

SID HARVEY INDUSTRIES. INC.

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# Voluntary Cleanup Project, Number V-00145-1

Valley Stream, New York

# March 2007 Revision

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# **1.0 INTRODUCTION**

NAC CONSULTANTS, INC. (NAC) was retained by Sid Harvey Industries, Inc. (SHI) to prepare this "Final Engineering Report" for the remedial construction and monitoring work completed at its facility located at 100 East Mineola Avenue in Valley Stream, New York. This report presents a summary of Operable Unit 1A: Underground Structure performed as an interim remedial measure, and describes the components and operation of Operable Unit 1: Soil Vapor Extraction System, Operable Unit 2A: Air Sparge System, and Operable Unit 2, the bioremediation pilot study for groundwater. The March 2007 revised "Operable Units 1& 2 - Soil Vapor Extraction & Air Sparge System Operation, Monitoring and Maintenance Plan" (OM&M Plan) is presented in Appendix A. This report is submitted in accordance with New York State Department of Environmental Conservation (NYSDEC) Voluntary Cleanup Agreement index number W1-0809-98-03.

# 2.0 FACILITY DESCRIPTION

SHI operated a manufacturing facility at 100 East Mineola Avenue, Valley Stream, New York. The plant operated 8 hours per day, 5 days a week until July 2006 when it ceased production. SHI reconditioned and rebuilt pumps, motors and controls for oil-fired boilers at the plant. Concentrated spent aqueous cleaners and chemicals were generated in the rebuilding operations and were drummed and stored in an outdoor drum storage building at the west side of the facility. SHM shipped the drummed hazardous waste to off-site, permitted treatment, storage and/or disposal facilities (TSD). The facility began closure activities in accordance with New York State regulations in July 2006.

The site is approximately 1 acre with approximately 33,000 square feet of manufacturing and office space. There is one manufacturing and office building, a hazardous materials storage shed, and a flammable materials storage shed onsite. The area around the buildings is paved for parking. The bordering properties include residential and industrial properties, and the Long Island Rail Road.

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# **3.0 REMEDIAL ACTION**

# **3.1 Underground Structure**

The scope of work for the investigation of the underground structure was detailed in the "Underground Structure Investigation Work Plan, October 2002" and the results of the investigation and remediation can be found in the "Underground Structure Investigation and Soil Excavation Report, November 2003." The remediation was performed as an interim Remedial Measure (IRM) and defined by NYSDEC as Operable Unit 1A. The above referenced documents are included in electronic format in Appendix B. The work is summarized below.

## 3.1.1 Summary

Test pits were excavated to determine the extent of the structure. The structure was found to be approximately 15 feet long by 15 feet wide and 6 feet in depth. The underground structure contained a mix of sludge and soil. The concrete top of the structure was removed and the concrete was disposed of offsite as construction debris. The sludge and soil were sampled, analyzed, and characterized. It was found to contain VOCs. The soil/sludge and the concrete floor and sides of the structure were excavated, loaded into trucks, and disposed of offsite as solvent contaminated, hazardous material. The final excavation extended approximately 9 feet below grade, the approximate depth to water.

# 3.1.2 Materials Disposed Offsite

Approximately 91 tons of soil and concrete were disposed offsite. The materials were disposed as metals and solvent contaminated, hazardous material with EPA waste codes D006, D007, and F002.

# 3.1.3 Site Restoration

The excavation was backfilled with approximately 80 cubic yards of clean sand. The top two feet of the excavated area was filled with clean compacted RCA blend. The excavated area was paved with asphalt.

# 3.1.4 Manifests

The disposal manifests are included in Appendix F of the "Underground Structure Investigation and Soil Excavation Report, November 2003."

# 3.1.5 Drawings

The drawings of the structure and soil excavation area are presented in the "Underground Structure Investigation Work Plan, October 2002" and the "Underground Structure Investigation and Soil Excavation Report, November 2003".

