.0050	0.0030	mg/l	
127-18-4	Tetrachloroethene	3.67 [a]	D039	0.70	0.050	0.045	mg/l	
79-01-6	Trichloroethene	0.144	D040	0.50	0.0050	0.0026	mg/l	
75-01-4	Vinyl chloride	ND	D043	0.20	0.0050	0.0039	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	91%	92%	76-120%
17060-07-0	1,2-Dichloroethane-D4	92%	95%	64-135%
2037-26-5	Toluene-D8	89%	92%	76-117%
460-00-4	4-Bromofluorobenzene	97%	96%	72-122%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW_SOLID_062819		
Lab Sample ID:	JC90936-4	**Date Sampled:**	06/28/19
Matrix:	SO - Soil	**Date Received:**	06/29/19
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	82.1
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F186010.D	1	07/18/19 04:33	CS	07/17/19 09:00	OP21540	EF8001
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	1.0 ml
Run #2		

ABN TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	D023	200	0.020	0.0089	mg/l	
	3&4-Methylphenol	ND	D024	200	0.020	0.0088	mg/l	
87-86-5	Pentachlorophenol	ND	D037	100	0.10	0.014	mg/l	
95-95-4	2,4,5-Trichlorophenol	ND	D041	400	0.050	0.013	mg/l	
88-06-2	2,4,6-Trichlorophenol	ND	D042	2.0	0.050	0.0092	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.020	0.0017	mg/l	
121-14-2	2,4-Dinitrotoluene	ND	D030	0.13	0.020	0.0055	mg/l	
118-74-1	Hexachlorobenzene	ND	D032	0.13	0.020	0.0033	mg/l	
87-68-3	Hexachlorobutadiene	ND	D033	0.50	0.010	0.0049	mg/l	
67-72-1	Hexachloroethane	ND	D034	3.0	0.050	0.0039	mg/l	
98-95-3	Nitrobenzene	ND	D036	2.0	0.020	0.0064	mg/l	
110-86-1	Pyridine	ND	D038	5.0	0.020	0.0039	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	42%		14-88%
4165-62-2	Phenol-d5	29%		10-110%
118-79-6	2,4,6-Tribromophenol	83%		39-149%
4165-60-0	Nitrobenzene-d5	85%		32-128%
321-60-8	2-Fluorobiphenyl	66%		35-119%
1718-51-0	Terphenyl-d14	79%		10-126%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW_SOLID_062819		
Lab Sample ID:	JC90936-4	**Date Sampled:**	06/28/19
Matrix:	SO - Soil	**Date Received:**	06/29/19
Method:	SW846 8151A SW846 3510C	**Percent Solids:**	82.1
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G123746.D	1	07/19/19 10:24	VDT	07/17/19 07:00	OP21562	G3G4352
Run #2							

	Initial Volume	Final Volume
Run #1	30.0 ml	2.5 ml
Run #2		

Herbicide TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
94-75-7	2,4-D [a]	ND	D016	10	0.0042	0.0012	mg/l	
93-72-1	2,4,5-TP (Silvex) [a]	ND	D017	1.0	0.0012	0.00025	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	100%		13-169%
19719-28-9	2,4-DCAA	85%		13-169%

(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW_SOLID_062819
Lab Sample ID: JC90936-4
Matrix: SO - Soil
Method: SW846 8081B SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: 82.1

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	8G24743.D	1	07/18/19 14:11	RK	07/17/19 10:00	OP21566	G8G846
Run #2							

	Initial Volume	Final Volume
Run #1	30.0 ml	2.0 ml
Run #2		

Pesticide TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND	D013	0.40	0.000067	0.000040	mg/l	
12789-03-6	Chlordane	ND	D020	0.030	0.0033	0.0014	mg/l	
72-20-8	Endrin	ND	D012	0.020	0.000067	0.000040	mg/l	
76-44-8	Heptachlor	ND	D031	0.0080	0.000067	0.000030	mg/l	
1024-57-3	Heptachlor epoxide	ND	D031	0.0080	0.000067	0.000040	mg/l	
72-43-5	Methoxychlor	ND	D014	10	0.00013	0.000045	mg/l	
8001-35-2	Toxaphene	ND	D015	0.50	0.0017	0.0011	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	89%		30-137%
877-09-8	Tetrachloro-m-xylene	88%		30-137%
2051-24-3	Decachlorobiphenyl	96%		10-137%
2051-24-3	Decachlorobiphenyl	96%		10-137%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW_SOLID_062819
Lab Sample ID: JC90936-4
Matrix: SO - Soil
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: 82.1

Metals Analysis, TCLP Leachate SW846 1311

Analyte	Result	HW#	MCL	RL	MDL	Units	DF	Prep	Analyzed	By	Method
Arsenic	ND	D004	5.0	0.50	0.014	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Barium	1.0	D005	100	1.0	0.067	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Cadmium	ND	D006	1.0	0.020	0.0050	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Chromium	ND	D007	5.0	0.050	0.010	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Lead	0.013 J	D008	5.0	0.50	0.0090	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Mercury	ND	D009	0.20	0.00020	0.000095	mg/l	1	07/12/19	07/12/19	LL	SW846 7470A [1]
Selenium	ND	D010	1.0	0.50	0.025	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Silver	0.011 J	D011	5.0	0.050	0.0095	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]

(1) Instrument QC Batch: MA47085
(2) Instrument QC Batch: MA47089
(3) Prep QC Batch: MP16354
(4) Prep QC Batch: MP16367

RL = Reporting Limit MDL = Method Detection Limit ND = Not detected
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	IDW_SOLID_062819		
Lab Sample ID:	JC90936-4	**Date Sampled:**	06/28/19
Matrix:	SO - Soil	**Date Received:**	06/29/19
		Percent Solids:	82.1
Project:	Pine Avenue, Niagara Falls, NY		

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Corrosivity as pH	9.07 NC			su	1	07/11/19 13:30	MS	SW846 9045D
Cyanide Reactivity	ND	12	9.2	mg/kg	1	07/12/19 16:22	KI	SW846 CHAP7/9012 B
Ignitability (Flashpoint)	> 200			Deg. F	1	07/14/19 15:30	JOO	SW846 1010A/ASTM D93
Solids, Percent	82.1			%	1	07/10/19 15:30	BG	SM2540 G 18TH ED MOD
Sulfide Reactivity	ND	120	73	mg/kg	1	07/12/19 16:16	CM	SW846 CHAP7/9034

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	TRIP BLANK		
Lab Sample ID:	JC90936-5	**Date Sampled:**	06/28/19
Matrix:	AQ - Trip Blank Water	**Date Received:**	06/29/19
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D184006.D	1	07/10/19 06:27	ED	n/a	n/a	V2D7886
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	6.0	ug/l	
71-43-2	Benzene	ND	0.50	0.43	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.48	ug/l	
75-27-4	Bromodichloromethane [a]	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.63	ug/l	
74-83-9	Bromomethane	ND	2.0	1.6	ug/l	
78-93-3	2-Butanone (MEK)	ND	10	6.9	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.95	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.55	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.56	ug/l	
75-00-3	Chloroethane	ND	1.0	0.73	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	1.0	0.76	ug/l	
110-82-7	Cyclohexane	ND	5.0	0.78	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.0	1.2	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.56	ug/l	
106-93-4	1,2-Dibromoethane	ND	1.0	0.48	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.53	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.54	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.51	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.4	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.57	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.60	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.59	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.51	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.51	ug/l	
10061-01-5	cis-1,3-Dichloropropene [b]	ND	1.0	0.47	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.43	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.60	ug/l	
76-13-1	Freon 113	ND	5.0	1.9	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TRIP BLANK		
Lab Sample ID:	JC90936-5	**Date Sampled:**	06/28/19
Matrix:	AQ - Trip Blank Water	**Date Received:**	06/29/19
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	ND	1.0	0.65	ug/l	
79-20-9	Methyl Acetate	ND	5.0	0.80	ug/l	
108-87-2	Methylcyclohexane	ND	5.0	0.60	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.51	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK [a]	ND	5.0	1.9	ug/l	
75-09-2	Methylene chloride	ND	2.0	1.0	ug/l	
100-42-5	Styrene	ND	1.0	0.70	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.65	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.90	ug/l	
108-88-3	Toluene	ND	1.0	0.53	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	0.50	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.54	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.53	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.53	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.84	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.79	ug/l	
	m,p-Xylene	ND	1.0	0.78	ug/l	
95-47-6	o-Xylene	ND	1.0	0.59	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.59	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%		80-120%
17060-07-0	1,2-Dichloroethane-D4	103%		81-124%
2037-26-5	Toluene-D8	102%		80-120%
460-00-4	4-Bromofluorobenzene	109%		80-120%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV and BS outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

WW 50

JC90936

E

Waste Characterization Sampling

CHAIN-OF-CUSTODY / Analytical Request Document

Section A Laboratory Information	Section B Client Information	COC #:	Pine Ave-
Lab Name: SGS - Accutest	Company: Parsons	Project Name:	NYSDEC Standby Contract
Attention: Kristin DeGraw	Attention: Sara Weishaupt	Project Site:	Pine Ave, Niagara Falls NY
Address: Route 2235 Route 130; Dayton, NJ 08810	Address: 301 Plainfield Road,-Suite 350 Syracuse, NY 13212	Project Number:	448433.03
Phone: 732-329-0200	Phone: 315-552-9681		
Email:	Email: Sara.Weishaupt@parsons.com		

Section C Deliverable Requirements	Purchase Order No: 448433.03000
Report To: Sara.Weishaupt@parsons.com	TAT - 10 Day
Copy To: Lorraine.Weber@parsons.com; Heather.Fettig@parsons.com Maryanne.Kosciewicz@parsons.com	**Section D Additional Information**
Deliverables: Level 2, NYSDEC EQUIS EDD	

Preservative codes (for water only): Liquid Sample / Solid Sample

	Location ID	Start Depth (ft)	End Depth (ft)	Field Sample ID MUST BE UNIQUE	Sample Date	Sample Time	Sample Purpose	Sample Matrix	Sample Type	# of Cont.	MS/MSD	Composite (Y/N)	Total TCL VOCs - 8260	Total TCL SVOCs - 8270	Total TCL Pest/Herb - 8081/8151	Total TCL PCBs - 8082	TAL Metals/Hg - 6010B/7470A	Total CN	pH - 9040/SM4500-H+B	Flashpoint - 1010	Reactive CN/Reactive Sulfide	TCLP VOCs, TCLP SVOCs	TCLP Pest, TCLP Herb	TCLP Metals/Hg	Reactive CN, Reactive Sulfide	Corrosivity, Ignitability
											#Bottles																
1	IDW-Water-6/28/19	0	6.5	Pine Ave-010-01	6/28/19	1015	WC	WW	N	14			X	X	X	X	X	X	X	X	X						
2	IDW-Water-6/28/19	0	6.5	Pine Ave-010-02	6/28/19	1030	WC	WW	N	14			X	X	X	X	X	X	X	X	X						
3	IDW-Solid-6/28/19	0	6.5	Pine Ave-010-03	6/28/19	1130	WC	SO	N	4												X	X	X	X	X	•
4	IDW-Solid-6/28/19	0	6.5	Pine Ave-010-04	6/28/19	1145	WC	SO	N	4												X	X	X	X	X	•
5	Trip Blanks *				6/21/19	0700				2																	
6																											
7																											
8																											
9																											
10																											

Special Instructions:

* Added to COC DI 6/25/19
• Rec'd 2x25g encores DI 6/28/19

ALL SAMPLES RECEIVED PRESERVED AS APPLICABLE

INITIAL ASESSMENT 4B

LABEL VERIFICATION

Samplers Name:	Company: Parsons	Relinquished By:	Company:	Cooler Temp.:	Custody Seals Intact: Yes ☐ No ☐
Alex Cook	Date/Time: 6/28/19 1400		Date/Time:	Rec'd on Ice: Yes ☐ No ☐	Samples Intact: Yes ☐ No ☐
Shipment Method:	Shipment Tracking No:	Accepted By: FEDEX	Company:	Cooler Temp.:	Custody Seals Intact: Yes ☑ No ☐
	Date/Time:		Date/Time:	Rec'd on Ice: Yes ☑ No ☐	Samples Intact: Yes ☐ No ☐

Preservatives: 0 = None; [1 = HCL]; [2 = HNO3]; [3 = H2SO4]; [4 = NaOH]; [5 = Zn Acetate]; [6 = MeOH]; [7 = NaHSO4]; 8 = Other (H3PO4):

Relinquished by: FEDEX 6/29/19 0940

Rec'd by:

FEDEX 1019 2801 7940
1019 2801 7930

3.0°C IP IR278
3.9°C IP
TR278

C:\Users\p006976d\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\IHYL7PGO\Pine Ave COC for Waste.xlsx

FZ8 GZ AS 67 V37 D28 HSTZ

SGS Sample Receipt Summary

Job Number: JC90936 **Client:** **Project:**

Date / Time Received: 6/29/2019 9:40:00 AM **Delivery Method:** **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (3.6); Cooler 2: (3.9);

Cooler Temps (Corrected) °C: Cooler 1: (3.2); Cooler 2: (3.5);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	2		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☑		☐	☐
2. Trip Blank listed on COC:	☑		☐	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☑		☐	☐

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Test Strip Lot #s: pH 1-12: 229517 pH 12+: 208717 Other: (Specify)

Comments

SM089-03
Rev. Date 12/7/17

JC90936: Chain of Custody
Page 2 of 2

Technical Report for

Parsons Engineering Science

Pine Avenue, Niagara Falls, NY

448433.03000

SGS Job Number: JC94178

Sampling Date: 08/29/19

Report to:

Parsons
301 Plainfield Road, Suite 350
Syracuse, NY 13212
Sara.Weishaupt@parsons.com

ATTN: Sara Weishaupt

Total number of pages in report: 5

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Mike Earp
General Manager

Client Service contact: Kristin Degraw 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

This report shall not be reproduced, except in its entirety, without the written approval of SGS.
Test results relate only to samples analyzed.

Sample Summary

Parsons Engineering Science

Job No: JC94178

Pine Avenue, Niagara Falls, NY
Project No: 448433.03000

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
JC94178-1	08/29/19	13:00	SW	08/30/19	SO	Soil	PINE AVE-011-01
JC94178-2	08/29/19	13:06	SW	08/30/19	SO	Soil	PINE AVE-011-02

This report contains results reported as ND = Not detected. The following applies:
Metals ND = Not detected above the MDL
General Chemistry ND = Not detected above the MDL

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Report of Analysis

Client Sample ID: PINE AVE-011-01
Lab Sample ID: JC94178-1
Matrix: SO - Soil
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 08/29/19
Date Received: 08/30/19
Percent Solids: 75.4

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	22600	65	10	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Antimony	ND	2.6	0.53	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Arsenic	8.4	2.6	0.36	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Barium	200	26	2.5	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Beryllium	1.2	0.26	0.10	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Cadmium [a]	0.55 J	1.3	0.18	mg/kg	2	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Calcium	18300	650	57	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Chromium	80.7	1.3	0.48	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Cobalt	17.6	6.5	0.36	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Copper [a]	33.9	6.5	2.2	mg/kg	2	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Iron	38000	130	50	mg/kg	2	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Lead	93.9	2.6	0.53	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Magnesium	10000	650	18	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Manganese [a]	996	3.9	1.1	mg/kg	2	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Mercury	0.82	0.041	0.018	mg/kg	1	09/04/19	09/04/19	LL	SW846 7471B [2]	SW846 7471B [5]
Nickel	38.2	5.2	0.46	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Potassium	3380	1300	41	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Selenium [a]	ND	5.2	1.7	mg/kg	2	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Silver [a]	ND	1.3	0.44	mg/kg	2	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Sodium	330 J	1300	100	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Thallium [a]	ND	2.6	1.5	mg/kg	2	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Vanadium	40.2	6.5	0.25	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Zinc	191	6.5	3.0	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]

(1) Instrument QC Batch: MA47380
(2) Instrument QC Batch: MA47385
(3) Instrument QC Batch: MA47391
(4) Prep QC Batch: MP17106
(5) Prep QC Batch: MP17143

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID: PINE AVE-011-02
Lab Sample ID: JC94178-2
Matrix: SO - Soil
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 08/29/19
Date Received: 08/30/19
Percent Solids: 75.8

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	30900	63	10	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Antimony	ND	2.5	0.52	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Arsenic [a]	10.8 J	13	1.8	mg/kg	5	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Barium	205	25	2.4	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Beryllium	1.7	0.25	0.10	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Cadmium [a]	ND	3.1	0.44	mg/kg	5	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Calcium	48600	3100	280	mg/kg	5	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Chromium	72.0	1.3	0.46	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Cobalt	15.1	6.3	0.35	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Copper [a]	28.4	16	5.3	mg/kg	5	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Iron	62900	310	120	mg/kg	5	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Lead	11.8	2.5	0.52	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Magnesium	13100	630	17	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Manganese [a]	511	9.4	2.6	mg/kg	5	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Mercury	ND	0.043	0.019	mg/kg	1	09/04/19	09/04/19	LL	SW846 7471B [2]	SW846 7471B [5]
Nickel	39.3	5.0	0.44	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Potassium	4720	1300	40	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Selenium [a]	ND	13	4.1	mg/kg	5	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Silver [a]	ND	3.1	1.1	mg/kg	5	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Sodium	685 J	1300	98	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Thallium [a]	ND	6.3	3.6	mg/kg	5	08/31/19	09/04/19	EAL	SW846 6010D [3]	SW846 3050B [4]
Vanadium	46.4	6.3	0.24	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]
Zinc	57.5	6.3	2.9	mg/kg	1	08/31/19	09/04/19	EAL	SW846 6010D [1]	SW846 3050B [4]

(1) Instrument QC Batch: MA47380
(2) Instrument QC Batch: MA47385
(3) Instrument QC Batch: MA47391
(4) Prep QC Batch: MP17106
(5) Prep QC Batch: MP17143

(a) Elevated detection limit due to dilution required for matrix interference (indicated by failing internal standard on original analysis).

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Parsons Engineering Science

Pine Avenue, Niagara Falls, NY

448433.03000

SGS Job Number: JC94844

Sampling Date: 09/11/19



Report to:

Parsons Engineering Science

Heather.Fettig@parsons.com

ATTN: Heather Fettig

Total number of pages in report: **13**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Mike Earp
General Manager

Client Service contact: Kristin Degraw 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

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Test results relate only to samples analyzed.

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EHS.US.CustomerCare@sgs.com

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Sample Summary

Parsons Engineering Science

Job No: JC94844

Pine Avenue, Niagara Falls, NY
Project No: 448433.03000

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
This report contains results reported as ND = Not detected. The following applies:							
Organics ND = Not detected above the MDL							
General Chemistry ND = Not detected above the MDL							
JC94844-1	09/11/19	09:40	WC	09/12/19	SO	Soil	IDW SOLID_091119_1
JC94844-2	09/11/19	09:50	WC	09/12/19	SO	Soil	IDW SOLID_091119_2

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Parsons Engineering Science	**Job No**	JC94844
Site:	Pine Avenue, Niagara Falls, NY	**Report Date**	9/16/2019 11:33:50 A

On 09/12/2019, 2 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 4 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC94844 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

MS Volatiles By Method SW846 8260C

Matrix: SO **Batch ID:** V2B7796

- All samples were analyzed within the recommended method holding time.
- Sample(s) JC94412-3MS, JC94412-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix: SO **Batch ID:** VI9209

- All samples were analyzed within the recommended method holding time.
- Sample(s) JC94713-6MS, JC94713-18DUP were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

General Chemistry By Method SM2540 G 18TH ED MOD

Matrix: SO **Batch ID:** GN99886

- Sample(s) JC94129-3DUP were used as the QC samples for Solids, Percent.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Summary of Hits

Job Number: JC94844
Account: Parsons Engineering Science
Project: Pine Avenue, Niagara Falls, NY
Collected: 09/11/19

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC94844-1	**IDW SOLID_091119_1**					
cis-1,2-Dichloroethene		3170	190	160	ug/kg	SW846 8260C
trans-1,2-Dichloroethene		0.99 J	1.6	0.97	ug/kg	SW846 8260C
Tetrachloroethene		85.2	3.2	0.92	ug/kg	SW846 8260C
Trichloroethene		10.8	1.6	1.2	ug/kg	SW846 8260C
JC94844-2	**IDW SOLID_091119_2**					
cis-1,2-Dichloroethene		82.9	1.1	0.88	ug/kg	SW846 8260C
trans-1,2-Dichloroethene		2.2	1.1	0.64	ug/kg	SW846 8260C
1,2-Dichloropropane		1.1 J	2.1	0.50	ug/kg	SW846 8260C
Tetrachloroethene		62.3	2.1	0.61	ug/kg	SW846 8260C
Trichloroethene		21.7	1.1	0.80	ug/kg	SW846 8260C
Vinyl chloride		0.91 J	2.1	0.51	ug/kg	SW846 8260C

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: IDW SOLID_091119_1
Lab Sample ID: JC94844-1
Matrix: SO - Soil
Method: SW846 8260C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 09/11/19
Date Received: 09/12/19
Percent Solids: 73.4

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I228402.D	1	09/13/19 10:24	TDN	n/a	n/a	VI9209
Run #2	2B172117.D	1	09/13/19 15:50	TDN	n/a	n/a	V2B7796

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.3 g		
Run #2	3.9 g	10.0 ml	100 ul

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	16	6.4	ug/kg	
71-43-2	Benzene	ND	0.79	0.72	ug/kg	
74-97-5	Bromochloromethane	ND	7.9	0.89	ug/kg	
75-27-4	Bromodichloromethane	ND	3.2	0.70	ug/kg	
75-25-2	Bromoform	ND	7.9	0.91	ug/kg	
74-83-9	Bromomethane	ND	7.9	1.6	ug/kg	
78-93-3	2-Butanone (MEK)	ND	16	5.9	ug/kg	
75-15-0	Carbon disulfide	ND	3.2	1.5	ug/kg	
56-23-5	Carbon tetrachloride	ND	3.2	0.98	ug/kg	
108-90-7	Chlorobenzene	ND	3.2	0.73	ug/kg	
75-00-3	Chloroethane	ND	7.9	0.94	ug/kg	
67-66-3	Chloroform	ND	3.2	0.77	ug/kg	
74-87-3	Chloromethane	ND	7.9	3.1	ug/kg	
110-82-7	Cyclohexane	ND	3.2	1.0	ug/kg	
96-12-8	1,2-Dibromo-3-chloropropane	ND	3.2	1.3	ug/kg	
124-48-1	Dibromochloromethane	ND	3.2	0.89	ug/kg	
106-93-4	1,2-Dibromoethane	ND	1.6	0.67	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	1.6	0.86	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	1.6	0.79	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	1.6	0.78	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	7.9	1.2	ug/kg	
75-34-3	1,1-Dichloroethane	ND	1.6	0.78	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.6	0.74	ug/kg	
75-35-4	1,1-Dichloroethene	ND	1.6	1.0	ug/kg	
156-59-2	cis-1,2-Dichloroethene	3170 [a]	190	160	ug/kg	
156-60-5	trans-1,2-Dichloroethene	0.99	1.6	0.97	ug/kg	J
78-87-5	1,2-Dichloropropane	ND	3.2	0.75	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	3.2	0.75	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	3.2	0.72	ug/kg	
100-41-4	Ethylbenzene	ND	1.6	0.87	ug/kg	
76-13-1	Freon 113	ND	7.9	1.6	ug/kg	
591-78-6	2-Hexanone	ND	7.9	3.4	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW SOLID_091119_1
Lab Sample ID: JC94844-1
Matrix: SO - Soil
Method: SW846 8260C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 09/11/19
Date Received: 09/12/19
Percent Solids: 73.4

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	ND	3.2	1.1	ug/kg	
79-20-9	Methyl Acetate	ND	7.9	2.2	ug/kg	
108-87-2	Methylcyclohexane	ND	3.2	1.4	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.6	0.74	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	7.9	3.6	ug/kg	
75-09-2	Methylene chloride	ND	7.9	1.6	ug/kg	
100-42-5	Styrene	ND	3.2	0.91	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	3.2	0.95	ug/kg	
127-18-4	Tetrachloroethene	85.2	3.2	0.92	ug/kg	
108-88-3	Toluene	ND	1.6	0.83	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	7.9	3.1	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	7.9	2.4	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	3.2	0.77	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	3.2	0.88	ug/kg	
79-01-6	Trichloroethene	10.8	1.6	1.2	ug/kg	
75-69-4	Trichlorofluoromethane	ND	7.9	1.1	ug/kg	
75-01-4	Vinyl chloride	ND	3.2	0.76	ug/kg	
	m,p-Xylene	ND	1.6	1.4	ug/kg	
95-47-6	o-Xylene	ND	1.6	0.92	ug/kg	
1330-20-7	Xylene (total)	ND	1.6	0.92	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%	101%	75-127%
17060-07-0	1,2-Dichloroethane-D4	128%	101%	75-130%
2037-26-5	Toluene-D8	96%	101%	80-120%
460-00-4	4-Bromofluorobenzene	104%	96%	79-127%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW SOLID_091119_2
Lab Sample ID: JC94844-2
Matrix: SO - Soil
Method: SW846 8260C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 09/11/19
Date Received: 09/12/19
Percent Solids: 76.8

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I228403.D	1	09/13/19 10:53	TDN	n/a	n/a	VI9209
Run #2							

	Initial Weight
Run #1	6.2 g
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	11	4.2	ug/kg	
71-43-2	Benzene	ND	0.53	0.48	ug/kg	
74-97-5	Bromochloromethane	ND	5.3	0.59	ug/kg	
75-27-4	Bromodichloromethane	ND	2.1	0.47	ug/kg	
75-25-2	Bromoform	ND	5.3	0.61	ug/kg	
74-83-9	Bromomethane	ND	5.3	1.0	ug/kg	
78-93-3	2-Butanone (MEK)	ND	11	3.9	ug/kg	
75-15-0	Carbon disulfide	ND	2.1	0.98	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.1	0.65	ug/kg	
108-90-7	Chlorobenzene	ND	2.1	0.48	ug/kg	
75-00-3	Chloroethane	ND	5.3	0.62	ug/kg	
67-66-3	Chloroform	ND	2.1	0.51	ug/kg	
74-87-3	Chloromethane	ND	5.3	2.1	ug/kg	
110-82-7	Cyclohexane	ND	2.1	0.69	ug/kg	
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.1	0.88	ug/kg	
124-48-1	Dibromochloromethane	ND	2.1	0.59	ug/kg	
106-93-4	1,2-Dibromoethane	ND	1.1	0.44	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	1.1	0.57	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	1.1	0.52	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	1.1	0.52	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	5.3	0.76	ug/kg	
75-34-3	1,1-Dichloroethane	ND	1.1	0.52	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.1	0.49	ug/kg	
75-35-4	1,1-Dichloroethene	ND	1.1	0.69	ug/kg	
156-59-2	cis-1,2-Dichloroethene	82.9	1.1	0.88	ug/kg	
156-60-5	trans-1,2-Dichloroethene	2.2	1.1	0.64	ug/kg	
78-87-5	1,2-Dichloropropane	1.1	2.1	0.50	ug/kg	J
10061-01-5	cis-1,3-Dichloropropene	ND	2.1	0.50	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.1	0.48	ug/kg	
100-41-4	Ethylbenzene	ND	1.1	0.58	ug/kg	
76-13-1	Freon 113	ND	5.3	1.1	ug/kg	
591-78-6	2-Hexanone	ND	5.3	2.2	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW SOLID_091119_2
Lab Sample ID: JC94844-2
Matrix: SO - Soil
Method: SW846 8260C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 09/11/19
Date Received: 09/12/19
Percent Solids: 76.8

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	ND	2.1	0.73	ug/kg	
79-20-9	Methyl Acetate	ND	5.3	1.5	ug/kg	
108-87-2	Methylcyclohexane	ND	2.1	0.92	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.1	0.49	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.3	2.4	ug/kg	
75-09-2	Methylene chloride	ND	5.3	1.0	ug/kg	
100-42-5	Styrene	ND	2.1	0.60	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.1	0.63	ug/kg	
127-18-4	Tetrachloroethene	62.3	2.1	0.61	ug/kg	
108-88-3	Toluene	ND	1.1	0.55	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.3	2.0	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.3	1.6	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.1	0.51	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.1	0.58	ug/kg	
79-01-6	Trichloroethene	21.7	1.1	0.80	ug/kg	
75-69-4	Trichlorofluoromethane	ND	5.3	0.72	ug/kg	
75-01-4	Vinyl chloride	0.91	2.1	0.51	ug/kg	J
	m,p-Xylene	ND	1.1	0.94	ug/kg	
95-47-6	o-Xylene	ND	1.1	0.61	ug/kg	
1330-20-7	Xylene (total)	ND	1.1	0.61	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		75-127%
17060-07-0	1,2-Dichloroethane-D4	124%		75-130%
2037-26-5	Toluene-D8	94%		80-120%
460-00-4	4-Bromofluorobenzene	104%		79-127%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

50

KD1-09919-168

JC94844

Waste Characterization Sampling

CHAIN-OF-CUSTODY / Analytical Request Document

Section A Laboratory Information	Section B Client Information	COC #:	Pine AVE-012
Lab Name: SGS - Accutest	Company: Parsons	Project Name:	NYSDEC Standby Contract
Attention: Kristin DeGraw	Attention: Sara Weishaupt	Project Site:	Pine Ave, Niagara Falls NY
Address: Route 2235 Route 130; Dayton, NJ 08810	Address: 301 Plainfield Road,-Suite 350 Syracuse, NY 13212	Project Number:	448433.05
Phone: 732-329-0200	Phone: 315-552-9681		
Email:	Email: Sara.Weishaupt@parsons.com		
Section C Deliverable Requirements	Purchase Order No: 448433.03000		
Report To: Sara.Weishaupt@parsons.com	**TAT - 2 Day**		
Copy To: Lorraine.Weber@parsons.com; Heather.Fettig@parsons.com Maryanne.Kosciewicz@parsons.com	**Section D Additional Information**		
Deliverables: Level 2, NYSDEC EQUIS EDD			

Preservative codes (for water only):

Soil Sample

| | Location ID | Start Depth (ft) | End Depth (ft) | Field Sample ID MUST BE UNIQUE | Sample Date | Sample Time | Sample Purpose | Sample Matrix | Sample Type | # of Cont. | MS/MSD | Composite (Y/N) | VOCs (SW-846, Method 8260B) | | |

SGS Sample Receipt Summary

Job Number: JC94844 **Client:** PARSONS **Project:** PINE AVENUE, NIAGARA FALLS, NY

Date / Time Received: 9/12/2019 10:20:00 AM **Delivery Method:** **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (4.1);

Cooler Temps (Corrected) °C: Cooler 1: (4.0);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	1		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☑	☐
2. Trip Blank listed on COC:	☐		☑	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Test Strip Lot #s: pH 1-12: 229517 pH 12+: 208717 Other: (Specify)

Comments

SM089-03
Rev. Date 12/7/17

JC94844: Chain of Custody
Page 2 of 2

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Parsons Engineering Science

Pine Avenue, Niagara Falls, NY

448433.03000

SGS Job Number: JD349



Sampling Date: 12/13/19

Report to:

Parsons Engineering Science

Heather.Fettig@parsons.com

ATTN: Heather Fettig

Total number of pages in report: **18**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Laura Degenhardt
General Manager

Client Service contact: Kristin Degraw 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

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EHS.US.CustomerCare@sgs.com

Sections:

1 2 3 4 5

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Sample Summary

Parsons Engineering Science

Job No: JD349

Pine Avenue, Niagara Falls, NY
Project No: 448433.03000

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JD349-1	12/13/19	09:15		12/14/19	SO	Soil	IDW SOLID_121319-01

This report contains results reported as ND = Not detected. The following applies:

Organics ND = Not detected above the MDL
Metals ND = Not detected above the MDL
General Chemistry ND = Not detected above the MDL

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Parsons Engineering Science **Job No** JD349

Site: Pine Avenue, Niagara Falls, NY **Report Date** 1/7/2020 9:51:01 AM

On 12/14/2019, 1 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 1.9 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JD349 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

MS Volatiles By Method SW846 8260C

Matrix: LEACHATE **Batch ID:** V2V2647

- All samples were analyzed within the recommended method holding time.
- Sample(s) JD585-1MS, JD585-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

MS Semi-volatiles By Method SW846 8270D

Matrix: LEACHATE **Batch ID:** OP24813

- All samples were extracted within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD601-1ALS, JD601-1AMS, JD601-1AMSD were used as the QC samples indicated.
- JD349-1 for 2,4-Dinitrotoluene: Associated CCV outside of control limits high, sample was ND.

GC/LC Semi-volatiles By Method SW846 8081B

Matrix: LEACHATE **Batch ID:** OP24815

- All samples were extracted within the recommended method holding time.
- Sample(s) JD544-1LS, JD544-1MS, JD544-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

GC/LC Semi-volatiles By Method SW846 8151A

Matrix: LEACHATE **Batch ID:** OP24818

- All samples were extracted within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD544-1LS, JD544-1MS, JD544-1MSD were used as the QC samples indicated.

Metals Analysis By Method SW846 6010D

Matrix: LEACHATE **Batch ID:** MP18996

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD601-3AMS, JD601-3AMSD, JD601-3ASDL were used as the QC samples for metals.
- RPD(s) for Serial Dilution for Cadmium are outside control limits for sample MP18996-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- Samples(s) JD349-1: New York does not offer 3010A certification for antimony and silver. The laboratory is certified for method 3010A (Acid Digestion for Total Metals) for all other metals and is certified for the associated analytical methods of 6010C (ICP Analysis) and 6020A (ICP-MS Analysis). New York does certify for method 3005A (Acid Digestion for Total Recoverable or Dissolved Metals) for antimony and silver and the laboratory holds that certification, but that provides total recoverable rather than total metals results.

Metals Analysis By Method SW846 7470A

Matrix: LEACHATE **Batch ID:** MP19016

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD601-3AMS, JD601-3AMSD were used as the QC samples for metals.

General Chemistry By Method SM2540 G 18TH ED MOD

Matrix: SO **Batch ID:** GN3673

- Sample(s) JD349-1DUP were used as the QC samples for Solids, Percent.

General Chemistry By Method SW846 1010A/ASTM D93

Matrix: SO **Batch ID:** GN3838

- Sample(s) JD349-1DUP were used as the QC samples for Ignitability (Flashpoint).

General Chemistry By Method SW846 9045D

Matrix: SO **Batch ID:** GN3628

- Sample(s) JD311-6DUP were used as the QC samples for Corrosivity as pH.

General Chemistry By Method SW846 CHAP7/9012 B

Matrix: SO **Batch ID:** GP25814

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD312-50DUP were used as the QC samples for Cyanide Reactivity.

General Chemistry By Method SW846 CHAP7/9034

Matrix: SO **Batch ID:** GP25813

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JD312-50DUP, JD312-50MS were used as the QC samples for Sulfide Reactivity.
- Matrix Spike Recovery(s) for Sulfide Reactivity are outside control limits. Spike recovery indicates possible matrix interference.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Summary of Hits

Job Number: JD349
Account: Parsons Engineering Science
Project: Pine Avenue, Niagara Falls, NY
Collected: 12/13/19

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JD349-1	**IDW SOLID_121319-01**					
Corrosivity as pH		10.52 NC			su	SW846 9045D
Ignitability (Flashpoint)		> 200			Deg. F	SW846 1010A/ASTM D93
gamma-BHC (Lindane)		0.00013	0.000067	0.000040	mg/l	SW846 8081B
Barium		0.65 J	1.0	0.067	mg/l	SW846 6010D
Chromium		0.039 J	0.050	0.010	mg/l	SW846 6010D

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: IDW SOLID_121319-01
Lab Sample ID: JD349-1
Matrix: SO - Soil
Method: SW846 8260C SW846 1311
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 12/13/19
Date Received: 12/14/19
Percent Solids: 77.0

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2V64229.D	5	12/26/19 20:51	EH	12/20/19 19:50	GP25762	V2V2647
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
71-43-2	Benzene	ND	D018	0.50	0.0025	0.0021	mg/l	
78-93-3	2-Butanone (MEK)	ND	D035	200	0.10	0.034	mg/l	
56-23-5	Carbon tetrachloride	ND	D019	0.50	0.0050	0.0028	mg/l	
108-90-7	Chlorobenzene	ND	D021	100	0.0050	0.0028	mg/l	
67-66-3	Chloroform	ND	D022	6.0	0.0050	0.0025	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.0050	0.0025	mg/l	
107-06-2	1,2-Dichloroethane	ND	D028	0.50	0.0050	0.0030	mg/l	
75-35-4	1,1-Dichloroethene	ND	D029	0.70	0.0050	0.0030	mg/l	
127-18-4	Tetrachloroethene	ND	D039	0.70	0.0050	0.0045	mg/l	
79-01-6	Trichloroethene	ND	D040	0.50	0.0050	0.0026	mg/l	
75-01-4	Vinyl chloride	ND	D043	0.20	0.0050	0.0039	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		76-120%
17060-07-0	1,2-Dichloroethane-D4	92%		64-135%
2037-26-5	Toluene-D8	103%		76-117%
460-00-4	4-Bromofluorobenzene	100%		72-122%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW SOLID_121319-01
Lab Sample ID: JD349-1
Matrix: SO - Soil
Method: SW846 8270D SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 12/13/19
Date Received: 12/14/19
Percent Solids: 77.0

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F189441.D	1	12/27/19 11:42	AR	12/26/19 22:00	OP24813	EF8169
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	1.0 ml
Run #2		