# **3.2 Operable Unit 1 – Soil Vapor Extraction System**

#### 3.2.1 Summary

In March of 2003, NYSDEC separated the SHI site remediation into two operable units. Operable Unit 1 (OU-1) was defined to address unsaturated soil and soil gas. A soil vapor extraction (SVE) system was approved by NYSDEC for the OU-1 remedy. The objective of the SVE system is to control migration of soil gas and reduce VOC concentrations in shallow, unsaturated soil to below NYSDEC soil cleanup objectives. The "Operable Unit 1 – Final Remedial Action Work Plan, July 2003" describes the construction of the SVE system. An electronic copy of the work plan is provided in Appendix B. The installation was completed in October 2003 and the system has been operational since that time.

#### 3.2.2 Design Changes

The "Operable Unit 1 – Final Remedial Action Work Plan" specified the installation of two Carbtrol G-4 units capable of holding 1,000 lbs. of carbon each. Two larger Carbtrol units capable of holding 2,000 lbs. of carbon each were installed to decrease the frequency of carbon change-out.

#### 3.2.3 Materials Disposed Offsite

Installation of the onsite SVE and the performance monitoring wells using a hollow stem auger generated contaminated soil cuttings. The soil cuttings generated during the SVE, air sparge and performance monitoring well installations were containerized in 55-gallon drums. A composite sample of the soil was collected, analyzed, and used to characterize the soil. A total of 45 drums of soil contained solvents and chromium with EPA waste codes D007 and F002 were shipped for offsite for disposal on April 20, 2005. The manifest for the disposal of the soil cuttings is provided in Appendix C.

# 3.2.4 Remediation Standards

The objective of the SVE system to capture the VOCs in the unsaturated zone onsite and to minimize impacts to indoor air quality both onsite and offsite.

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## 3.2.5 Site Restoration Activities

A 2 feet wide trench was excavated in the SHI parking lot to install the piping for the SVE system. The soil removed during the trench work was used to backfill the excavated area. A layer of clean RCA was placed over the trenched area and compacted to prepare the asphalt pavement. The trenched area was paved to restore the parking lot to original conditions.

# 3.2.6 Manifests

The manifest for the soil cuttings disposed of offsite is provided in Appendix C.

# 3.2.7 Drawings

The "As-Built" drawings and figures of the SVE, and Air Sparge systems, including the sparge and vent wells, equipment and controls, and manufacturers' manuals are provided in Appendix D, Drawing No. 3. The SVE system area of influence, based on current manifold vacuum pressures and flow rates measured from designated monitoring points, performance monitoring wells and monitoring wells is shown in Appendix D, Drawing No. 5

# 3.3 Operable Unit 2 – Air Sparge System

#### 3.3.1 Summary

In March 2003, NYSDEC separated the SHI site remediation into two operable units. As described in Section 3.2, the OU-1 remedy was designed to address unsaturated soil and soil gas. The objective of Operable Unit 2 (OU-2) is to remediate VOCs in groundwater. OU-2 is broken down into two treatment systems, air sparging shallow and intermediate depths in groundwater and in-situ bioremediation for deep groundwater. The bioremediation portion of the treatment system is addressed in Section 3.4. The OU-2 remedial construction is detailed in the NYSDEC approved "Operable Unit 2, Air Sparge System Remedial Action Work Plan, April 2005" provided in electronic format in Appendix B.

The air sparge (AS) system was designed to address VOCs in groundwater to depths of approximately 70 feet below grade. Two wells were installed at each sparge location. One well is screened at approximately between 68 and 70 feet below grade and the second well is screened at approximately between 43 and 45 feet below grade. The air supply to each set of wells (shallow and deep) can be individually controlled. The approximate air flowrate to the deep wells ranges from 7 to 10 cfm and the flowrate ranges from 8 to 10 cfm to the shallow wells. Two shallow wells and two deep wells run concurrently and pulse over a set cycle time (presently 45 minutes).

The remedial design objective of the AS wells is to inject air under pressure below the water table and volatilize VOCs dissolved in groundwater to the vapor phase. Vapor phase VOCs in the unsaturated soils above the water table will be captured and removed by the SVE system. The AS system is interlocked with the SVE system and will not operate, if the SVE system is not running with vacuum detected.

Construction of the AS system was completed in April 2006. The AS system presently runs each set of wells at 45 minutes per cycle, and runs 3 cycles of all of the wells per day.