ABN TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	D023	200	0.020	0.0089	mg/l	
	3&4-Methylphenol	ND	D024	200	0.020	0.0088	mg/l	
87-86-5	Pentachlorophenol	ND	D037	100	0.10	0.014	mg/l	
95-95-4	2,4,5-Trichlorophenol	ND	D041	400	0.050	0.013	mg/l	
88-06-2	2,4,6-Trichlorophenol	ND	D042	2.0	0.050	0.0092	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.020	0.0017	mg/l	
121-14-2	2,4-Dinitrotoluene [a]	ND	D030	0.13	0.020	0.0055	mg/l	
118-74-1	Hexachlorobenzene	ND	D032	0.13	0.020	0.0033	mg/l	
87-68-3	Hexachlorobutadiene	ND	D033	0.50	0.010	0.0049	mg/l	
67-72-1	Hexachloroethane	ND	D034	3.0	0.050	0.0039	mg/l	
98-95-3	Nitrobenzene	ND	D036	2.0	0.020	0.0064	mg/l	
110-86-1	Pyridine	ND	D038	5.0	0.020	0.0039	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	23%		10-73%
4165-62-2	Phenol-d5	16%		10-64%
118-79-6	2,4,6-Tribromophenol	97%		31-130%
4165-60-0	Nitrobenzene-d5	82%		28-126%
321-60-8	2-Fluorobiphenyl	58%		26-114%
1718-51-0	Terphenyl-d14	106%		16-122%

(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW SOLID_121319-01
Lab Sample ID: JD349-1
Matrix: SO - Soil
Method: SW846 8151A SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 12/13/19
Date Received: 12/14/19
Percent Solids: 77.0

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G126010.D	1	12/30/19 12:06	VDT	12/29/19 08:00	OP24818	G3G4469
Run #2							

	Initial Volume	Final Volume
Run #1	30.0 ml	2.5 ml
Run #2		

Herbicide TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
94-75-7	2,4-D	ND	D016	10	0.0042	0.0012	mg/l	
93-72-1	2,4,5-TP (Silvex)	ND	D017	1.0	0.0012	0.00025	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	75%		13-169%
19719-28-9	2,4-DCAA	54%		13-169%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW SOLID_121319-01
Lab Sample ID: JD349-1
Matrix: SO - Soil
Method: SW846 8081B SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 12/13/19
Date Received: 12/14/19
Percent Solids: 77.0

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4G963531.D	1	12/26/19 19:05	AB	12/26/19 07:00	OP24815	G4G2952
Run #2							

	Initial Volume	Final Volume
Run #1	30.0 ml	2.0 ml
Run #2		

Pesticide TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	0.00013	D013	0.40	0.000067	0.000040	mg/l	
12789-03-6	Chlordane	ND	D020	0.030	0.0033	0.0014	mg/l	
72-20-8	Endrin	ND	D012	0.020	0.000067	0.000040	mg/l	
76-44-8	Heptachlor	ND	D031	0.0080	0.000067	0.000030	mg/l	
1024-57-3	Heptachlor epoxide	ND	D031	0.0080	0.000067	0.000040	mg/l	
72-43-5	Methoxychlor	ND	D014	10	0.00013	0.000045	mg/l	
8001-35-2	Toxaphene	ND	D015	0.50	0.0017	0.0011	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%		30-137%
877-09-8	Tetrachloro-m-xylene	77%		30-137%
2051-24-3	Decachlorobiphenyl	78%		10-137%
2051-24-3	Decachlorobiphenyl	71%		10-137%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW SOLID_121319-01
Lab Sample ID: JD349-1
Matrix: SO - Soil
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 12/13/19
Date Received: 12/14/19
Percent Solids: 77.0

Metals Analysis, TCLP Leachate SW846 1311

Analyte	Result	HW#	MCL	RL	MDL	Units	DF	Prep	Analyzed	By	Method
Arsenic	ND	D004	5.0	0.50	0.014	mg/l	5	12/23/19	12/25/19	RP	SW846 6010D [2]
Barium	0.65 J	D005	100	1.0	0.067	mg/l	5	12/23/19	12/25/19	RP	SW846 6010D [2]
Cadmium	ND	D006	1.0	0.020	0.0050	mg/l	5	12/23/19	12/25/19	RP	SW846 6010D [2]
Chromium	0.039 J	D007	5.0	0.050	0.010	mg/l	5	12/23/19	12/25/19	RP	SW846 6010D [2]
Lead	ND	D008	5.0	0.50	0.0090	mg/l	5	12/23/19	12/25/19	RP	SW846 6010D [2]
Mercury	ND	D009	0.20	0.00020	0.000095	mg/l	1	12/23/19	12/23/19	LL	SW846 7470A [1]
Selenium	ND	D010	1.0	0.50	0.025	mg/l	5	12/23/19	12/25/19	RP	SW846 6010D [2]
Silver	ND	D011	5.0	0.050	0.0095	mg/l	5	12/23/19	12/25/19	RP	SW846 6010D [2]

(1) Instrument QC Batch: MA47998
(2) Instrument QC Batch: MA48007
(3) Prep QC Batch: MP18996
(4) Prep QC Batch: MP19016

RL = Reporting Limit MDL = Method Detection Limit ND = Not detected
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID: IDW SOLID_121319-01
Lab Sample ID: JD349-1
Matrix: SO - Soil
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 12/13/19
Date Received: 12/14/19
Percent Solids: 77.0

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Corrosivity as pH	10.52 NC			su	1	12/18/19 17:10	JW	SW846 9045D
Cyanide Reactivity	ND	13	9.7	mg/kg	1	12/24/19 13:43	KI	SW846 CHAP7/9012 B
Ignitability (Flashpoint)	> 200			Deg. F	1	12/24/19 12:46	JOO	SW846 1010A/ASTM D93
Solids, Percent	77			%	1	12/19/19 16:50	BG	SM2540 G 18TH ED MOD
Sulfide Reactivity	ND	130	76	mg/kg	1	12/24/19 14:53	BM	SW846 CHAP7/9034

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: JD349
Account: PESNYL Parsons Engineering Science
Project: Pine Avenue, Niagara Falls, NY

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
Cyanide Reactivity		**SW846 CHAP7/9012 B**	SO	SGS is not certified for this parameter.[a]
Sulfide Reactivity		**SW846 CHAP7/9034**	SO	SGS is not certified for this parameter.[a]

(a) Reactivity analyzed following SW846 Chapter 7 is no longer recognized by regulatory agencies. Use of results should be verified through the program to which the data is being submitted.

Certification exceptions shown are based on the New Jersey DEP certifications. Applicability in other states may vary. Please contact your laboratory representative if additional information is required for a specific regulatory program.

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JD349

Waste Characterization Sampling

CHAIN-OF-CUSTODY / Analytical Request Document

Section A Laboratory Information
Lab Name: SGS - Accutest
Attention: Kristin DeGraw
Address: Route 2235 Route 130; Dayton, NJ 08810
Phone: 732-329-0200
Email:

Section B Client Information
Company: Parsons
Attention: Sara Weishaupt
Address: 301 Plainfield Road, Suite 350 Syracuse, NY 13212
Phone: 315-552-9681
Email: Sara.Weishaupt@parsons.com

COC #: Pine Ave-013
Project Name: NYSDEC Standby Contract
Project Site: Pine Ave, Niagara Falls NY
Project Number: 448433.03

Section C Deliverable Requirements
Report To: Sara.Weishaupt@parsons.com
Copy To: Lorraine.Weber@parsons.com; Heather.Fettig@parsons.com
Maryanne.Kosciewicz@parsons.com
Deliverables: Level 2, NYSDEC EQUIS EDD

Purchase Order No: 448433.03000
TAT - 10 Day

Section D Additional Information

Preservative codes (for water only): Liquid Sample / Solid Sample

	Location ID	Start Depth (ft)	End Depth (ft)	Field Sample ID MUST BE UNIQUE	Sample Date	Sample Time	Sample Purpose	Sample Matrix	Sample Type	# of Cont.	PCB/NOD	Composite (Y/N)	Total TCL VOCs - 8260	Total TCL SVOCs - 8270	Total TCL Pest/Herb - 8081/8151	Total TCL PCBs - 8082	TAL Metals/Hg - 6010B/7470A	Total CN	pH - 9040/9045/9014+9	Flashpoint - 1010	Reactive CN/Reactive Sulfide	TCLP VOCs, TCLP SVOCs	TCLP Pest, TCLP Herb	TCLP Metals/Hg	Reactive CN, Reactive Sulfide	Corrosivity, Ignitability
										#Bottles																
1	IDW SOLID_121319-01	0	3	PineAve-013-01	12/13/19	0915	N	IDW	WC	2												X	X	X	X	X
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										

DIS 97

Special Instructions:

INITIAL ASESSMENT 38 DM

LABEL VERIFICATION__

Samplers Name:	Company:	Relinquished By:	Company:	Cooler Temp.:	Custody Seals Intact: Yes ☐ No ☐
Alison Cook	Parsons 12/13/19 1000	Alison Cook	Date/Time:	Rec'd on Ice: Yes ☐ No ☐	Samples Intact: Yes ☐ No ☐
Shipment Method: FX	Shipment Tracking No:	Accepted By:	Company:	Cooler Temp.: 2.1 C	Custody Seals Intact: Yes ☐ No ☐
	Date/Time:		Date/Time: 12/14/19 12:10	Rec'd on Ice: Yes ☑ No ☐	Samples Intact: Yes ☐ No ☐

Preservatives: 0 = None; [1 = HCL]; [2 = HNO3]; [3 = H2SO4]; [4 = NaOH]; [5 = Zn Acetate]; [6 = MeOH]; [7 = NaHSO4]; 8 = Other (H3PO4):

IR-7 ICR ✓

https://parsons365-my.sharepoint.com/personal/alison_cook_parsons_com/Documents/Desktop/Pine Ave/PineAve-013_Template.xlsx

JD349: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: JD349 **Client:** _____ **Project:** _____

Date / Time Received: 12/14/2019 10:10:00 AM **Delivery Method:** _____ **Airbill #'s:** _____

Cooler Temps (Raw Measured) °C: Cooler 1: (2.1);

Cooler Temps (Corrected) °C: Cooler 1: (1.9);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	1		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☑	☐
2. Trip Blank listed on COC:	☐		☑	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Test Strip Lot #s: pH 1-12: 229517 pH 12+: 208717 Other: (Specify) _____ _____

Comments

SM089-03
Rev. Date 12/7/17

JD349: Chain of Custody
Page 2 of 2

APPENDIX D.2 LIQUID WASTE LABORATORY REPORTS

Sample Summary

Parsons Engineering Science

Job No: JC90936

Pine Avenue, Niagara Falls, NY
Project No: 448433.03000

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC90936-1	06/28/19	10:15	AC	06/29/19	AQ	Water	IDW-WATER_06/28/19
JC90936-2	06/28/19	10:30	AC	06/29/19	AQ	Water	IDW-WATER_06/28/19
JC90936-3	06/28/19	11:30	AC	06/29/19	SO	Soil	IDW_SOLID_062819
JC90936-4	06/28/19	11:45	AC	06/29/19	SO	Soil	IDW_SOLID_062819
JC90936-5	06/28/19	11:45	AC	06/29/19	AQ	Trip Blank Water	TRIP BLANK

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-1
Matrix: AQ - Water
Method: SW846 8260C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	2D184002.D	250	07/10/19 04:28	ED	n/a	n/a	V2D7886
Run #2	2D184003.D	2500	07/10/19 04:57	ED	n/a	n/a	V2D7886

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	2500	1500	ug/l	
71-43-2	Benzene	ND	130	110	ug/l	
74-97-5	Bromochloromethane	ND	250	120	ug/l	
75-27-4	Bromodichloromethane [b]	ND	250	150	ug/l	
75-25-2	Bromoform	ND	250	160	ug/l	
74-83-9	Bromomethane	ND	500	410	ug/l	
78-93-3	2-Butanone (MEK)	ND	2500	1700	ug/l	
75-15-0	Carbon disulfide	ND	500	240	ug/l	
56-23-5	Carbon tetrachloride	ND	250	140	ug/l	
108-90-7	Chlorobenzene	ND	250	140	ug/l	
75-00-3	Chloroethane	ND	250	180	ug/l	
67-66-3	Chloroform	ND	250	130	ug/l	
74-87-3	Chloromethane	ND	250	190	ug/l	
110-82-7	Cyclohexane	ND	1300	200	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	500	300	ug/l	
124-48-1	Dibromochloromethane	ND	250	140	ug/l	
106-93-4	1,2-Dibromoethane	ND	250	120	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	250	130	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	250	140	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	250	130	ug/l	
75-71-8	Dichlorodifluoromethane	ND	500	340	ug/l	
75-34-3	1,1-Dichloroethane	ND	250	140	ug/l	
107-06-2	1,2-Dichloroethane	ND	250	150	ug/l	
75-35-4	1,1-Dichloroethene	ND	250	150	ug/l	
156-59-2	cis-1,2-Dichloroethene	3020	250	130	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	250	130	ug/l	
78-87-5	1,2-Dichloropropane	ND	250	130	ug/l	
10061-01-5	cis-1,3-Dichloropropene [c]	ND	250	120	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	250	110	ug/l	
100-41-4	Ethylbenzene	ND	250	150	ug/l	
76-13-1	Freon 113	ND	1300	490	ug/l	
591-78-6	2-Hexanone	ND	1300	510	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-1	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	ND	250	160	ug/l	
79-20-9	Methyl Acetate	ND	1300	200	ug/l	
108-87-2	Methylcyclohexane	ND	1300	150	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	250	130	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK [b]	ND	1300	460	ug/l	
75-09-2	Methylene chloride	ND	500	250	ug/l	
100-42-5	Styrene	ND	250	170	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	160	ug/l	
127-18-4	Tetrachloroethene	187000 [d]	2500	2200	ug/l	
108-88-3	Toluene	ND	250	130	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	250	130	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	250	130	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	250	130	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	250	130	ug/l	
79-01-6	Trichloroethene	9430	250	130	ug/l	
75-69-4	Trichlorofluoromethane	ND	500	210	ug/l	
75-01-4	Vinyl chloride	ND	250	200	ug/l	
	m,p-Xylene	ND	250	200	ug/l	
95-47-6	o-Xylene	ND	250	150	ug/l	
1330-20-7	Xylene (total)	ND	250	150	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	95%	97%	80-120%
17060-07-0	1,2-Dichloroethane-D4	101%	102%	81-124%
2037-26-5	Toluene-D8	106%	103%	80-120%
460-00-4	4-Bromofluorobenzene	105%	107%	80-120%

(a) Diluted due to high concentration of target compound.
(b) Associated CCV outside of control limits high, sample was ND.
(c) Associated CCV and BS outside of control limits high, sample was ND.
(d) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-1
Matrix: AQ - Water
Method: SW846 8270D SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M155927.D	1	07/06/19 06:43	CS	07/05/19 09:30	OP21373	EM6658
Run #2							

	Initial Volume	Final Volume
Run #1	1020 ml	1.0 ml
Run #2		

ABN TCL List (SOM0 2.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	4.9	0.80	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	4.9	0.87	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.0	1.2	ug/l	
105-67-9	2,4-Dimethylphenol	ND	4.9	2.4	ug/l	
51-28-5	2,4-Dinitrophenol	ND	4.9	1.5	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	4.9	1.3	ug/l	
95-48-7	2-Methylphenol	ND	2.0	0.87	ug/l	
	3&4-Methylphenol	ND	2.0	0.86	ug/l	
88-75-5	2-Nitrophenol	ND	4.9	0.94	ug/l	
100-02-7	4-Nitrophenol	ND	9.8	1.1	ug/l	
87-86-5	Pentachlorophenol	ND	3.9	1.4	ug/l	
108-95-2	Phenol	0.52	2.0	0.38	ug/l	J
58-90-2	2,3,4,6-Tetrachlorophenol	ND	4.9	1.4	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	4.9	1.3	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	4.9	0.91	ug/l	
83-32-9	Acenaphthene	ND	0.98	0.19	ug/l	
208-96-8	Acenaphthylene	0.15	0.98	0.13	ug/l	J
98-86-2	Acetophenone	ND	2.0	0.20	ug/l	
120-12-7	Anthracene	0.41	0.98	0.21	ug/l	J
1912-24-9	Atrazine	1.4	2.0	0.44	ug/l	J
100-52-7	Benzaldehyde [a]	ND	4.9	0.28	ug/l	
56-55-3	Benzo(a)anthracene	0.49	0.98	0.20	ug/l	J
50-32-8	Benzo(a)pyrene	0.31	0.98	0.21	ug/l	J
205-99-2	Benzo(b)fluoranthene	0.35	0.98	0.20	ug/l	J
191-24-2	Benzo(g,h,i)perylene	ND	0.98	0.33	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.98	0.20	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.0	0.40	ug/l	
85-68-7	Butyl benzyl phthalate	8.8	2.0	0.45	ug/l	
92-52-4	1,1'-Biphenyl	0.23	0.98	0.21	ug/l	J
91-58-7	2-Chloronaphthalene	ND	2.0	0.23	ug/l	
106-47-8	4-Chloroaniline	ND	4.9	0.33	ug/l	
86-74-8	Carbazole	1.1	0.98	0.22	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-1
Matrix: AQ - Water
Method: SW846 8270D SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

ABN TCL List (SOM0 2.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	2.0	0.64	ug/l	
218-01-9	Chrysene	0.39	0.98	0.17	ug/l	J
111-91-1	bis(2-Chloroethoxy)methane	ND	2.0	0.27	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.0	0.24	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	ND	2.0	0.40	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.0	0.36	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.98	0.54	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.98	0.47	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.0	0.50	ug/l	
123-91-1	1,4-Dioxane	ND	0.98	0.64	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.98	0.32	ug/l	
132-64-9	Dibenzofuran	0.38	4.9	0.22	ug/l	J
84-74-2	Di-n-butyl phthalate	6.4	2.0	0.49	ug/l	
117-84-0	Di-n-octyl phthalate	ND	2.0	0.23	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.26	ug/l	
131-11-3	Dimethyl phthalate	ND	2.0	0.21	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	5.6	2.0	1.6	ug/l	
206-44-0	Fluoranthene	1.4	0.98	0.17	ug/l	
86-73-7	Fluorene	0.68	0.98	0.17	ug/l	J
118-74-1	Hexachlorobenzene	ND	0.98	0.32	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.98	0.48	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	9.8	2.7	ug/l	
67-72-1	Hexachloroethane	ND	2.0	0.38	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.98	0.33	ug/l	
78-59-1	Isophorone	ND	2.0	0.27	ug/l	
91-57-6	2-Methylnaphthalene	0.63	0.98	0.21	ug/l	J
88-74-4	2-Nitroaniline	ND	4.9	0.27	ug/l	
99-09-2	3-Nitroaniline	ND	4.9	0.38	ug/l	
100-01-6	4-Nitroaniline	ND	4.9	0.43	ug/l	
91-20-3	Naphthalene	3.4	0.98	0.23	ug/l	
98-95-3	Nitrobenzene	ND	2.0	0.63	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.0	0.47	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	4.9	0.22	ug/l	
85-01-8	Phenanthrene	2.3	0.98	0.17	ug/l	
129-00-0	Pyrene	1.0	0.98	0.21	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.0	0.36	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	36%		10-110%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-1	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

ABN TCL List (SOM0 2.0)

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	23%		10-110%
118-79-6	2,4,6-Tribromophenol	75%		36-151%
4165-60-0	Nitrobenzene-d5	71%		34-128%
321-60-8	2-Fluorobiphenyl	72%		38-119%
1718-51-0	Terphenyl-d14	60%		26-129%