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#### 3.3.2 Design Changes

The air sparge well spacing was adjusted during construction based on field conditions. Wells originally designated AS-9S and AS-9D could not be safely drilled at the southeast corner of the property because of the presence of underground utilities in the area. Well spacing to the adjacent cluster AS-8S and AS-8D was modified, as reported to NYSDEC, to achieve the radius of influence in accordance with the approved OU2 Work Plan.

The AS system was initially designed to operate with the intent to run one deep and one shallow sparge well at a time. A 5-hp Airtech SDU series compressor was initially selected to provide airflow to the air sparge wells. The design was changed upon NYSDEC request to run two sets of wells at a time. The system now includes two 5-hp Powerex compressors to permit the concurrent operation of two deep wells and one 5–hp Becker compressor to permit the concurrent operation of two shallow wells. The manufacturers' product detail information for the new compressors can be found in Appendix D.

Hour meters are used track the running time that each AS well is operated. The hour meters were designed to be controlled by flow detectors based on airflow to the sparge wells. The meters did not work properly during system startup. The hour meters would not properly turn off due to the residual air pressure in the AS piping. The hour meters were rewired to operate upon the activation of the airflow solenoid valves. When the solenoid valve for airflow to a sparge well opens, the hour meter is activated and tracks the running time. Updated control diagrams are included in Appendix D.

#### 3.3.3 Materials Disposed Offsite

The soil cuttings generated during installation of the SVE wells, nested air sparge wells and performance monitoring wells were containerized in 55-gallon drums. A composite sample of the soil was collected, analyzed, and used to characterize the soil. A total of 45 drums of soil containing solvents and chromium with EPA waste codes D007 and F002

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were shipped offsite for disposal on April 20, 2005. The soil cuttings generated during the installation of the two angular drilled air sparge wells were placed in 55-gallon drums. A total of 30 drums of soil cuttings were generated during the angular drilling. The cuttings were disposed of as soil containing solvents and chromium with EPA waste codes D007 and F002 were shipped offsite for disposal. The manifests for the soil cuttings are provided in Appendix C.

# 3.3.4 Remediation Standards

The objectives of Operable Unit 2 are to remediate VOCs in on-site groundwater and to remediate off-site groundwater by minimizing the off-site migration of VOCs originating from on-site VOC sources. The remedial design objective will be achieved through the following:

- The installation and operation of the AS system to remediate VOCs at shallow and intermediate depths in on-site groundwater and to minimize the off-site migration of VOCs at shallow and intermediate depths in groundwater.
- 2. *In-situ* bioremediation pilot test to evaluate the effectiveness of the bioremediation system in reducing concentrations of VOCs in on-site groundwater and to minimize off-site migration of VOCs to a depth of approximately 85 feet in groundwater. If successful, the pilot study would be followed by a full-scale application of the bioremediation material.
- 3. Groundwater sampling and analyses of the monitoring well network onsite and offsite to track groundwater quality onsite, up gradient, and down gradient of the site.
- 4. The AS/SVE remedy will remove VOCs from soil and thereby eliminate potential on-site and off-site exposure pathways from the soil gas. Engineering and institutional controls as described in Section 4.0 will be a component of the remedy.

The off-site investigation conducted between September 2002 and November 2002 found significant VOC concentrations in groundwater north and immediately up gradient of the SHI site. The results were reported in "January 2003, Draft Off-site Investigation Report". Sampling and analyses of up gradient groundwater samples obtained during the off-site investigation found VOCs at concentrations greater than the concentrations of VOCs historically detected in groundwater at SHI, and it indicates the presence of an up gradient, off-site source. The presence of VOCs in up gradient groundwater will impact the objective and the endpoint of the proposed on-site remediation, because the VOCs will continue to migrate from the off-site source to the SHI site, and contaminate the shallow groundwater at SHI. The discovery of the up gradient contamination indicates that the off-site VOCs are migrating in groundwater and are commingling with on-site VOCs, and increasing the overall concentrations of VOCs at the SHI site. The remediation standards will be dependent on the up gradient groundwater quality. Determination of when the system has achieved the remedial design objectives will be based on groundwater sampling and analysis of monitoring wells MW-3S, MW-3I, MW-4 & MW-6I and the performance monitoring wells to meet applicable groundwater standards (Class GA) in 6NYCRR Part 703, groundwater standards in Subpart 5-1 of Section 225 of the Public Health Law, draft Voluntary Cleanup Program guidance values, and/or to up gradient groundwater quality. The groundwater sampling and analyses program is described in the OM&M Plan provided in Appendix A.

#### 3.3.5 Site Restoration Activities

A 2 feet wide trench was excavated in the northeast area of the SHI parking lot to install additional AS system piping. The soil removed during the trenching was used to backfill the excavated area. A layer of clean RCA was placed over the trench to prepare a base for asphalt. The trenched area was paved to restore the parking lot to preexisting conditions.

#### 3.3.6 Manifests

The manifests for the soil cuttings disposed of off-site are provided in Appendix C.

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# 3.3.7 Drawings

The "As-Built" drawings and figures of the SVE, and Air Sparge systems, including the sparge and vent wells, equipment and controls, and manufacturers' manuals are provided in Appendix D.

# 3.3.8 Groundwater Flow Conditions

The most recent groundwater flow map based on the July 2006 data is provided in Appendix E. The groundwater flow direction is to the south-southwest.

# 3.3.9 Contaminant Concentrations

The most recent onsite and offsite groundwater sampling was performed in July 2006 The groundwater sampling results from July 2006 are provided in Appendix F. A groundwater plume map, showing on-site, total VOC concentrations is presented in Appendix D, Drawing No. 6. The plume map was prepared based on the July 2006 groundwater sampling data, aquifer profile groundwater data collected during the removal of the former underground structure in 2003, subsurface lithology data and geophysical data collected from onsite aquifer profile numbers AP-1, AP-2, AP-3 and AP-7 and geophysical data collected from the construction of performance monitoring well PMW-4.

# **3.4 Bioremediation Pilot Test**

#### 3.4.1 Summary

The onsite groundwater remediation at the SHI site includes two separate components. The air sparge system was designed to treat VOC contaminated groundwater to approximately 70 feet below grade. The onsite and offsite investigations show the VOCs in groundwater are present to a depth of approximately 85 feet below grade where a clay layer has been found. Hydrogen Release Compound (HRC) was injected in groundwater to minimize the migration of VOCs in groundwater from 70 to 85 feet below grade.

The details of the HRC pilot test injection work are described in the NYSDEC-approved "Operable Unit 2, Air Sparge System Remedial Action Work Plan, April 2005", provided in electronic format in Appendix B. The HRC was injected in October 2005. Approximately 1,200 pounds of HRC were injected at 10 locations. The injection locations are shown in Appendix D, Drawing No. 4.

Groundwater monitoring is in place as approved in the Work Plan to track the effectiveness of the pilot test work. The need for any additional work will be determined upon completion of the NYSDEC approved pilot test monitoring program. The pilot test results will be reported to NYSDEC in March 2007, as described in the NYSDEC approved Work Plan.

# 4.0 ENGINEERING AND INSTITUTIONAL CONTROLS

Engineering and Institutional Controls (EC/IC) are a component of the site remedy, and in accordance with the November 1, 2004 NYSDEC approval of "Operable Unit 2, Air Sparge System Remedial Action Work Plan", a Site Management Plan (SMP) will be prepared upon submittal of this Final Engineering Report.

The SMP will include the EC/IC, Soil Management Plan (SMP), Operation and Maintenance Plans (O&M) for the SVE and the AS systems, a Monitoring Plan, and annual reporting and certification. The SMP will address the following requirements:

- Restriction of the site to the existing or similar industrial/light uses or commercial uses, as allowed by local zoning, and specifically prohibiting the use of the site for residential, daycare, or medical uses. Alternative future site uses may be approved by NYSDEC.
- Restriction of the use of on-site groundwater for any purpose without adequate treatment and prior NYSDEC consent
- Operation and Maintenance of the AS/SVE systems to remediate the site and operation of the SVE to prevent impacts to indoor air quality both on and offsite.
- Maintenance of the asphalt pavement and building floor slabs
- A Soil Management Plan to address future excavation of soil
- Deed restriction or environmental easement for EC/IC
- Annual certification that EC/ICs are in place.