(a) Associated CCV outside of control limits low. Low level standard analyzed to demonstrate system suitability to detect affected analytes.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-1	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8151A SW846 3510C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G123621.D	1	07/07/19 10:37	CB	07/04/19 08:00	OP21339	G3G4342
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	2.5 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D [a]	ND	0.42	0.11	ug/l	
93-72-1	2,4,5-TP (Silvex) [a]	ND	0.083	0.035	ug/l	
93-76-5	2,4,5-T	ND	0.083	0.029	ug/l	
75-99-0	Dalapon	ND	0.083	0.023	ug/l	
1918-00-9	Dicamba	ND	0.083	0.016	ug/l	
120-36-5	Dichloroprop	ND	0.42	0.20	ug/l	
88-85-7	Dinoseb [a]	ND	0.42	0.077	ug/l	
94-74-6	MCPA [b]	ND	42	10	ug/l	
93-65-2	MCPP [c]	ND	42	7.5	ug/l	
87-86-5	Pentachlorophenol [a]	ND	0.042	0.017	ug/l	
94-82-6	2,4-DB [a]	ND	0.42	0.14	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	102%		10-179%
19719-28-9	2,4-DCAA	90%		10-179%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits low. This compound outside control limits biased high in the associated BS.
(c) Associated CCV outside of control limits low.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-1
Matrix: AQ - Water
Method: SW846 8081B SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	6G66222.D	1	07/16/19 13:08	VDT	07/15/19 08:00	OP21503	G6G2066
Run #2 [b]	8G24460.D	1	07/04/19 03:41	CP	07/02/19 13:30	OP21316	G8G835

	Initial Volume	Final Volume
Run #1	300 ml	2.0 ml
Run #2	300 ml	2.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.0067	0.0034	ug/l	
319-84-6	alpha-BHC	ND	0.0067	0.0035	ug/l	
319-85-7	beta-BHC	ND	0.0067	0.0053	ug/l	
319-86-8	delta-BHC	ND	0.0067	0.0044	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.0067	0.0040	ug/l	
5103-71-9	alpha-Chlordane	ND	0.0067	0.0033	ug/l	
5103-74-2	gamma-Chlordane	ND	0.0067	0.0028	ug/l	
60-57-1	Dieldrin	ND	0.0067	0.0051	ug/l	
72-54-8	4,4'-DDD [c]	0.0081	0.0067	0.0038	ug/l	
72-55-9	4,4'-DDE	ND	0.0067	0.0034	ug/l	
50-29-3	4,4'-DDT	ND	0.0067	0.0046	ug/l	
72-20-8	Endrin	ND	0.0067	0.0040	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.0067	0.0036	ug/l	
7421-93-4	Endrin aldehyde	ND	0.0067	0.0045	ug/l	
53494-70-5	Endrin ketone	ND	0.0067	0.0041	ug/l	
959-98-8	Endosulfan-I	ND	0.0067	0.0035	ug/l	
33213-65-9	Endosulfan-II	ND	0.0067	0.0033	ug/l	
76-44-8	Heptachlor	ND	0.0067	0.0030	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.0067	0.0040	ug/l	
72-43-5	Methoxychlor	ND	0.013	0.0045	ug/l	
8001-35-2	Toxaphene	ND	0.17	0.11	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	79%	26%	13-153%
877-09-8	Tetrachloro-m-xylene	60%	27%	13-153%
2051-24-3	Decachlorobiphenyl	82%	10%	10-138%
2051-24-3	Decachlorobiphenyl	55%	9% [d]	10-138%

(a) Re-extracted due to MB outside in house QC limits. Originally prep date was within holding time.
(b) Confirmation run.
(c) More than 40 % RPD for detected concentrations between the two GC columns.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-1	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8081B SW846 3510C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q

(d) Outside control limits due to matrix interference.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-1	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8082A SW846 3510C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5G89537.D	1	07/03/19 10:19	CP	07/02/19 13:30	OP21315	G5G2165
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	2.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016 [a]	ND	0.33	0.13	ug/l	
11104-28-2	Aroclor 1221	ND	0.33	0.28	ug/l	
11141-16-5	Aroclor 1232	ND	0.33	0.17	ug/l	
53469-21-9	Aroclor 1242	ND	0.33	0.15	ug/l	
12672-29-6	Aroclor 1248	ND	0.33	0.084	ug/l	
11097-69-1	Aroclor 1254	ND	0.33	0.28	ug/l	
11096-82-5	Aroclor 1260 [a]	ND	0.33	0.10	ug/l	
11100-14-4	Aroclor 1268	ND	0.33	0.12	ug/l	
37324-23-5	Aroclor 1262	ND	0.33	0.13	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	42%		11-166%
877-09-8	Tetrachloro-m-xylene	41%		11-166%
2051-24-3	Decachlorobiphenyl	22%		10-150%
2051-24-3	Decachlorobiphenyl	17%		10-150%

(a) This compound outside control limits biased high in the associated BS.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-1
Matrix: AQ - Water
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	11.4	0.20	0.046	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Antimony	ND	0.0060	0.0047	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Arsenic [a]	0.0092	0.0060	0.0056	mg/l	2	07/05/19	07/11/19	ND	SW846 6010D [3]	SW846 3010A [5]
Barium	0.0771 J	0.20	0.013	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Beryllium	ND	0.0010	0.00050	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Cadmium	ND	0.0030	0.0010	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Calcium	106	5.0	0.099	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Chromium	0.0141	0.010	0.0020	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Cobalt	0.0096 J	0.050	0.0026	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Copper	0.0154	0.010	0.0059	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Iron	13.4	0.10	0.032	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Lead [a]	0.0240	0.0060	0.0036	mg/l	2	07/05/19	07/11/19	ND	SW846 6010D [3]	SW846 3010A [5]
Magnesium	51.6	5.0	0.14	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Manganese	0.308	0.015	0.0014	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Mercury	0.00020	0.00020	0.000095	mg/l	1	07/01/19	07/01/19	LL	SW846 7470A [1]	SW846 7470A [4]
Nickel	0.0251	0.010	0.0017	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Potassium	9.10 J	10	0.20	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Selenium	ND	0.010	0.0049	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Silver	ND	0.010	0.0019	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Sodium	28.6	10	0.57	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Thallium	ND	0.010	0.0018	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Vanadium	0.0231 J	0.050	0.0018	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Zinc	0.0440	0.020	0.0069	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]

(1) Instrument QC Batch: MA47014
(2) Instrument QC Batch: MA47077
(3) Instrument QC Batch: MA47083
(4) Prep QC Batch: MP16185
(5) Prep QC Batch: MP16258

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-1	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
		Percent Solids:	n/a
Project:	Pine Avenue, Niagara Falls, NY		

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Corrosivity as pH	6.93 NC			su	1	07/10/19 21:54	MS	SW846 9040C
Cyanide	ND	0.010	0.0041	mg/l	1	07/11/19 10:00	KI	EPA 335.4/LACHAT
Cyanide Reactivity	ND	10	10	mg/l	1	07/03/19 15:31	BM	SW846 CHAP7/9012B
Ignitability (Flashpoint)	> 200			Deg. F	1	07/14/19 14:30	JOO	SW846 1010A/ASTM D93
Sulfide Reactivity	ND	100	43	mg/l	1	07/03/19 15:49	MP	SW846 CHAP7/9034

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-2
Matrix: AQ - Water
Method: SW846 8260C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	2D184004.D	50	07/10/19 05:27	ED	n/a	n/a	V2D7886
Run #2	2D184005.D	500	07/10/19 05:57	ED	n/a	n/a	V2D7886

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	500	300	ug/l	
71-43-2	Benzene	ND	25	21	ug/l	
74-97-5	Bromochloromethane	ND	50	24	ug/l	
75-27-4	Bromodichloromethane [b]	ND	50	29	ug/l	
75-25-2	Bromoform	ND	50	32	ug/l	
74-83-9	Bromomethane	ND	100	82	ug/l	
78-93-3	2-Butanone (MEK)	ND	500	340	ug/l	
75-15-0	Carbon disulfide	ND	100	48	ug/l	
56-23-5	Carbon tetrachloride	ND	50	28	ug/l	
108-90-7	Chlorobenzene	ND	50	28	ug/l	
75-00-3	Chloroethane	ND	50	36	ug/l	
67-66-3	Chloroform	ND	50	25	ug/l	
74-87-3	Chloromethane	ND	50	38	ug/l	
110-82-7	Cyclohexane	ND	250	39	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	100	60	ug/l	
124-48-1	Dibromochloromethane	ND	50	28	ug/l	
106-93-4	1,2-Dibromoethane	ND	50	24	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	50	27	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	50	27	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	25	ug/l	
75-71-8	Dichlorodifluoromethane	ND	100	68	ug/l	
75-34-3	1,1-Dichloroethane	ND	50	28	ug/l	
107-06-2	1,2-Dichloroethane	ND	50	30	ug/l	
75-35-4	1,1-Dichloroethene	ND	50	30	ug/l	
156-59-2	cis-1,2-Dichloroethene	1600	50	25	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	50	27	ug/l	
78-87-5	1,2-Dichloropropane	ND	50	25	ug/l	
10061-01-5	cis-1,3-Dichloropropene [c]	ND	50	24	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	50	22	ug/l	
100-41-4	Ethylbenzene	ND	50	30	ug/l	
76-13-1	Freon 113	ND	250	97	ug/l	
591-78-6	2-Hexanone	ND	250	100	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-2	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	ND	50	32	ug/l	
79-20-9	Methyl Acetate	ND	250	40	ug/l	
108-87-2	Methylcyclohexane	ND	250	30	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	50	25	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK [b]	ND	250	93	ug/l	
75-09-2	Methylene chloride	ND	100	50	ug/l	
100-42-5	Styrene	ND	50	35	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	33	ug/l	
127-18-4	Tetrachloroethene	27300 [d]	500	450	ug/l	
108-88-3	Toluene	ND	50	27	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	50	25	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	50	25	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	50	27	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	50	27	ug/l	
79-01-6	Trichloroethene	3720	50	26	ug/l	
75-69-4	Trichlorofluoromethane	ND	100	42	ug/l	
75-01-4	Vinyl chloride	ND	50	39	ug/l	
	m,p-Xylene	ND	50	39	ug/l	
95-47-6	o-Xylene	ND	50	30	ug/l	
1330-20-7	Xylene (total)	ND	50	30	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	96%	97%	80-120%
17060-07-0	1,2-Dichloroethane-D4	103%	103%	81-124%
2037-26-5	Toluene-D8	104%	102%	80-120%
460-00-4	4-Bromofluorobenzene	106%	107%	80-120%

(a) Diluted due to high concentration of target compound.
(b) Associated CCV outside of control limits high, sample was ND.
(c) Associated CCV and BS outside of control limits high, sample was ND.
(d) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-2
Matrix: AQ - Water
Method: SW846 8270D SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M155928.D	1	07/06/19 07:12	CS	07/05/19 09:30	OP21373	EM6658
Run #2							

	Initial Volume	Final Volume
Run #1	1040 ml	1.0 ml
Run #2		

ABN TCL List (SOM0 2.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	4.8	0.79	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	4.8	0.86	ug/l	
120-83-2	2,4-Dichlorophenol	ND	1.9	1.2	ug/l	
105-67-9	2,4-Dimethylphenol	ND	4.8	2.3	ug/l	
51-28-5	2,4-Dinitrophenol	ND	4.8	1.5	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	4.8	1.2	ug/l	
95-48-7	2-Methylphenol	ND	1.9	0.85	ug/l	
	3&4-Methylphenol	ND	1.9	0.85	ug/l	
88-75-5	2-Nitrophenol	ND	4.8	0.92	ug/l	
100-02-7	4-Nitrophenol	ND	9.6	1.1	ug/l	
87-86-5	Pentachlorophenol	ND	3.8	1.3	ug/l	
108-95-2	Phenol	0.53	1.9	0.38	ug/l	J
58-90-2	2,3,4,6-Tetrachlorophenol	ND	4.8	1.4	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	4.8	1.3	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	4.8	0.89	ug/l	
83-32-9	Acenaphthene	ND	0.96	0.18	ug/l	
208-96-8	Acenaphthylene	ND	0.96	0.13	ug/l	
98-86-2	Acetophenone	ND	1.9	0.20	ug/l	
120-12-7	Anthracene	ND	0.96	0.20	ug/l	
1912-24-9	Atrazine	2.4	1.9	0.43	ug/l	
100-52-7	Benzaldehyde [a]	ND	4.8	0.28	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.96	0.20	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.96	0.20	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.96	0.20	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.96	0.33	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.96	0.20	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	1.9	0.39	ug/l	
85-68-7	Butyl benzyl phthalate	10.5	1.9	0.44	ug/l	
92-52-4	1,1'-Biphenyl	ND	0.96	0.20	ug/l	
91-58-7	2-Chloronaphthalene	ND	1.9	0.23	ug/l	
106-47-8	4-Chloroaniline	ND	4.8	0.33	ug/l	
86-74-8	Carbazole	0.46	0.96	0.22	ug/l	J

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-2
Matrix: AQ - Water
Method: SW846 8270D SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

ABN TCL List (SOM0 2.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	1.9	0.62	ug/l	
218-01-9	Chrysene	ND	0.96	0.17	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	1.9	0.27	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	1.9	0.24	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	ND	1.9	0.39	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	1.9	0.35	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.96	0.53	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.96	0.46	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	1.9	0.49	ug/l	
123-91-1	1,4-Dioxane	ND	0.96	0.63	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.96	0.32	ug/l	
132-64-9	Dibenzofuran	0.21	4.8	0.21	ug/l	J
84-74-2	Di-n-butyl phthalate	6.5	1.9	0.48	ug/l	
117-84-0	Di-n-octyl phthalate	ND	1.9	0.22	ug/l	
84-66-2	Diethyl phthalate	ND	1.9	0.25	ug/l	
131-11-3	Dimethyl phthalate	ND	1.9	0.21	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	1.9	1.6	ug/l	
206-44-0	Fluoranthene	0.19	0.96	0.16	ug/l	J
86-73-7	Fluorene	0.45	0.96	0.16	ug/l	J
118-74-1	Hexachlorobenzene	ND	0.96	0.31	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.96	0.47	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	9.6	2.7	ug/l	
67-72-1	Hexachloroethane	ND	1.9	0.37	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.96	0.32	ug/l	
78-59-1	Isophorone	ND	1.9	0.27	ug/l	
91-57-6	2-Methylnaphthalene	0.23	0.96	0.20	ug/l	J
88-74-4	2-Nitroaniline	ND	4.8	0.27	ug/l	
99-09-2	3-Nitroaniline	ND	4.8	0.37	ug/l	
100-01-6	4-Nitroaniline	ND	4.8	0.42	ug/l	
91-20-3	Naphthalene	0.91	0.96	0.22	ug/l	J
98-95-3	Nitrobenzene	ND	1.9	0.62	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	1.9	0.46	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	4.8	0.21	ug/l	
85-01-8	Phenanthrene	1.4	0.96	0.17	ug/l	
129-00-0	Pyrene	ND	0.96	0.21	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	1.9	0.36	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	32%		10-110%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-2	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

ABN TCL List (SOM0 2.0)

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	23%		10-110%
118-79-6	2,4,6-Tribromophenol	87%		36-151%
4165-60-0	Nitrobenzene-d5	70%		34-128%
321-60-8	2-Fluorobiphenyl	66%		38-119%
1718-51-0	Terphenyl-d14	47%		26-129%

(a) Associated CCV outside of control limits low. Low level standard analyzed to demonstrate system suitability to detect affected analytes.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-2	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8151A SW846 3510C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G123622.D	1	07/07/19 11:06	CB	07/04/19 08:00	OP21339	G3G4342
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	2.5 ml
Run #2		

Herbicide List

CAS No.	Compound	Result	RL	MDL	Units	Q
94-75-7	2,4-D [a]	ND	0.42	0.11	ug/l	
93-72-1	2,4,5-TP (Silvex) [a]	ND	0.083	0.035	ug/l	
93-76-5	2,4,5-T	ND	0.083	0.029	ug/l	
75-99-0	Dalapon	ND	0.083	0.023	ug/l	
1918-00-9	Dicamba	ND	0.083	0.016	ug/l	
120-36-5	Dichloroprop	ND	0.42	0.20	ug/l	
88-85-7	Dinoseb [a]	ND	0.42	0.077	ug/l	
94-74-6	MCPA [b]	ND	42	10	ug/l	
93-65-2	MCPP [c]	ND	42	7.5	ug/l	
87-86-5	Pentachlorophenol [d]	0.068	0.042	0.017	ug/l	
94-82-6	2,4-DB [a]	ND	0.42	0.14	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	90%		10-179%
19719-28-9	2,4-DCAA	88%		10-179%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits low. This compound outside control limits biased high in the associated BS.
(c) Associated CCV outside of control limits low.
(d) Reported from the 2nd signal. The %D of the CCV on the 1st signal exceeds the method criteria of 20%, so it being used for confirmation only.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-2
Matrix: AQ - Water
Method: SW846 8081B SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	6G66223.D	1	07/16/19 13:25	VDT	07/15/19 08:00	OP21503	G6G2066
Run #2 [b]	8G24461.D	1	07/04/19 03:58	CP	07/02/19 13:30	OP21316	G8G835

	Initial Volume	Final Volume
Run #1	300 ml	2.0 ml
Run #2	300 ml	2.0 ml

Pesticide TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
309-00-2	Aldrin	ND	0.0067	0.0034	ug/l	
319-84-6	alpha-BHC	ND	0.0067	0.0035	ug/l	
319-85-7	beta-BHC	ND	0.0067	0.0053	ug/l	
319-86-8	delta-BHC	ND	0.0067	0.0044	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.0067	0.0040	ug/l	
5103-71-9	alpha-Chlordane	ND	0.0067	0.0033	ug/l	
5103-74-2	gamma-Chlordane	ND	0.0067	0.0028	ug/l	
60-57-1	Dieldrin	0.0057	0.0067	0.0051	ug/l	J
72-54-8	4,4'-DDD [c]	0.0054	0.0067	0.0038	ug/l	J
72-55-9	4,4'-DDE	ND	0.0067	0.0034	ug/l	
50-29-3	4,4'-DDT	ND	0.0067	0.0046	ug/l	
72-20-8	Endrin	ND	0.0067	0.0040	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.0067	0.0036	ug/l	
7421-93-4	Endrin aldehyde	ND	0.0067	0.0045	ug/l	
53494-70-5	Endrin ketone	ND	0.0067	0.0041	ug/l	
959-98-8	Endosulfan-I	ND	0.0067	0.0035	ug/l	
33213-65-9	Endosulfan-II	ND	0.0067	0.0033	ug/l	
76-44-8	Heptachlor	ND	0.0067	0.0030	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.0067	0.0040	ug/l	
72-43-5	Methoxychlor	ND	0.013	0.0045	ug/l	
8001-35-2	Toxaphene	ND	0.17	0.11	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	80%	62%	13-153%
877-09-8	Tetrachloro-m-xylene	60%	50%	13-153%
2051-24-3	Decachlorobiphenyl	78%	19%	10-138%
2051-24-3	Decachlorobiphenyl	53%	14%	10-138%