# 5.0 OPERATING, MONITORING, AND MAINTENANCE PLAN

The revised Operation, Monitoring and Maintenance Plans for OU-1 and OU-2, including the groundwater monitoring program for onsite and offsite, are provided in Appendix A.

# **6.0 CERTIFICATION**

# **Professional Engineer's Certification:**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete.



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# <u>Appendix A</u>

Operation, Monitoring and Maintenance Plans

# **OPERABLE UNITS 1& 2**

# SOIL VAPOR EXTRACTION & AIR SPARGE SYSTEM

# **OPERATION, MONITORING AND MAINTENANCE PLAN**

SID HARVEY INDUSTRIES, INC.

Valley Stream, New York

Voluntary Cleanup Project, Number V-00145-1

March 2007 Revision

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# **APPENDICES**

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### **1.0 INTRODUCTION**

The investigation and remediation process at Sid Harvey Industries, Inc. (SHI), Valley Stream, New York (site) is regulated and approved by the New York State Department of Environmental Conservation (NYSDEC) in accordance with the terms of the Voluntary Cleanup Agreement dated September 9, 1998 in place between NYSDEC and SHI. The agreement stipulates the steps necessary to implement and complete the phased investigation and remediation of the site.

The remediation system consists of a Soil Vapor Extraction (SVE) / Air Sparge (AS) remedial alternative supplemented with injection in groundwater of HRC, a reducing chemical, to address onsite groundwater contamination. The pilot test performed on the SVE / AS system confirmed the effectiveness of the proposed remedial SVE/AS technology. Additional testing of the HRC is underway. The site remediation program was divided into two operable units to enable the design, installation, and start-up of the SVE system to be implemented separately from the groundwater remedy. Operable Unit 1 (OU1) was defined to address unsaturated soil and soil gas. Operable Unit 2 (OU2) was defined to address saturated soil and groundwater. The SVE system was the remedy selected for OU1 and was constructed in 2003. The AS system was the selected remedy for OU2.

The remedial design information for the SVE system is presented in the "July 2003, Operable Unit 1 Remedial Action Work Plan" (OU1 RAWP). The SVE remediation system is designed to remediate VOCs in shallow unsaturated source area soil and control migration of soil gas. The remedial design information for the AS and HRC system is presented in the "April 2005, Operable Unit 2 Remedial Action Work Plan" (OU2 RAWP). The remedial objective of the AS system is to address VOCs in shallow source area groundwater and shallow on-site groundwater from the water table to approximately 70 feet below grade. The system will also minimize off-site migration of VOCs in shallow groundwater. The HRC will be injected to remediate VOCs in groundwater at approximately 70 to 85 feet below grade.

This " Operable Unit 1 & 2 Operation, Monitoring and Maintenance Plan" (OU2 OM&M) was

prepared in accordance with the OU2 RAWP and the objectives of this plan are summarized as follows:

- 1. Operate, monitor and maintain the operation of the SVE/AS remediation system.
- 2. Describe the components of the groundwater and air monitoring program presented in the Air Sparge System/Soil Vapor Extraction System Groundwater and Air Monitoring Plan.
- 3. Determine when the remediation goals have been met and the SVE/AS system can be shut down.

Section 2 of this OM&M plan provides a site description including site location. The site remediation system is described in Section 3. Section 4 presents the sampling and analyses to be performed. Section 5 describes the site maintenance and inspections. The reports to be prepared for sampling, analyses and inspections are described in Section 6.

## 2.0 SITE DESCRIPTION

#### 2.1 Site Location

Sid Harvey Industries, Inc. is located in Valley Stream, New York as shown on Figure 1.

## 2.2 Site History

SHI operated a manufacturing facility at 100 East Mineola Avenue, Valley Stream, New York. The plant operated 8 hours per day, 5 days a week until July 2006, when it ceased production. SHI reconditioned and rebuilt pumps, motors and controls for oil-fired boilers at the plant. Concentrated spent aqueous cleaners and chemicals were generated in the rebuilding operations and were drummed and stored in an outdoor drum storage building at the west side of the facility. SHI shipped the drummed hazardous waste to off-site, permitted treatment, storage and/or disposal facilities (TSD).

#### **3.0 REMEDIAL ACTION**

The SVE/AS remediation system is designed to address VOCs in source area soil, to control migration of soil gas, to remove VOCs from groundwater, and to capture VOCs in the vadose zone generated by air sparged to groundwater by the AS system. The AS system is designed to remediate groundwater to approximately 70 feet below grade and to minimize off-site migration of VOCs in groundwater. Air will be injected under pressure below the water table. The injected air will contact and remove the dissolved phase VOCs in groundwater. The VOCs removed from the groundwater will migrate to the soil column above the water table and will be captured and removed by the soil vapor extraction system (SVE).

The SVE wells and vacuum blower are the key components of the SVE system. The location and construction details of the SVE system are shown in the OU1 RAWP and the "As Built" drawings and figures. The AS wells and compressor are the key components of the AS system. The location and construction details of the SVE and AS system are shown in the OU2 RAWP and the "As Built" drawings and figures.

#### 3.1 Groundwater Monitoring

The groundwater monitoring component of the SVE/AS remedy consists of collecting groundwater samples at the on-site monitoring wells and performance monitoring wells. Well construction details are provided in the Site Investigation Report and the location of the wells are shown on Drawing 1 of the OU2 RAWP.

Two additional monitoring wells (PMW-3 and PMW-4) were installed as part of the OU2 remedy to monitor the performance of the air sparge system. The wells are screened at 35 feet below land surface and 51 feet below land surface respectively. The well locations and well construction details are shown in the OU-2 RAWP. The groundwater monitoring component of the AS system is presented in the Air Sparge System Groundwater and Air Monitoring Plan provided in Appendix A.

## 3.2 Air Monitoring

The air monitoring component of the AS remedy will consist of collecting air samples at the permanent soil vapor monitoring points, performance monitoring wells, monitoring wells, SVE wells, at the vacuum blower exhaust, between the air pollution control equipment, carbon vessels and at the discharge of the air pollution control equipment. The air monitoring sampling locations are shown in Drawing 1 and in Figure 9 of the OU-2 RAWP. The subsurface vapor pressure will be monitored to verify that negative pressure is achieved at the designed radius of influence and that soil gas migration is controlled. The soil vapor monitoring and vapor point construction details are provided in Figure 1 and Figure 2 of the OU1 OM&M.

The air monitoring component of the AS system is presented in the Air Sparge System Groundwater and Air Monitoring Plan provided (Appendix A).

## 4.0 SAMPLING AND ANALYSIS

#### 4.1 Groundwater and Air Monitoring

This section describes the operation, maintenance and monitoring of the groundwater and air sampling and analysis component. The groundwater and air sampling and analysis is presented in the Air Sparge System Groundwater and Air Monitoring Plan (Appendix A). The groundwater and air sampling and analysis will track the effectiveness of the AS system in achieving the remedial goals.

The quality assurance project plan, sampling schedule, and analytical methods for the groundwater and air sampling program are described in the Air Sparge System Groundwater and Air Monitoring Plan.

#### 5.0 SITE OPERATION, MAINTENANCE AND INSPECTION

#### 5.1 Site Management

NAC CONSULTANTS, INC. (NAC) will perform field activities such as sample collection, and oversee the monitoring and maintenance of the remediation system.

5.2 Soil Vapor Extraction (SVE) and Air Sparge System (AS) Operation and Maintenance

#### 5.2.1 SVE/AS System Description

The SVE/AS system is designed to remediate VOCs in groundwater by injecting air below the water table and capturing the VOCs stripped from groundwater in the unsaturated soil column above the water table. The AS system operates by injecting compressed air below the water table at the sparge wells. The sparged air contacts and removes the dissolved phase VOCs in groundwater. The VOCs are captured by the SVE system in the vapor phase in the soil column above the water table. The sparge air is injected at two shallow sparge wells and two deep sparge wells at a time with a flow rate of approximately 10 cfm per well, under positive pressure developed by compressors. The sparge air compressors are installed in the fenced equipment storage shed area at the north side of the former Cleaning Department adjacent to the SVE equipment shed. Underground piping connects each AS well to the equipment area where the piping is manifolded and connected to respective shallow and deep well compressor. There are 11 deep sparge wells and 9 shallow sparge wells.