(a) Re-extracted due to MB outside in house QC limits. Originally prep date was within holding time.
(b) Confirmation run.
(c) More than 40 % RPD for detected concentrations between the two GC columns.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-2	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
Method:	SW846 8082A SW846 3510C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5G89538.D	1	07/03/19 10:53	CP	07/02/19 13:30	OP21315	G5G2165
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	2.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016 [a]	ND	0.33	0.13	ug/l	
11104-28-2	Aroclor 1221	ND	0.33	0.28	ug/l	
11141-16-5	Aroclor 1232	ND	0.33	0.17	ug/l	
53469-21-9	Aroclor 1242	ND	0.33	0.15	ug/l	
12672-29-6	Aroclor 1248	ND	0.33	0.084	ug/l	
11097-69-1	Aroclor 1254	ND	0.33	0.28	ug/l	
11096-82-5	Aroclor 1260 [a]	ND	0.33	0.10	ug/l	
11100-14-4	Aroclor 1268	ND	0.33	0.12	ug/l	
37324-23-5	Aroclor 1262	ND	0.33	0.13	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	63%		11-166%
877-09-8	Tetrachloro-m-xylene	68%		11-166%
2051-24-3	Decachlorobiphenyl	28%		10-150%
2051-24-3	Decachlorobiphenyl	22%		10-150%

(a) This compound outside control limits biased high in the associated BS.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW-WATER_06/28/19
Lab Sample ID: JC90936-2
Matrix: AQ - Water
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum	41.1	0.20	0.046	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Antimony	ND	0.0060	0.0047	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Arsenic [a]	0.0218	0.0090	0.0084	mg/l	3	07/05/19	07/11/19	ND	SW846 6010D [3]	SW846 3010A [5]
Barium	0.242	0.20	0.013	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Beryllium	0.0016	0.0010	0.00050	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Cadmium	ND	0.0030	0.0010	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Calcium	182	5.0	0.099	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Chromium	0.0556	0.010	0.0020	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Cobalt	0.0536	0.050	0.0026	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Copper	0.0591	0.010	0.0059	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Iron	58.9	0.10	0.032	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Lead [a]	0.0249	0.0090	0.0054	mg/l	3	07/05/19	07/11/19	ND	SW846 6010D [3]	SW846 3010A [5]
Magnesium	65.3	5.0	0.14	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Manganese	1.33	0.015	0.0014	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Mercury	0.00017 J	0.00020	0.000095	mg/l	1	07/01/19	07/01/19	LL	SW846 7470A [1]	SW846 7470A [4]
Nickel	0.0779	0.010	0.0017	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Potassium	16.4	10	0.20	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Selenium	ND	0.010	0.0049	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Silver	0.0021 J	0.010	0.0019	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Sodium	40.8	10	0.57	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Thallium	0.0022 J	0.010	0.0018	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Vanadium	0.0794	0.050	0.0018	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]
Zinc	0.215	0.020	0.0069	mg/l	1	07/05/19	07/11/19	ND	SW846 6010D [2]	SW846 3010A [5]

(1) Instrument QC Batch: MA47014
(2) Instrument QC Batch: MA47077
(3) Instrument QC Batch: MA47083
(4) Prep QC Batch: MP16185
(5) Prep QC Batch: MP16258

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	IDW-WATER_06/28/19		
Lab Sample ID:	JC90936-2	**Date Sampled:**	06/28/19
Matrix:	AQ - Water	**Date Received:**	06/29/19
		Percent Solids:	n/a
Project:	Pine Avenue, Niagara Falls, NY		

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Corrosivity as pH	7.62 NC			su	1	07/10/19 21:55	MS	SW846 9040C
Cyanide	ND	0.010	0.0041	mg/l	1	07/11/19 10:01	KI	EPA 335.4/LACHAT
Cyanide Reactivity	ND	10	10	mg/l	1	07/03/19 15:32	BM	SW846 CHAP7/9012B
Ignitability (Flashpoint)	> 200			Deg. F	1	07/14/19 14:30	JOO	SW846 1010A/ASTM D93
Sulfide Reactivity	ND	100	43	mg/l	1	07/03/19 15:49	MP	SW846 CHAP7/9034

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID: IDW_SOLID_062819
Lab Sample ID: JC90936-3
Matrix: SO - Soil
Method: SW846 8260C SW846 1311
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: 83.6

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2V59500.D	5	07/02/19 16:46	EH	06/29/19 19:45	GP22087	V2V2442
Run #2 [a]	2V59524.D	50	07/03/19 13:12	EH	06/29/19 19:45	GP22087	V2V2443

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
71-43-2	Benzene	ND	D018	0.50	0.0025	0.0021	mg/l	
78-93-3	2-Butanone (MEK)	ND	D035	200	0.10	0.034	mg/l	
56-23-5	Carbon tetrachloride	ND	D019	0.50	0.0050	0.0028	mg/l	
108-90-7	Chlorobenzene	ND	D021	100	0.0050	0.0028	mg/l	
67-66-3	Chloroform	ND	D022	6.0	0.0050	0.0025	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.0050	0.0025	mg/l	
107-06-2	1,2-Dichloroethane	ND	D028	0.50	0.0050	0.0030	mg/l	
75-35-4	1,1-Dichloroethene	ND	D029	0.70	0.0050	0.0030	mg/l	
127-18-4	Tetrachloroethene	1.68 [b]	D039	0.70	0.050	0.045	mg/l	
79-01-6	Trichloroethene	0.0460	D040	0.50	0.0050	0.0026	mg/l	
75-01-4	Vinyl chloride	ND	D043	0.20	0.0050	0.0039	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	92%	91%	76-120%
17060-07-0	1,2-Dichloroethane-D4	91%	93%	64-135%
2037-26-5	Toluene-D8	92%	92%	76-117%
460-00-4	4-Bromofluorobenzene	99%	98%	72-122%

(a) Diluted due to high concentration of target compound.
(b) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW_SOLID_062819
Lab Sample ID: JC90936-3
Matrix: SO - Soil
Method: SW846 8270D SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: 83.6

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F186009.D	1	07/18/19 04:06	CS	07/17/19 09:00	OP21540	EF8001
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	1.0 ml
Run #2		

ABN TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	D023	200	0.020	0.0089	mg/l	
	3&4-Methylphenol	ND	D024	200	0.020	0.0088	mg/l	
87-86-5	Pentachlorophenol	ND	D037	100	0.10	0.014	mg/l	
95-95-4	2,4,5-Trichlorophenol	ND	D041	400	0.050	0.013	mg/l	
88-06-2	2,4,6-Trichlorophenol	ND	D042	2.0	0.050	0.0092	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.020	0.0017	mg/l	
121-14-2	2,4-Dinitrotoluene	ND	D030	0.13	0.020	0.0055	mg/l	
118-74-1	Hexachlorobenzene	ND	D032	0.13	0.020	0.0033	mg/l	
87-68-3	Hexachlorobutadiene	ND	D033	0.50	0.010	0.0049	mg/l	
67-72-1	Hexachloroethane	ND	D034	3.0	0.050	0.0039	mg/l	
98-95-3	Nitrobenzene	ND	D036	2.0	0.020	0.0064	mg/l	
110-86-1	Pyridine	ND	D038	5.0	0.020	0.0039	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	45%		14-88%
4165-62-2	Phenol-d5	31%		10-110%
118-79-6	2,4,6-Tribromophenol	90%		39-149%
4165-60-0	Nitrobenzene-d5	88%		32-128%
321-60-8	2-Fluorobiphenyl	73%		35-119%
1718-51-0	Terphenyl-d14	86%		10-126%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW_SOLID_062819		
Lab Sample ID:	JC90936-3	**Date Sampled:**	06/28/19
Matrix:	SO - Soil	**Date Received:**	06/29/19
Method:	SW846 8151A SW846 3510C	**Percent Solids:**	83.6
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G123745.D	1	07/19/19 09:52	VDT	07/17/19 07:00	OP21562	G3G4352
Run #2							

	Initial Volume	Final Volume
Run #1	30.0 ml	2.5 ml
Run #2		

Herbicide TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
94-75-7	2,4-D [a]	ND	D016	10	0.0042	0.0012	mg/l	
93-72-1	2,4,5-TP (Silvex) [a]	ND	D017	1.0	0.0012	0.00025	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	83%		13-169%
19719-28-9	2,4-DCAA	68%		13-169%

(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW_SOLID_062819
Lab Sample ID: JC90936-3
Matrix: SO - Soil
Method: SW846 8081B SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: 83.6

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	8G24742.D	1	07/18/19 13:54	RK	07/17/19 10:00	OP21566	G8G846
Run #2							

	Initial Volume	Final Volume
Run #1	30.0 ml	2.0 ml
Run #2		

Pesticide TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND	D013	0.40	0.000067	0.000040	mg/l	
12789-03-6	Chlordane	ND	D020	0.030	0.0033	0.0014	mg/l	
72-20-8	Endrin	ND	D012	0.020	0.000067	0.000040	mg/l	
76-44-8	Heptachlor	ND	D031	0.0080	0.000067	0.000030	mg/l	
1024-57-3	Heptachlor epoxide	ND	D031	0.0080	0.000067	0.000040	mg/l	
72-43-5	Methoxychlor	ND	D014	10	0.00013	0.000045	mg/l	
8001-35-2	Toxaphene	ND	D015	0.50	0.0017	0.0011	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	61%		30-137%
877-09-8	Tetrachloro-m-xylene	61%		30-137%
2051-24-3	Decachlorobiphenyl	80%		10-137%
2051-24-3	Decachlorobiphenyl	77%		10-137%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW_SOLID_062819
Lab Sample ID: JC90936-3
Matrix: SO - Soil
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: 83.6

Metals Analysis, TCLP Leachate SW846 1311

Analyte	Result	HW#	MCL	RL	MDL	Units	DF	Prep	Analyzed	By	Method
Arsenic	ND	D004	5.0	0.50	0.014	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Barium	1.0	D005	100	1.0	0.067	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Cadmium	ND	D006	1.0	0.020	0.0050	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Chromium	ND	D007	5.0	0.050	0.010	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Lead	ND	D008	5.0	0.50	0.0090	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Mercury	ND	D009	0.20	0.00020	0.000095	mg/l	1	07/12/19	07/12/19	LL	SW846 7470A [1]
Selenium	ND	D010	1.0	0.50	0.025	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Silver	0.011 J	D011	5.0	0.050	0.0095	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]

(1) Instrument QC Batch: MA47085
(2) Instrument QC Batch: MA47089
(3) Prep QC Batch: MP16354
(4) Prep QC Batch: MP16367

RL = Reporting Limit MDL = Method Detection Limit ND = Not detected
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	IDW_SOLID_062819		
Lab Sample ID:	JC90936-3	**Date Sampled:**	06/28/19
Matrix:	SO - Soil	**Date Received:**	06/29/19
		Percent Solids:	83.6
Project:	Pine Avenue, Niagara Falls, NY		

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Corrosivity as pH	9.08 NC			su	1	07/11/19 13:29	MS	SW846 9045D
Cyanide Reactivity	ND	12	9.2	mg/kg	1	07/12/19 16:21	KI	SW846 CHAP7/9012 B
Ignitability (Flashpoint)	> 200			Deg. F	1	07/14/19 15:30	JOO	SW846 1010A/ASTM D93
Solids, Percent	83.6			%	1	07/10/19 15:30	BG	SM2540 G 18TH ED MOD
Sulfide Reactivity	ND	120	73	mg/kg	1	07/12/19 16:16	CM	SW846 CHAP7/9034

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID: IDW_SOLID_062819
Lab Sample ID: JC90936-4
Matrix: SO - Soil
Method: SW846 8260C SW846 1311
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: 82.1

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2V59534.D	5	07/03/19 17:35	EH	06/29/19 19:45	GP22087	V2V2443
Run #2	2V59535.D	50	07/03/19 18:02	EH	06/29/19 19:45	GP22087	V2V2443

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
71-43-2	Benzene	ND	D018	0.50	0.0025	0.0021	mg/l	
78-93-3	2-Butanone (MEK)	ND	D035	200	0.10	0.034	mg/l	
56-23-5	Carbon tetrachloride	ND	D019	0.50	0.0050	0.0028	mg/l	
108-90-7	Chlorobenzene	ND	D021	100	0.0050	0.0028	mg/l	
67-66-3	Chloroform	ND	D022	6.0	0.0050	0.0025	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.0050	0.0025	mg/l	
107-06-2	1,2-Dichloroethane	ND	D028	0.50	0.0050	0.0030	mg/l	
75-35-4	1,1-Dichloroethene	ND	D029	0.70	0.0050	0.0030	mg/l	
127-18-4	Tetrachloroethene	3.67 [a]	D039	0.70	0.050	0.045	mg/l	
79-01-6	Trichloroethene	0.144	D040	0.50	0.0050	0.0026	mg/l	
75-01-4	Vinyl chloride	ND	D043	0.20	0.0050	0.0039	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	91%	92%	76-120%
17060-07-0	1,2-Dichloroethane-D4	92%	95%	64-135%
2037-26-5	Toluene-D8	89%	92%	76-117%
460-00-4	4-Bromofluorobenzene	97%	96%	72-122%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW_SOLID_062819		
Lab Sample ID:	JC90936-4	**Date Sampled:**	06/28/19
Matrix:	SO - Soil	**Date Received:**	06/29/19
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	82.1
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	F186010.D	1	07/18/19 04:33	CS	07/17/19 09:00	OP21540	EF8001
Run #2							

	Initial Volume	Final Volume
Run #1	100 ml	1.0 ml
Run #2		

ABN TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
95-48-7	2-Methylphenol	ND	D023	200	0.020	0.0089	mg/l	
	3&4-Methylphenol	ND	D024	200	0.020	0.0088	mg/l	
87-86-5	Pentachlorophenol	ND	D037	100	0.10	0.014	mg/l	
95-95-4	2,4,5-Trichlorophenol	ND	D041	400	0.050	0.013	mg/l	
88-06-2	2,4,6-Trichlorophenol	ND	D042	2.0	0.050	0.0092	mg/l	
106-46-7	1,4-Dichlorobenzene	ND	D027	7.5	0.020	0.0017	mg/l	
121-14-2	2,4-Dinitrotoluene	ND	D030	0.13	0.020	0.0055	mg/l	
118-74-1	Hexachlorobenzene	ND	D032	0.13	0.020	0.0033	mg/l	
87-68-3	Hexachlorobutadiene	ND	D033	0.50	0.010	0.0049	mg/l	
67-72-1	Hexachloroethane	ND	D034	3.0	0.050	0.0039	mg/l	
98-95-3	Nitrobenzene	ND	D036	2.0	0.020	0.0064	mg/l	
110-86-1	Pyridine	ND	D038	5.0	0.020	0.0039	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	42%		14-88%
4165-62-2	Phenol-d5	29%		10-110%
118-79-6	2,4,6-Tribromophenol	83%		39-149%
4165-60-0	Nitrobenzene-d5	85%		32-128%
321-60-8	2-Fluorobiphenyl	66%		35-119%
1718-51-0	Terphenyl-d14	79%		10-126%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	IDW_SOLID_062819		
Lab Sample ID:	JC90936-4	**Date Sampled:**	06/28/19
Matrix:	SO - Soil	**Date Received:**	06/29/19
Method:	SW846 8151A SW846 3510C	**Percent Solids:**	82.1
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G123746.D	1	07/19/19 10:24	VDT	07/17/19 07:00	OP21562	G3G4352
Run #2							

	Initial Volume	Final Volume
Run #1	30.0 ml	2.5 ml
Run #2		

Herbicide TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
94-75-7	2,4-D [a]	ND	D016	10	0.0042	0.0012	mg/l	
93-72-1	2,4,5-TP (Silvex) [a]	ND	D017	1.0	0.0012	0.00025	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
19719-28-9	2,4-DCAA	100%		13-169%
19719-28-9	2,4-DCAA	85%		13-169%

(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW_SOLID_062819
Lab Sample ID: JC90936-4
Matrix: SO - Soil
Method: SW846 8081B SW846 3510C
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: 82.1

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	8G24743.D	1	07/18/19 14:11	RK	07/17/19 10:00	OP21566	G8G846
Run #2							

	Initial Volume	Final Volume
Run #1	30.0 ml	2.0 ml
Run #2		

Pesticide TCLP Leachate **TCLP Leachate method SW846 1311**

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
58-89-9	gamma-BHC (Lindane)	ND	D013	0.40	0.000067	0.000040	mg/l	
12789-03-6	Chlordane	ND	D020	0.030	0.0033	0.0014	mg/l	
72-20-8	Endrin	ND	D012	0.020	0.000067	0.000040	mg/l	
76-44-8	Heptachlor	ND	D031	0.0080	0.000067	0.000030	mg/l	
1024-57-3	Heptachlor epoxide	ND	D031	0.0080	0.000067	0.000040	mg/l	
72-43-5	Methoxychlor	ND	D014	10	0.00013	0.000045	mg/l	
8001-35-2	Toxaphene	ND	D015	0.50	0.0017	0.0011	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	89%		30-137%
877-09-8	Tetrachloro-m-xylene	88%		30-137%
2051-24-3	Decachlorobiphenyl	96%		10-137%
2051-24-3	Decachlorobiphenyl	96%		10-137%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: IDW_SOLID_062819
Lab Sample ID: JC90936-4
Matrix: SO - Soil
Project: Pine Avenue, Niagara Falls, NY

Date Sampled: 06/28/19
Date Received: 06/29/19
Percent Solids: 82.1

Metals Analysis, TCLP Leachate SW846 1311

Analyte	Result	HW#	MCL	RL	MDL	Units	DF	Prep	Analyzed	By	Method
Arsenic	ND	D004	5.0	0.50	0.014	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Barium	1.0	D005	100	1.0	0.067	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Cadmium	ND	D006	1.0	0.020	0.0050	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Chromium	ND	D007	5.0	0.050	0.010	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Lead	0.013 J	D008	5.0	0.50	0.0090	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Mercury	ND	D009	0.20	0.00020	0.000095	mg/l	1	07/12/19	07/12/19	LL	SW846 7470A [1]
Selenium	ND	D010	1.0	0.50	0.025	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]
Silver	0.011 J	D011	5.0	0.050	0.0095	mg/l	5	07/11/19	07/13/19	ND	SW846 6010D [2]

(1) Instrument QC Batch: MA47085
(2) Instrument QC Batch: MA47089
(3) Prep QC Batch: MP16354
(4) Prep QC Batch: MP16367

RL = Reporting Limit MDL = Method Detection Limit ND = Not detected
MCL = Maximum Contamination Level (40 CFR 261 7/1/11) J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	IDW_SOLID_062819		
Lab Sample ID:	JC90936-4	**Date Sampled:**	06/28/19
Matrix:	SO - Soil	**Date Received:**	06/29/19
		Percent Solids:	82.1
Project:	Pine Avenue, Niagara Falls, NY		

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Corrosivity as pH	9.07 NC			su	1	07/11/19 13:30	MS	SW846 9045D
Cyanide Reactivity	ND	12	9.2	mg/kg	1	07/12/19 16:22	KI	SW846 CHAP7/9012 B
Ignitability (Flashpoint)	> 200			Deg. F	1	07/14/19 15:30	JOO	SW846 1010A/ASTM D93
Solids, Percent	82.1			%	1	07/10/19 15:30	BG	SM2540 G 18TH ED MOD
Sulfide Reactivity	ND	120	73	mg/kg	1	07/12/19 16:16	CM	SW846 CHAP7/9034

RL = Reporting Limit
MDL = Method Detection Limit
ND = Not detected
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	TRIP BLANK		
Lab Sample ID:	JC90936-5	**Date Sampled:**	06/28/19
Matrix:	AQ - Trip Blank Water	**Date Received:**	06/29/19
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D184006.D	1	07/10/19 06:27	ED	n/a	n/a	V2D7886
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	6.0	ug/l	
71-43-2	Benzene	ND	0.50	0.43	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.48	ug/l	
75-27-4	Bromodichloromethane [a]	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.63	ug/l	
74-83-9	Bromomethane	ND	2.0	1.6	ug/l	
78-93-3	2-Butanone (MEK)	ND	10	6.9	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.95	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.55	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.56	ug/l	
75-00-3	Chloroethane	ND	1.0	0.73	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	1.0	0.76	ug/l	
110-82-7	Cyclohexane	ND	5.0	0.78	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.0	1.2	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.56	ug/l	
106-93-4	1,2-Dibromoethane	ND	1.0	0.48	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.53	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.54	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.51	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.4	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.57	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.60	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.59	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.51	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.51	ug/l	
10061-01-5	cis-1,3-Dichloropropene [b]	ND	1.0	0.47	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.43	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.60	ug/l	
76-13-1	Freon 113	ND	5.0	1.9	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TRIP BLANK		
Lab Sample ID:	JC90936-5	**Date Sampled:**	06/28/19
Matrix:	AQ - Trip Blank Water	**Date Received:**	06/29/19
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Pine Avenue, Niagara Falls, NY		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
98-82-8	Isopropylbenzene	ND	1.0	0.65	ug/l	
79-20-9	Methyl Acetate	ND	5.0	0.80	ug/l	
108-87-2	Methylcyclohexane	ND	5.0	0.60	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.51	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK [a]	ND	5.0	1.9	ug/l	
75-09-2	Methylene chloride	ND	2.0	1.0	ug/l	
100-42-5	Styrene	ND	1.0	0.70	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.65	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.90	ug/l	
108-88-3	Toluene	ND	1.0	0.53	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	0.50	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.54	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.53	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.53	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.84	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.79	ug/l	
	m,p-Xylene	ND	1.0	0.78	ug/l	
95-47-6	o-Xylene	ND	1.0	0.59	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.59	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%		80-120%
17060-07-0	1,2-Dichloroethane-D4	103%		81-124%
2037-26-5	Toluene-D8	102%		80-120%
460-00-4	4-Bromofluorobenzene	109%		80-120%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV and BS outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

WW 50

JC90936

E

Waste Characterization Sampling

CHAIN-OF-CUSTODY / Analytical Request Document

Section A Laboratory Information	Section B Client Information	COC #:	Pine Ave-
Lab Name: SGS - Accutest	Company: Parsons	Project Name:	NYSDEC Standby Contract
Attention: Kristin DeGraw	Attention: Sara Weishaupt	Project Site:	Pine Ave, Niagara Falls NY
Address: Route 2235 Route 130; Dayton, NJ 08810	Address: 301 Plainfield Road,-Suite 350 Syracuse, NY 13212	Project Number:	448433.03
Phone: 732-329-0200	Phone: 315-552-9681		
Email:	Email: Sara.Weishaupt@parsons.com		

Section C Deliverable Requirements	Purchase Order No: 448433.03000
Report To: Sara.Weishaupt@parsons.com	TAT - 10 Day
Copy To: Lorraine.Weber@parsons.com; Heather.Fettig@parsons.com Maryanne.Kosciewicz@parsons.com	**Section D Additional Information**
Deliverables: Level 2, NYSDEC EQUIS EDD	

Preservative codes (for water only): Liquid Sample / Solid Sample

	Location ID	Start Depth (ft)	End Depth (ft)	Field Sample ID MUST BE UNIQUE	Sample Date	Sample Time	Sample Purpose	Sample Matrix	Sample Type	# of Cont.	MS/MSD	Composite (Y/N)	Total TCL VOCs - 8260	Total TCL SVOCs - 8270	Total TCL Pest/Herb - 8081/8151	Total TCL PCBs - 8082	TAL Metals/Hg - 6010B/7470A	Total CN	pH - 9040/SM4500-H+B	Flashpoint - 1010	Reactive CN/Reactive Sulfide	TCLP VOCs, TCLP SVOCs	TCLP Pest, TCLP Herb	TCLP Metals/Hg	Reactive CN, Reactive Sulfide	Corrosivity, Ignitability
											#Bottles																
1	IDW-Water-6/28/19	0	6.5	Pine Ave-010-01	6/28/19	1015	WC	WW	N	14			X	X	X	X	X	X	X	X	X						
2	IDW-Water-6/28/19	0	6.5	Pine Ave-010-02	6/28/19	1030	WC	WW	N	14			X	X	X	X	X	X	X	X	X						
3	IDW-Solid-6/28/19	0	6.5	Pine Ave-010-03	6/28/19	1130	WC	SO	N	4												X	X	X	X	X	•
4	IDW-Solid-6/28/19	0	6.5	Pine Ave-010-04	6/28/19	1145	WC	SO	N	4												X	X	X	X	X	•
5	Trip Blanks *				6/21/19	0700				2																	
6																											
7																											
8																											
9																											
10																											

Special Instructions:

* Added to COC DI 6/25/19
• Rec'd 2x25g encores DI 6/28/19

ALL SAMPLES RECEIVED PRESERVED AS APPLICABLE

INITIAL ASESSMENT 4B

LABEL VERIFICATION

Samplers Name:	Company: Parsons	Relinquished By:	Company:	Cooler Temp.:	Custody Seals Intact: Yes ☐ No ☐
Alex Cook	Date/Time: 6/28/19 1400		Date/Time:	Rec'd on Ice: Yes ☐ No ☐	Samples Intact: Yes ☐ No ☐
Shipment Method:	Shipment Tracking No:	Accepted By: FEDEX	Company:	Cooler Temp.:	Custody Seals Intact: Yes ☑ No ☐
	Date/Time:		Date/Time:	Rec'd on Ice: Yes ☑ No ☐	Samples Intact: Yes ☐ No ☐

Preservatives: 0 = None; [1 = HCL]; [2 = HNO3]; [3 = H2SO4]; [4 = NaOH]; [5 = Zn Acetate]; [6 = MeOH]; [7 = NaHSO4]; 8 = Other (H3PO4):

Relinquished by: FEDEX 6/29/19 0940

Rec'd by:

FEDEX 1019 2801 7940
1019 2801 7930

3.0°C IP IR278
3.9°C IP
TR278

C:\Users\p006976d\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\IHYL7PGO\Pine Ave COC for Waste.xlsx

FZ8 GZ AS 67 V37 D28 HSTZ

SGS Sample Receipt Summary

Job Number: JC90936 **Client:** **Project:**

Date / Time Received: 6/29/2019 9:40:00 AM **Delivery Method:** **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (3.6); Cooler 2: (3.9);

Cooler Temps (Corrected) °C: Cooler 1: (3.2); Cooler 2: (3.5);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	2		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☑		☐	☐
2. Trip Blank listed on COC:	☑		☐	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☑		☐	☐

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Test Strip Lot #s: pH 1-12: 229517 pH 12+: 208717 Other: (Specify)

Comments

SM089-03
Rev. Date 12/7/17

JC90936: Chain of Custody
Page 2 of 2

APPENDIX E-1 SVE SYSTEM INSTALLATION WASTE MANIFESTS

Please print or type.

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	NYCESQC	1	(877) 318-0087	001563242 VES

GENERATOR

5. Generator's Name and Mailing Address
NYSDEC CENTRAL OFFICE
270 MICHIGAN AVENUE
BUFFALO, NY 14203
Generator's Phone: 716 851-7220

Generator's Site Address (if different than mailing address)
2526 PINE AVENUE
NIAGARA FALLS, NY 14301

6. Transporter 1 Company Name
VEOLIA ES TECHNICAL SOLUTIONS
U.S. EPA ID Number: NJD080631369

7. Transporter 2 Company Name
FREEHOLD CARTAGE INC
U.S. EPA ID Number: NJD054176164

8. Designated Facility Name and Site Address
US ECOLOGY WAYNE DISPOSAL
49350 N I-94 SERVICE DRIVE
BELLEVILLE, MI 48111
Facility's Phone: 800 592-5489
U.S. EPA ID Number: MID048090633

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. NA3077, HAZARDOUS WASTE, SOLID, N.O.S., (GRAVEL, DIRT), 9, III	5	DM	3000	P	F001	L	
						D039		
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
All Services Contracted by YSDEC - Contract initiated by generator
confers agency authority on initial transporter to add or substitute additional transporters on generator's behalf 1) ERG
171 W 612422 A 1900307WDI

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: K Major Cichi
Signature: as agent for NYSDEC
Month: 09 Day: 19 Year: 19

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: THOMAS GILBERT
Signature:
Month: 09 Day: 19 Year: 19

Transporter 2 Printed/Typed Name:
Signature:
Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name:
Signature:
Month: Day: Year:

US ecology

Profile Tracking # _____

WASTE PROFILE FORM

For assistance in completing this document or for additional information on service offerings, please visit our website at www.usecology.com, or call 800-592-5489.

US Ecology will choose the appropriate facility and method of waste management for your waste from the technologies offered at each operation.

If you wish to direct this waste to a specific facility(s) or treatment technology please indicate here:

Waste Common Name: Solvents

Section 1 – Generator & Customer Information

Generator EPA ID # NYD012966156
NAICS/SIC Code
Generator NYSDEC Spill #932158
Facility Address 2526 Pine Avenue
City Niagara Falls State NY Zip 14301
24-hour Emergency Response Number
1-800-457-7362
Mailing Address 625 Broadway
City Albany State NY Zip 12233-0001
Generator Contact Heide-Marie Dudek, P.E.
Title Project Manager
Phone 518-402-9813 Fax 518-402-9819
E-mail heidi.dudek@dec.ny,gov

Internal Use Only: EQ Division
EQ Customer No.
Invoicing Company : Veolia
Address : 360 Woodward Ave.
City : Tonawanda State : NY Zip : 14216
Country
Invoicing Contact : Michelle Vinson
Phone : 716-879-0600 Fax
Technical Contact : Michelle Vinson
Phone Fax
Cell Phone
E-mail : Michelle.Vinson@Veolia.com

Section 2 – Shipping & Packaging Information

2.1) Shipping Volume & Frequency:
a) Volume of Waste to be Shipped: 275 gallons (5x55 gal drums)
b) Frequency: ☒ One time ☐ Month ☐ Year ☐ Other:

2.2) DOT Information
a) Is this a U.S. Department of Transportation (USDOT) Hazardous Material? ☒ Yes ☐ No
b) If "Yes", indicate the proper shipping name per 49CFR 172.101 Hazardous Materials Table:
D039

Section 3 – Special Properties

3.1) Color Clear
3.2) Odor ☒ None ☐ Ammonia ☐ Amines ☐ Mercaptans ☐ Sulfur ☐ Organic Acid ☐ Amines/Ammonia ☐ Other:
3.3) Consistency at 70°F: ☒ Solid ☐ Dust/Powder ☐ Debris ☐ Sludge ☒ Liquid ☐ Gas/Aerosol ☐ Varies
3.4) What is the pH? ☐ ≤2 ☐ 2.1-4.9 ☐ 5 – 10 ☐ 10.1 – 12.4 ☒ ≥12.5 ☒ N/A

3.5) What is the flash point? ☐ <90^{0}F ☐ 90-139^{0}F ☐ 140-199^{0}F ☐ >200^{0}F ☒ N/A

3.6) Does this waste exhibit any of the following properties? **(check all that apply)**

☒ **None**	☒ Free Liquids	☐ Metal Fines	☐ Water Reactive	☐ Biohazard
☐ Shock Sensitive	☐ Oily Residue	☐ Dioxins	☐ Furans	☐ Aluminum
☐ Asbestos – non-friable	☐ Asbestos – friable	☐ Other Radioactive	☐ Air Reactive	☐ Isocyanates
☐ Biodegradable Sorbents	☐ Pyrophoric	☐ Reactive Sulfide	☐ Reactive Cyanide	☐ Explosives
☐ Temperature Controlled Organic Peroxide		☐ NORM	☐ TENORM	

Section 4 – Composition and Generating Process

4.1) Provide a physical and chemical composition of the waste (e.g. soil, water, PPE, debris, etc.). List the percent ranges of the material, either estimated or known.

soil 100 to 100 % to % to %

to % to %

to % to %

4.2) Provide a description of the generating process. *Remediation & IDW Sites: please provide a site history.*
Investigation-derived wastes from well installation at a former dry cleaning facility

4.3) Are there any known previous handling or treatment issues involving this waste? ☐ Yes* ☒ No
*If yes, describe:

Section 5 – Hazardous Wastes

As determined by 40 CFR, Part 261 and State Rules: **Please list applicable waste code(s):**

5.1) Is this waste exempted from RCRA? ☐ Yes, please provide exemption: ☒ No

5.2) Is this an EPA RCRA listed hazardous waste (F, K, P or U)? ☒ Yes: F001 ☐ No
a) For F006–F009, F012, does this come from a generator that conducts a cyanide plating process? ☐ Yes ☒ No

5.3) Is this an EPA RCRA characteristic hazardous waste (D001-D043)? ☒ Yes:D039 ☐ No

5.4) Do any State Specific Hazardous Waste Codes apply? ☐ Yes: ☒ No

If you answered 'no' to 5.2, 5.3 and 5.4, please proceed to Section 6.

5.5) EPA Source Code: EPA Form Code:

5.6) Waste Code Determination Is Based On: ☒ Generator Knowledge ☐ Analysis ☐ MSDS
Analysis and/or MSDS may be required for review and approval for hazardous and non-hazardous waste streams.

5.7) Does this waste exceed Land Disposal Restriction levels? ☒ Yes ☐ No

a) Is this stream a wastewater (WW) or non-wastewater (NWW)? ☐ WW ☒ NWW
b) If this waste stream is greater than 50% soil, does it meet the alternative soil treatment standards of 40CFR 268.49? ☐ Yes ☒ No
c) Does this waste contain greater than 50% debris, by volume? ☐ Yes ☒ No
(Debris is greater than 2.5 inches in size.)
d) If the debris is larger than 3 ft x 3 ft x 3 ft, please provide the approximate dimensions and weight:

5.8) If this is a characteristic hazardous waste, does it contain Underlying Hazardous Constituents? ☐ Yes* ☒ No

*If Yes, please list:

For a complete list of UHC constituents, please refer to 40 CFR 268.48

Section 6 – Non-Hazardous Wastes

Please list applicable waste code(s):

6.1) Do any State Specific Non-Hazardous Waste Codes apply? ☐ Yes ☒ No

6.2) Is this a Universal (UNIV) waste or a Recyclable Good (RG)? ☐ UNIV ☐ RG ☒ N/A

6.3) Is this waste used oil as defined by 40 CFR Part 279? ☐ Yes ☒ No

a) If yes, is the total halogen content of the used oil waste stream greater than 1,000 ppm? ☐ Yes ☒ No

b) If yes, what is the source of the halogen content?

- ☐ This is a metalworking oil/fluid containing chlorinated paraffins.
- ☐ This is used oil contaminated with chlorofluorocarbons from refrigeration units.
- ☐ This oil contains halogenated solvents. List specific solvents:
- ☐ Other, describe:

Section 7 – TSCA Information

7.1) What is the concentration of PCBs in the waste? ☒ None ☐ 0-49 ppm ☐ 50-499 ppm ☐ 500+ ppm

7.2) Does the waste contain PCB contamination from a source with a concentration ≥ 50 ppm? ☐ Yes ☒ No ☐ Unknown

If you answered "none" or "0-49 ppm"' to 7.1 and "no" to 7.2, please proceed to Section 8.

7.3) Has this waste been processed into a non-liquid form? ☐ Yes* ☒ No

*If yes, what was the concentration of PCBs prior to processing? ☐ 0-499 ppm ☐ 500+ ppm

7.4) Is this non-liquid PCB waste in the form of soil, rags, debris, or other contaminated media? ☐ Yes ☒ No

7.5) Are you a PCB capacitor manufacturer or a PCB equipment manufacturer? ☐ Yes ☒ No

7.6) Has the PCB Article (e.g., transformer, hydraulic machine, PCB-contaminated electrical equipment) been drained/flushed of all PCBs and decontaminated in accordance with 40 CFR 761.60(b)? ☐ N/A ☐ Yes ☒ No

Section 8 – Clean Air Act Information

8.1) Is this waste subject to regulation under 40 CFR, Part 264, Subpart CC (VOC > 500 ppmw)? ☐ Yes ☒ No

8.2) Is this waste subject to regulation under 40 CFR, Part 63, Subpart DD (VOHAP > 500 ppmw)? ☐ Yes ☒ No

8.3) Is the site, or waste, subject to any other NESHAP/MACT standard(s)? ☐ Yes* ☒ No

*If Yes this document serves as notification that this waste contains chemicals , required to be managed in accordance with Part ☐ 61 ☐ 62 ☐ 63 Subpart of NESHAP/MACT standards.

8.4) Does this waste stream contain Benzene? ☒ Yes ☐ No

If you answered "no" to 8.4, please proceed to Section 9.

8.5) Does the waste stream come from a facility subject to 40 CFR 61, Subpart FF (Benzene NESHAP)?

☐ Yes, please provide the SIC/NAICS code: ☒ No

If you answered "no" to questions 8.5, please proceed to Section 9.

8.6) Does your facility manage the waste subject to Benzene NESHAP in a manner other than shipping off-site?

☐ Yes, please specify: ☐ No

8.7) Is the generating source of this waste a facility with Total Annual Benzene (TAB) ≥10 Mg/year? ☐ Yes ☒ No

8.8) Does the waste contain >10% water? ☐ Yes ☒ No

8.9) What is the TAB quantity for your facility? Mg/Year

8.10) What is the total Benzene concentration in your waste? Percent or ppmw.

Supporting analysis must be attached. Do not use TCLP analytical results. Acceptable laboratory methods include 8020, 8240, 8260, 602 and 624.

Section 9 – Certification

I certify that all information (including attachments) is complete and factual and is an accurate representation of the known and suspected hazards, pertaining to the waste described herein. I authorize EQ's personnel to add supplemental information to the waste approval file, provided I am contacted and give verbal permission. I authorize EQ's personnel to obtain a sample from any waste shipment for purposes of verification and confirmation. I agree that, if EQ approves the waste described herein, all such wastes that are transported, delivered, or tendered to EQ by Generator or on Generator's behalf shall be subject to, and Generator shall be bound by, the attached Standard Terms and Conditions.

If I am an agent acting on behalf of the generator, I also certify that I have permission to sign any and all waste characterization paperwork on the generator's behalf and that I can produce such certification in writing upon request.

Generator Signature Sara M. Weishaupt Agent for NYSDEC Printed Name Sara M. Weishaupt Agent for NYSDEC

Company PARSONS Agent for NYSDEC Title Principal Geologist Date 9/12/2019

STANDARD TERMS AND CONDITIONS

The Agreement between the Customer and EQ – The Environmental Quality Company and/or its member companies (hereinafter "EQ") related to or associated with Delivered Waste, as herein defined, shall be governed by the following Standard Terms and Conditions in addition to the terms and conditions contained in any Waste Profile Form, Customer Approval Quote Confirmation, Generator Approval Notification, Notice of Waste Approval Expiration, and/or Credit Agreement associated with such Delivered Waste.

The Customer may use its standard forms (such as purchase orders, acknowledgments of orders, and invoices) to administer its dealings under this Agreement for convenience purposes, but all provisions thereof in conflict with these terms and conditions shall be deemed stricken.

Definitions

The following definitions shall apply for purposes of this Agreement:

"Acceptable Waste" shall mean any hazardous waste, as defined under applicable State or federal law, determined by EQ as acceptable for treatment and/or disposal in accordance with this Agreement.

"Delivered Wastes" shall mean all wastes (i) which are transported, delivered, or tendered to EQ by the Customer; (ii) which the Customer has arranged for the transport, delivery or tender to EQ; or (iii)) which are transported, delivered, or tendered to EQ under a Credit Agreement between the Customer and EQ.

"Non-Conforming Wastes" shall mean wastes that (a) are not in accordance in all material respects with the warranties, descriptions, specifications or limitations stated in the Waste Profile Form and this Agreement; (b) have constituents or components of a type or concentration not specifically identified in the Waste Profile Form (i) which increase the nature or extent of the hazard and risk undertaken by EQ in treating and/or disposing of the waste, or (ii) for whose treatment and/or disposal a Waste Management Facility is not designed or permitted, or (iii) which increase the cost of treatment and/or disposal of waste beyond that specified in EQ's price quote; or (c) are not properly packaged, labeled, described, or placarded, or otherwise not in compliance with United States Department of Transportation and United States Environmental Protection Agency regulations.

Control of Operations.

EQ shall have sole control over all aspects of the operation of any treatment and/or disposal facility of EQ receiving Delivered Wastes under this Agreement (hereinafter, "Waste Management Facility"), including, without limitation, maintaining EQ's desired volume of Acceptable Wastes being delivered to any Waste Management Facility by the Customer or any other person or entity.

Identification of Waste.

For each waste material to be transported, delivered, or tendered to EQ under this Agreement, the Customer shall provide, or cause to be provided, to EQ a representative sample of the waste material and a completed Waste Profile Form containing a physical and chemical description or analysis of such waste material, which description shall conform with any and all guidelines for waste acceptance provided by EQ. On the basis of EQ's analysis of such representative sample of the waste material and such Waste Profile Form, EQ will determine whether such wastes are Acceptable Wastes. EQ does not make any guarantee that it will handle any waste material or any particular quantity or type of waste material, and EQ reserves the right to the decline to transport, treat and/or dispose of waste material. The Customer shall promptly furnish to EQ any information regarding known, suspected or planned changes in the composition of the waste material. Further, the Customer shall promptly inform EQ of any change in the characteristic or condition of the waste material which becomes known to the Customer subsequent to the date of the Waste Profile Form.

Non-Conforming Wastes.

In the event that EQ at any time discovers that any Delivered Waste is Non-Conforming Waste, EQ may reject or revoke its acceptance of the Non-Conforming Waste. The Customer shall have seven (7) days to direct an alternative lawful manner of disposition of the waste, unless it is necessary by reason of law or otherwise to move the Non-Conforming Waste prior to expiration of the seven (7) day period. If the Customer does not direct an alternative disposal, at its option, EQ may return any such Non-Conforming Wastes to the Customer, and the Customer shall pay or reimburse EQ for all costs and expenses incurred by EQ in connection with the receipt, handling, sampling, analyses, transportation and return to the Customer of such Non-Conforming Wastes. If it is impossible or impractical for EQ to return the Non-Conforming Waste to the Customer, the Customer shall reimburse EQ for all costs, of any type or nature whatsoever, incurred by EQ, solely because such Delivered Waste was Non-Conforming Waste (including, but not limited to, all costs associated with any remedial steps necessary, due to the nature of the Non-Conforming Waste, in connection with material with which the Non-Conforming Waste may have been commingled and all expenses and charges for analyzing, handling, locating, preparing for transporting, storing and disposing of any Non-Conforming Waste).

Customer Warranty - Acceptable Wastes.

All Delivered Wastes shall be Acceptable Wastes and shall conform in all material respects to the description and specifications contained in the Waste Profile Form. The information set forth in the Waste Profile Form or any manifest, placard or label associated with any Delivered Wastes, or otherwise represented by the Customer or the generator (if other than the Customer) to EQ, is and shall be true, accurate and complete as of the date of receipt of the involved waste by EQ.

Customer Warranty - Title to Wastes.

Either the Customer or the generator (if other than the Customer) shall hold clear title, free of any all liens, claims, encumbrances, and charges to Delivered Waste until such waste is accepted by EQ.

Customer Warranty - Compliance with Laws.

The Customer shall comply with all applicable federal, state and local environmental statutes, regulations, and other governmental requirements, as well as directives issued by EQ from time to time, governing the transportation, treatment and/or disposal of Acceptable Wastes, including, but not limited to, all packaging, manifesting, containerization, placarding and labeling requirements.

Customer Warranty - Updating Information.

If the Customer receives information that Delivered Waste or other hazardous waste described in the Waste Profile Form, or some component of such waste, presents or may present a hazard or risk to persons, property or the environment which was not disclosed to EQ, or if the Customer or generator (if other than the Customer) has changed the process by which such waste results, the Customer shall promptly report such information to EQ in writing.

Customer Indemnity.

The Customer shall indemnify, defend and hold harmless EQ, and its affiliated or related companies, and all of their respective present or future officers, directors, shareholders, employees and agents from and against any and all losses, damages, liabilities, penalties, fines, forfeitures, demands, claims, causes of action, suits, costs and expenses (including, but not limited to, reasonable costs of defense, settlement, and reasonable attorneys' fees), which may be asserted against any or all of them by any person or any governmental agency, or which any or all of them may hereafter suffer, incur, be responsible for or pay out, as a result of or in connection with bodily injuries (including, but not limited to, death, sickness, disease and emotional or mental distress) to any person (including EQ's employees), damage (including, but not limited to, loss of use) to any property (public or private), or any requirements to conduct or incur expense for investigative, removal or remedial expenses in connection with contamination of or adverse effect on the environment, or any violation or alleged violation of any statues, ordinances, orders, rules or regulations of any governmental entity or agency, caused or arising out of (i) a breach of this Agreement by the Customer, (ii) the failure of any warranty of the Customer to be true, accurate and complete, or (iii) any willful or negligent act or omission of the Customer, or its employees or agents in connection with the performance of this Agreement.

Force Majeure

EQ shall not be liable for any failure to accept, receive, handle, treat, and/or dispose of Delivered Waste due to an act of God, fire, casualty, flood, war, strike, lockout, labor trouble, failure of public utilities, equipment failure, facility shutdown, injunction, accident, epidemic, riot, insurrection, destruction of operation or transportation facilities, the inability to procure materials, equipment, or sufficient personnel or energy in order to meet operational needs without the necessity of allocation, the failure or inability to obtain any governmental approvals or to meet Environmental Requirements (including, but not limited to voluntary or involuntary compliance with any act, exercise, assertion, or requirement of any governmental authority) which may temporarily or permanently prohibit operations of EQ, the Customer, or the Generator, or any other circumstances beyond the control of EQ which prevents or delays performance of any of its obligations under this Agreement.

Governing Laws

This Agreement shall in all respects be governed by and shall be construed in accordance with the laws of the State of Michigan applied to contracts executed and performed wholly within such state.

Bulk Disposal Charges

Quoted bulk disposal charges for solid materials will be billed by the cubic yard, if the waste density is less than 2,000lbs./cubic yard. If waste density is greater than 2,000 lbs./cubic yard, then bulk disposal charges will be billed by the ton, regardless of the approved container.

VEOLIA
ENVIRONMENTAL SERVICES

SHIPPING DOCUMENT

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Shipping Document Tracking Number
NYCESQG	1	(877) 518-0037	ZZ 00451533

GENERATOR

5. Generator's Name and Mailing Address
NYSDEC CENTRAL OFFICE
270 MICHIGAN AVENUE
BUFFALO, NY 14203
Generator's Phone: 716 851-7220

Generator's Site Address (if different than mailing address)
2526 PINE AVENUE
NIAGARA FALLS, NY 14301

6. Transporter 1 Company Name
VEOLIA ES TECHNICAL SOLUTIONS
U.S. EPA ID Number: NYD066313569

7. Transporter 2 Company Name
FREEHOLD CARTAGE INC
U.S. EPA ID Number: NYD054126164

8. Designated Facility Name and Site Address
VEOLIA ES TECHNICAL SOLUTIONS, LLC
4301 INDUSTRIAL ROAD
WEST CARROLLTON, OH 45449
937 859-8101
Facility's Phone:
U.S. EPA ID Number: OHD093945293

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Codes
	1. , 3016	2	DM	1000	P	
	2.	2	DM	1000	P	
	3.					
	4.					

14. Special Handling Instructions and Additional Information
carriers agency authority to initial transporter to add or substitute additional transporters on generator's behalf. 1) W 617470 A SRRLF/LIQ NH 2) W 617470 A SRRLF/SOLID-NH

15. **GENERATOR S/OFFEROR S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: x Megan Clark
Signature: x [signature] As agent for NYSDEC
Month: 09 Day: 19 Year: 19

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Shipment

Transporter 1 Printed/Typed Name
Signature: [signature]
Month: 09 Day: 19 Year: 19

Transporter 2 Printed/Typed Name
Signature
Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Shipping Document Tracking Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month Day Year

19. Report Management Method Codes (i.e., codes for treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of shipment except as noted in Item 18a

Printed/Typed Name
Signature
Month Day Year

GENERATOR / SHIPPER'S INITIAL COPY

APPENDIX E-2 DEWATERING EVENTS WASTE MANIFESTS

D145016

Form Approved. OMB No. 2050-0039

Please print or type.

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number N/A USQG	2. Page 1 of 1	3. Emergency Response Phone 800-394-8606	4. Manifest Tracking Number 014280994 FLE

GENERATOR

5. Generator's Name and Mailing Address
NYSDEC NIAGARA FALLS
2526 PINE AVENUE
NIAGARA FALLS, NY 14301
315-415-5316

Generator's Site Address (if different than mailing address)

Generator's Phone:

6. Transporter 1 Company Name: MILLER ENVIRONMENTAL GROUP, INC — U.S. EPA ID Number: NYD986908085

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address
CYCLE CHEM, INC.
217 SOUTH FIRST ST.
ELIZABETH, NJ 07206
908-355-5800

U.S. EPA ID Number: NJD002200046

Facility's Phone:

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. NA3082, Hazardous waste, liquid, n.o.s. (Tetrachloroethylene, Trichloroethylene), 9, III, RQ	4 X FL	TT DM	~~220~~ 250 R	G	D039 D040 F004
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
Document # D34981 Job#: NY16230021 PO#: Y X55671
1) 26635 - DIRECT-HAZ ERG#171

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Megan Clark as agent for and on behalf of NYSDEC — Signature: as agent for and on behalf of NYSDEC — Month 01 Day 20 Year 23

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: Date leaving U.S.:
Transporter signature (for exports only):

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Brett Carter — Signature: Brett Carter — Month 01 Day 20 Year 23

Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H141			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: J Coriano — Signature: J Coriano — Month 1 Day 25 Year 23

EPA Form 8700-22 (Rev. 12-17) Previous editions are obsolete. DESIGNATED FACILITY TO EPA'S e-MANIFEST SYSTEM

452276. 3000000

MILLER ENVIRONMENTAL GROUP INC.
Responding with Innovation, Professionalism and Integrity Since 1971
www.millerenv.com

Remit To:
538 Edwards Avenue
Calverton, New York 11933
Phone: (631) 369-4900
Fax: (631) 369-4996

Invoice

Date	Invoice #
1/29/2021	10016506

Bill To
Parsons Engineering 301 Plainfield Road Suite 350 Syracuse, New York 13212

Services provided by:
MEG's Buffalo NY Operations
4429 Walden Avenue
Lancaster, NY 14086

P.O. No.	Terms	Job Number
452276.30000.00	Net 30	NY16210024

Description	Qty	U/M	Rate	Amount
Contact: Michelle Gugliuzza				
Site: NYSDEC #932158 Niagara Falls NY				
Project: 448433				
Vacuum Dewatering Services				
1/21/2021 - Quoted As:				
Mobilization/Demobilization	1	lump sum	$250.00	$250.00
Hourly rate for vac truck	6.5	hours	$100.00	$650.00
Hourly rate for vac truck crew	6.5	hours	$63.00	$409.50
Hazardous Profiling Fee	1	each	$75.00	$75.00
Hazardous Disposal Transportation	1	lump sum	$2,550.00	$2,550.00
Hazardous Disposal -Liquid Waste	275	gallon	$3.60	$990.00

Thank you for allowing Miller Environmental Group, Inc. the opportunity to do work with your company.

Subtotal	$4,924.50
Sales Tax (0.0%)	
Total	$4,924.50
Payments/Credits	
Balance Due	$4,924.50

Past due invoices may be subject to 18% per annum interest charge.

Call us @ 1-800-394-8606 or visit us on the web

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	NYD012966156	1	800.394.8606	001215540 FLE

GENERATOR

5. Generator's Name and Mailing Address
Parsons Engineering
301 Plainfield Rd.
Syracuse, NY 13212
Generator's Phone: **315-552-9693**

Generator's Site Address (if different than mailing address)
NYSDEC #932158
2532 Pine Avenue
Niagara Falls, NY 14301

6. Transporter 1 Company Name: **Miller Environmental Group, Inc.** — U.S. EPA ID Number: **NYD986908085**

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Cycle Chem - PA
550 Industrial Drive
Lewisberry, PA 17339
Facility's Phone: **717-938-4700**
U.S. EPA ID Number: **PAD067098822**

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. **RQ NA3082, Hazardous Waste Liquid, N.O.S. (Tetrachloroethylene, Trichloroethylene), 9, III**	1	TT	168 GAL	G	F002 D039 D040 T
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
Line 1. Approval #: 136885 ERG# 171
Job #: NY16210024

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: JEREMY NEUMANN / PARSONS DEC — Signature: Jeremy J. Neuman — Month 1 Day 21 Year 21

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: DANIEL J. DOROBIALA — Signature: Daniel J. Dorobiala — Month 1 Day 21 Year 21

Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name — Signature — Month Day Year

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Please print or type.

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number NYD012966156	2. Page 1 of 1	3. Emergency Response Phone 800.334.8606	4. Manifest Tracking Number 014280975 FLE

GENERATOR

5. Generator's Name and Mailing Address
Parsons Engineering
301 Plainfield Road
Syracuse, NY 13212
315-552-8883
Generator's Phone:

Generator's Site Address (if different than mailing address)
NYSDEC #932168
2632 Pine Avenue
Niagara Falls, NY 14301

6. Transporter 1 Company Name: Miller Environmental Group, Inc.
U.S. EPA ID Number: NYD986908085

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
Cycle Chem - PA
560 Industrial Drive
Lewisberry, PA 17339
717-938-4709
Facility's Phone:
U.S. EPA ID Number: PAD067098822

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. RQ NA3082, Hazardous Waste Liquid, N.O.S. (Tetrachloroethylene, Trichloroethylene), 9, III	1 / 2	PT / DM	90	G	F002 / T	D039	D040
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
Line 1. Approval #: 136885 ERG# 171 2 x 55 Gal
Job #: NY16210239

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Peter Schuchmann (Parsons) As Agent for NYS DEC (Parsons)
Signature
Month 8 Day 18 Year 21

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: R. Romano
Signature
Month 8 Day 18 Year 21

Transporter 2 Printed/Typed Name: Dylan Boozer
Signature
Month 8 Day 35 Year 21

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H141			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: Annie E. Hied
Signature: Annie E. Hied
Month 9 Day 13 Year 21

EPA Form 8700-22 (Rev. 12-17) Previous editions are obsolete.

DESIGNATED FACILITY TO EPA's e-MANIFEST SYSTEM

Cycle Chem

Recycling, Treatment & Disposal of Hazardous Waste

*217 South First Street, Elizabeth, NJ 07206 * 908-355-5800, Fax (908) 355-0562*

Generator Name: NYS DEC

Generator EPA ID #: NYD012966156

Manifest #: 014280975FLE

LAND DISPOSAL RESTRICTION NOTIFICATION AND CERTIFICATION FORM

This land disposal restriction (LDR) notification must be submitted with the initial shipment of all new waste streams. Subsequent notification is not required unless the waste stream changes. All sections MUST be completed. **INSTRUCTION**

WASTE STREAM INFORMATION – For each manifest line complete the following sections. For LDR's previously submitted or LAB PACK's with packing slips indicate such in column A or B and stop.

	A	B	C	D Treatability Group		E	F Treatment Method for Hazardous Waste per 40CFR268			
Line #	LDR on file Non RCRA	Lab Pack & Packing Slip	EPA Waste Codes and subcategory reference letter from table (if applicable)	WW Wastewater < 1% TOC < 1% TSS / NWW/ Not WW		F001 to F005 list numbers of Spent Solvent Constituents	Requires treatment mark which standard applies / For Atl SOIL Treatment Complete certification below			Meets LDR treatment standards 40CFR268 Listed Waste Certify below
1	☐	☐	D039, D040, F002	☒ NWW	☐ WW	21, 25	☒ Other	☐ SOIL	☐ DEBRIS	☐
2	☐	☐		☐ NWW	☐ WW		☐ Other	☐ SOIL	☐ DEBRIS	☐
3	☐	☐		☐ NWW	☐ WW		☐ Other	☐ SOIL	☐ DEBRIS	☐
4	☐	☐		☐ NWW	☐ WW		☐ Other	☐ SOIL	☐ DEBRIS	☐

ADDITIONAL INFORMATION FOR CHARACTERISTIC CODES D001 to D043. (check one)

☐ Some or all of these waste streams contain underlying hazardous constituents (UHCs) in excess of the treatment standard of 40CFR268.40. These are indicated on the UHC/UTS table section of this LDR form or included on the waste profile.

☒ There are no underlying hazardous constituents (UHCs) present in any of these waste streams.

SUBCATEGORY LETTER TABLE

D001	A	Ignitable except high TOC ignitable liquids
	B	High TOC (> 10%) ignitable liquid
D003	A	Reactive sulfide
	B	Reactive cyanide
	C	Water reactive
	D	Other reactive
D006	A	Cadmium non-battery
	B	Cadmium containing batteries
D008	A	Lead non-battery
	B	Lead acid batteries
D009	A	High mercury organic (>260 PPM Total Hg)
	B	High mercury inorganic (> 260 PPM Total Hg)
	C	Low mercury (< 260 PPM Total Hg)
	D	Mercury wastewater

SPENT SOLVENT WASTE CONSTITUENTS

For F001-F005 indicate number of constituent in above table

1) -acetone	**15)** methanol
2) benzene	**16)** methylene chloride
3) n-butyl alcohol	**17)** methyl ethyl ketone
4) iso-butyl alcohol	**18)** methyl isobutyl ketone
5) carbon disulfide	**19)** nitrobenzene
6) carbon tetrachloride	**20)** pyridine
7) chlorobenzene	**21)** tetrachloroethylene {Perc}
8) Cresols [o, m or p]	**22)** toluene
9) cresylic acid	**23)** 1,1,1,-trichloroethane
10) cyclohexanone	**24)** 1,1,2-trichloroethane
11) o-dichlorobenzene	**25)** trichloroethylene
12) ethyl acetate	**26)** trichloromonofluoromethane
13) ethyl benzene	**27)** 1,1,2-trichloro-1,2,2,-trifluoroethane
14) ethyl ether	**28)** xylenes

☐ ***This SOIL CERTIFICATION per alternate soil treatment {268.49} for indicated [circle] items.***

*This is a hazardous waste contaminated soil. This contaminated soil **does/does not** (circle one) contain listed hazardous wastes and **does/does not** (circle one) exhibit a characteristic of hazardous waste and **is subject to/complies with** (circle one) the soil treatment standards as provided by 268.49(c) or the universal treatment standards.*

☐ ***This Certification for material that meets treatment standards applies to the above listed items.***

This is an EPA hazardous waste that meets all applicable treatment standards set forth in 40 CFR 268 subpart D, and can be landfilled without further treatment. I certify under penalty of law that I have personally examined and am familiar with the waste through analysis and testing or thorough knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d). I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.

CERTIFICATION- All section MUST be completed: I certify that all information on this and all associated documents is complete and accurate to the best of my knowledge.

Signature: _____ **Title:** _____

Printed Name: _____ **Date:** _____

Cycle Chem

Recycling, Treatment & Disposal of Hazardous Waste

*217 South First Street, Elizabeth, NJ 07206 * 908-355-5800, Fax (908) 355-0562*

Generator Name: NYSDEC

Generator EPA ID #: NYD982966156

Manifest #: 001215534 FLE

LAND DISPOSAL RESTRICTION NOTIFICATION AND CERTIFICATION FORM

This land disposal restriction (LDR) notification must be submitted with the initial shipment of all new waste streams. Subsequent notification is not required unless the waste stream changes. All sections MUST be completed. **INSTRUCTION**

WASTE STREAM INFORMATION – For each manifest line complete the following sections. For LDR's previously submitted or LAB PACK's with packing slips indicate such in column A or B and stop.

	A	B	C	D Treatability Group		E	F Treatment Method for Hazardous Waste per 40CFR268			
Line #	LDR on file Non RCRA	Lab Pack & Packing Slip	EPA Waste Codes and subcategory reference letter from table (if applicable)	WW Wastewater < 1% TOC < 1% TSS / NWW/ Not WW		F001 to F005 list numbers of Spent Solvent Constituents	Requires treatment mark which standard applies / For Atl SOIL Treatment Complete certification below			Meets LDR treatment standards 40CFR268 Listed Waste Certify below
1	☐	☐	21, 25	☐ NWW	☑ WW	F002	☑ Other	☐ SOIL	☐ DEBRIS	☐
2	☐	☐		☐ NWW	☐ WW		☐ Other	☐ SOIL	☐ DEBRIS	☐
3	☐	☐		☐ NWW	☐ WW		☐ Other	☐ SOIL	☐ DEBRIS	☐
4	☐	☐		☐ NWW	☐ WW		☐ Other	☐ SOIL	☐ DEBRIS	☐

ADDITIONAL INFORMATION FOR CHARACTERISTIC CODES D001 to D043. (check one)

☑ Some or all of these waste streams contain underlying hazardous constituents (UHCs) in excess of the treatment standard of 40CFR268.40. These are indicated on the UHC/UTS table section of this LDR form or included on the waste profile.

☐ There are no underlying hazardous constituents (UHCs) present in any of these waste streams.

SUBCATEGORY LETTER TABLE

D001	A	Ignitable except high TOC ignitable liquids
	B	High TOC (> 10%) ignitable liquid
D003	A	Reactive sulfide
	B	Reactive cyanide
	C	Water reactive
	D	Other reactive
D006	A	Cadmium non-battery
	B	Cadmium containing batteries
D008	A	Lead non-battery
	B	Lead acid batteries
D009	A	High mercury organic (≥260 PPM Total Hg)
	B	High mercury inorganic (> 260 PPM Total Hg)
	C	Low mercury (< 260 PPM Total Hg)
	D	Mercury wastewater

SPENT SOLVENT WASTE CONSTITUENTS

For F001-F005 indicate number of constituent in above table

1) -acetone	15) methanol
2) benzene	16) methylene chloride
3) n-butyl alcohol	17) methyl ethyl ketone
4) iso-butyl alcohol	18) methyl isobutyl ketone
5) carbon disulfide	19) nitrobenzene
6) carbon tetrachloride	20) pyridine
7) chlorobenzene	21) tetrachloroethylene {Perc}
8) Cresols [o, m or p]	22) toluene
9) cresylic acid	23) 1,1,1,-trichloroethane
10) cyclohexanone	24) 1,1,2-trichloroethane
11) o-dichlorobenzene	25) trichloroethylene
12) ethyl acetate	26) trichloromonofluoromethane
13) ethyl benzene	27) 1,1,2-trichloro-1,2,2,-trifluoroethane
14) ethyl ether	28) xylenes

☐ ***This SOIL CERTIFICATION per alternate soil treatment {268.49} for indicated [circle] items.***

*This is a hazardous waste contaminated soil. This contaminated soil **does/does not** (circle one) contain listed hazardous wastes and **does/does not** (circle one) exhibit a characteristic of hazardous waste and **is subject to/complies with** (circle one) the soil treatment standards as provided by 268.49(c) or the universal treatment standards.*

☐ ***This Certification for material that meets treatment standards applies to the above listed items.***

This is an EPA hazardous waste that meets all applicable treatment standards set forth in 40 CFR 268 subpart D, and can be landfilled without further treatment. I certify under penalty of law that I have personally examined and am familiar with the waste through analysis and testing or thorough knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d). I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.

CERTIFICATION- *All section MUST be completed:* I certify that all information on this and all associated documents is complete and accurate to the best of my knowledge.

Signature: Jeremy E. Neumann **Title:** Senior Scientist

Printed Name: Jeremy E. Neumann **Date:** December 22, 2020

Waste Information Profile Form

☒ **ENPRO Services of Maine, Inc.**
106 Main Street
S. Portland, ME 04106
Phone: 207.799.0850 Fax: 207-799-5565
MED019051069

☒ **ENPRO Services of Vermont, Inc**
54 Avenue D
Williston, VT 05495
Phone: 802.860.1200 Fax: 802.860.7202
VTR000517052

Profile #: _____ Process Code: _____ Approval Code: _____
Facility Use

1. Generator Information:
Generator Name: NYSDEC #932158
Mailing Address: 2532 PINE AVE.
City: NIAGARA FALLS State: NY Zip: 14301 Phone: 315-552-9693
Site Address: SAME
City: _____ State: __ Zip: _____
Technical Contact: _____ Phone: ____
Site EPA ID: _____ NAICS Code: _____

2. Billing Information:
Customer Name: MILLER ENVIRONMENTAL GROUP Address: 4429 WALDEN AVENUE
City: LANCASTER State: NY Zip: 14086
Billing Contact: MARY MCDONNELL Email: MMCDONNELL@EPSOFVERMONT.COM
Phone: 716-597-0001 Fax: 716-597-0505

3. Waste Description:
Common Name of Waste: PCE IMPACTED WATER FROM SVE SYSTEM
Process Generating Waste ONGOING REMEDIATION

4. Physical & Chemical Properties
Color: WATER WHITE Odor ☒ None ☐ Mild ☐ Strong Describe: _____

Flash Point (F°) ☐ <100 ☐ ≥100-140 ☐ ≥140-200 ☒ >200 ☐ N/A	BTU/lb ☐ <2000 ☐ 2,000-6,000 ☐ >6,000-10,000 ☐ >10000 ☒ N/A	☐ Solid ☒ Liquid ☐ Sludge ☐ Semi-solid ☐ Powder ☐ Gas	Free Liquids? ☒ Yes ☐ No 1% Solids 99% Liquids Will waste dump out of drums? ☒ Yes ☐ No Is the waste pumpable? ☒ Yes ☐ No Debris?(List type in Section 7) ☐ Yes ☒ No Is the waste dusty? ☐ Yes ☒ No

Specific Gravity	Viscosity	pH	Other Components
☐ < 0.8 (Light oil) ☒ 0.8-1.0 (Water based) ☐ > 1.0 (Chlorinated Solvents) ☐ N/A	☒ Low (Water) ☐ Med (Pump on) ☐ High (Molasses) ☐ N/A	☐ ≤ 2.0 ☐ >2.0-5 ☒ >5-9 ☐ >9-12.49 ☐ ≥ 12.5	Total cyanides (ppm) 0 Total sulfides (ppm) 0 PCBs (ppm) 0 Total Halogens /HOC (%) 0 Total VOC (ppm) 0

5. Hazardous Properties: (Check all that apply)

☒ None	☐ Radioactive	☐ Pyrophoric	☐ Oxidizer
☐ Water Reactive	☐ Dioxins	☐ Explosive	☐ Medical Waste/Infectious
☐ Shock Sensitive	☐ Air Reactive	☐ Reactive Cyanide	☐ Reactive Sulfide
☐ Asbestos	☐ Benzene NESHAP	☐ Pesticide/Herbicide	☐ Peroxide Forming Compound

6. Regulatory Status (Check all that apply)

Y	N	
☒	☐	USEPA Hazardous Waste per 40 CFR 261 (If yes list codes) F002, D039, D040
☐	☒	Do any state waste codes apply? (If yes list codes) _____
☒	☐	Is this waste subject to land ban restrictions?
		Is this a ☒ wastewater ☐ non wastewater
☒	☐	If DOO1-D043, are any underlying hazardous constituents (UHC) present
☐	☒	Does this waste contain VOC's ≥ 500 ppm (subpart CC)

Form Code _____ Source Code _____

Profile #: _____

7. Composition of Waste: (List all haz. And non-haz. Constituents)

GROUND WATER	98 - 99%
SOLIDS (SILT) TSS, TDS	1 - 2%
TRICHLOROETHENE 9430 PPB	___ - ___%
TETRACHLOROETHYLENE 187000 PPB	___ - ___%
_____	___ - ___%
_____	___ - ___%
_____	___ - ___%
_____	___ - ___%
_____	___ - ___%
_____	___ - ___%

8. DOT Shipping Information: (include PG, UN/NA, and Haz. Class)

NA3082 RQ HAZARDOUS WASTE LIQUID, N.O.S. (PCE, TRICHLOROETHYLENE)

Poison Inhalation Hazard: ☐ YES ☒ NO Zone: _____

Method of Shipment: ☐ Bulk Liquid ☐ Bulk Solid ☐ Drums ☐ Other Container type size: 275 G TP

Volume per shipment: 6 ☐ Gallons ☐ Tons ☒ Drums ☐ Other _____

Frequency: ☐ One Time ☐ Weekly ☐ Monthly ☐ Quarterly ☒ Yearly ☐ Other _____

Does this material require any special handling? ☐ Yes ☒ No If yes, explain: _____

9. Inorganic Metals: ☒ None ☒ TCLP ☐ Totals ☐ Generator Knowledge in mg/l

D004 Arsenic (5mg/l)	_____	D011 Silver (5mg/l)	_____	Manganese	_____
D005 Barium (100mg/l)	_____	Aluminum	_____	Molybdenum	_____
D006 Cadmium (1mg/l)	_____	Antimony	_____	Nickle	_____
D007 Chromium (5mg/l)	_____	Beryllium	_____	Thallium	_____
D007 Chromium-Hex	_____	Cobalt	_____	Tin	_____
D008 Lead (5mg/l)	_____	Copper	_____	Zinc	_____
D009 Mercury (0.2mg/l)	_____				
D010 Selenium (1mg/l)	_____				

10. Organic Compounds ☐ None ☐ TCLP ☐ Totals ☒ Generator Knowledge in mg/l

D012 Endrin	(0.02)	_____	D023 o-Cresol	(200)	_____	D034 Hexachloroethane	(3.0) _____
D013 Lindane	(0.4)	_____	D024 m-Cresol	(200)	_____	D035 Methyl ethyl ketone	(200) _____
D014 Methoxychlor	(10)	_____	D025 p-Cresol	(200)	_____	D036 Nitrobenzene	(2) _____
D015 Toxaphene	(0.5)	_____	D026 Cresol	(200)	_____	D037 Pentachlorophenol	(100) _____
D016 2,4-D	(10)	_____	D027 1,4-Dichlorobenzene	(7.5)	_____	D038 Pyridine	(5) _____
D017 2,4,5 TP Silvex	(1)	_____	D028 1,2- Dichloroethane	(0.5)	_____	D039 Tetrachloroethylene	(0.7) 187000
D018 Benzene	(0.5)	_____	D029 1,1-Dichloroethylene	(0.7)	_____	D040 Trichloroethylene	9430
D019 Carbon Tetrachloride	(0.5)	_____	D030 2,4 Dinitrotoluene	(0.3)	_____	D041 2,4,5-Trichlorophenol	_____
D020 Chlordane	(0.03)	_____	D031 Heptachlor (& epoxide)	(0.008)	_____	D042 2,4,6-Trichlorophenol	_____
D021 Chlorobenzene	(100)	_____	D032 Hexachlorobenzene	(0.13)	_____	D043 Vinyl Chloride	_____
D022 Chloroform	(6.0)	_____	D033 Hexachlorobutadiene	(0.5)	_____		

11. Attached Documents: ☒ Lab Data ☐ MSDS ☐ Packing List ☐ Other _____

12. Generator Certification: I hereby certify that I am the agent of the generator, and warrant on behalf of the generator, that all information submitted herein and attached documentation contains true, accurate and complete description of this material. Any sample submitted for analysis is representative of the material being offered for approval. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. I will notify ENPRO of any changes in generator status, any information on this form, or any information on attachments. This certification and signature apply to this form, to all attachments checked in Section 11, and to the land disposal restriction notification (LDR) generated from this information.

Jeremy E. Neumann	Jeremy E. Neumann	Senior Scientist	December 21, 2020
Signature	Printed Name	Title	Date

Cycle Chem, Inc.		ACV ENVIRO	Material Profile Sheet
217 South First Street Elizabeth, NJ 07206 Phone: (908) 355-5800 Fax: (908) 355-0562	550 Industrial Dr. Lewisberry, PA 17339 Phone: (717) 938-4700 Fax: (717) 938-3301		Generator Number: _____ Product Code: _____ Sales Code: _____

A. Generator Information

Generator Name NYSDEC #932158 **Generator USEPA ID** _____
Mailing Address _____
Site Address 2532 PINE AVE., Niagara Falls, NY 14301
Generator Contact _____ **Phone #** _____ **Fax #** _____

Billing Address Miller Environmental Group, Inc. 4429 Walden Ave., Lancaster, NY 14086
Billing Contact Mary McDonnell **Phone #** 716-597-0001 **Fax #** _____

Name of Waste SVE Waste **Process Generating Waste** Site Remediation

B. Physical Characteristics of Waste

Color/Physical Description: Water white, some turbidity **Specific Gravity:** 1.0
Strong Incidental Odor Present?: ☐ Yes ☑ No **Wastewater?:** ☑ Yes ☐ No
Physical State @ 70°:
☑ Single Phase ☐ Multilayered ☐ Solid ☐ Semi-solid ☐ Gas/Aerosol ☐ Loose Pack
☐ Bi-layered ☐ Powder ☐ Liquid ☐ Sludge ☐ Lab Pack

% Sludge _____ % Suspended solids 1-2 % Solid/Debris _____ % Free Liquids 98-99
Dumpable: ☐ Yes ☐ No Pumpable: ☑ Yes ☐ No Pourable: ☑ Yes ☐ No

Flashpoint: ☐ <73° ☐ 73-100° ☐ 100-140° ☐ 141-200° ☐ >200° ☑ No Flash ☐ Exact _____
Ignitable Solid: ☐ Yes ☑ No
pH: ☐ ≤2 ☐ 2.01-5 ☑ 5.01-9 ☐ 9.01-12.4 ☐ ≥12.5 ☐ Exact _____

C. Shipping Information

Quantity: 4-5 **Units:** 275/gal TP
Price: _____
Container : _____

D. Transport Information

☐ CCI to Provide Transportation
☐ Customer to Deliver to CCI
☐ Customer to Deliver to end facility Via CCI

E. Chemical Composition

Description				Range Minimum	Range Maximum
Ground Water	98-99%	Trichloroethylene 9430 PPB			
TSS	1-2%				
Perchloroethylene	187,000 PPB	See Attached Analysis			

F. Regulatory Information

EPA Hazardous Waste?: ☑ Yes ☐ No **USEPA Code(s):** F002, D039, D040
Applicable Subcategories: _____
State Hazardous Waste?: ☐ Yes ☑ No **State Code(s):** _____
D.O.T. Hazardous Waste?: ☑ Yes ☐ No **Proper Shipping Name:** NA3082, RQ HAZARDOUS WASTE LIQUID NOS (PCE, Trichloroethylene)
Class: 9 **I.D. NO:** NA3082 **P.G.:** II **R.Q.:** 100 LBS

G. Special Handling Considerations

Project Codes:
Special Handling:
Special Pricing:

H. Other Hazardous Characteristics

			None	Actual
☐ RCRA Reactive	☐ Water Reactive	PCB's	☑	
☐ Radioactive	☐ Subject to Subpart FF Benzene	Cyanides	☑	
☐ Etiological		Phenolics	☑	
☐ TSCA Regulated	☐ Oxidizing	Sulfides	☑	
☐ Pyrophoric	☐ Explosive	VOC's	☐	Trace
☐ None				

☐ Is this waste characteristically hazardous (EPA Waste Codes D004-D043):
☑ Does this waste contain underlying hazardous constituents As defined In 40 CFR 268(2)(I) at at concentrations exceeding the UTS treatment standards? If yes, list In section C.

GENERATOR CERTIFICATION: I hereby certify that all information submitted in this and attached documents is complete, contains true and accurate descriptions and is representative of the waste material, and that all relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. If CCI discovers, after having taken delivery of the waste, that any waste does not conform to the identification and description on this MPS then CCI shall provide notice of such condition to the generator and coordinate the return of the non-conforming waste to the point of origin as set forth on the manifest or to such other locations designated in writing by the generator. Generator agrees to reimburse CCI for all handling, packaging, clean-up and transportation costs or charges, damage to equipment, and costs associated with lost time incurred by CCI during the receipt, handling, temporary storage and return of such non-conforming waste to point of origin or to such other location designated by generator. I hereby authorize CCI to amend and/or correct any information on the MPS with the full understanding that if any amendment or correction is performed, I will be contacted as such to issue any approval.

GENERATOR NAME (PRINTED) Jeremy E. Neumann **AUTHORIZED SIGNATURE:** Jeremy E. Neumann
TITLE: Senior Scientist **DATE:** December 21, 2020

ACV Approval: _____ Signature: _____ Date: _____ Form Code: _____