The VOCs in the unsaturated soils above the water table are captured and removed by one or more of the seven vent wells (SVE-1, SVE-2, SVE-3, SVE-3A, SVE-4, SVE-5 or SVE-6) under negative pressure developed by a vacuum blower. The vacuum blower is located in the fenced equipment storage area at the north side of the former Cleaning Department. Underground piping is connected from each SVE well to the equipment area, where the piping is manifolded and connected to the vacuum blower.

The SVE system can be operated without the AS system to control soil gas migration. The AS system operation is electronically interlocked to the SVE system. The AS system cannot be operated unless the SVE is on, and vacuum is detected. The purpose of the interlock is to ensure that the AS system does not generate VOCs that migrate to the unsaturated soil column above the water table without the soil vapor extraction system on line to capture the vapors for removal and treatment.

Air flow control valves are installed on the AS well piping in the equipment shed. The piping and valves and are labeled. Controls and alarms monitor the AS compressor operation, air flow, pressure, and malfunctions.

Flow control valves for the vacuum system are located on the SVE well piping adjacent to the equipment in the shed. The piping and valves connected to each of the soil gas vent wells are labeled. Controls and alarms monitor the SVE blower operation, flow and pressure, and malfunctions.

The system "As-Built" figures and Drawings are provided in Appendix C of the "March 2007, Final Engineering Report" and show the major equipment layouts, the piping, the electrical controls and instrumentation.

#### **5.3 Maintenance Activities**

#### 5.3.1 Site Access and Security

The remediation system area is enclosed in a locked fenced area located on the site. The fence, chain and lock will be inspected for vandalism upon each visit to the site.

The site is accessible from East Mineola Avenue from the north and East Valley Stream Boulevard from the south. A padlocked swing gate exists to prevent unauthorized access to the east driveway where the AS wells are located.

#### 5.3.2 Gas Venting System Maintenance

A photoionization air monitor (PID) will be used to screen air quality during routine maintenance. The pipe fittings to the vapor phase granulated activated carbon (VGAC) vessel will be checked for leaks with a PID. The PID will also be used to measure VOCs in the treated air at the stack. VOC detections (leaks) will recorded and corrective measures will be taken accordingly. Specifications for the PID and other portable instruments used for operation, monitoring, and maintenance activities are provided in Appendix A-4 of the Air Sparge System Groundwater and Air Monitoring Plan.

#### 5.3.3 Treatment Area Maintenance

The structures and fencing in and around the equipment will be inspected for damage and/or vandalism upon visiting the site. All security devices (locks) will be inspected for tampering. Periodic maintenance will be performed, as needed.

## 5.3.4 Preventative Maintenance Schedules and Records

A maintenance plan is the most reliable way to minimize repairs and maximize system efficiency. System specific maintenance activities include motor and mechanical equipment lubrication and system checks. Maintenance will be provided in accord with equipment manufacturers recommendations and/or good practice. All maintenance services will be recorded in a service log and kept on-site for reference. Original logs will be maintained by **NAC**. Typical forms that will be used for operation and maintenance tracking are listed below and presented in Appendix B:

- Inspection & Maintenance Checklist
- System Operation Log
- Defective Equipment & Repair Log
- Corrective Action Log
- Replacement Part Log

# 5.3.5 Waste Disposal Requirements

The operation of the treatment system is not expected to generate hazardous waste other than trace concentrations of VOCs in the discharge effluent and spent carbon from the vapor-phase granulated activated carbon treatment. The waste will be characterized and shipped off-site for disposal in accord with State and Federal solid waste regulations.

Air samples collected between the primary and secondary VGAC units will be used to determine when to change out the carbon in the primary unit.

Moisture removed in the knockout vessel / drum will either be pumped through granulated activated carbon (GAC) and discharged to the POTW in accordance with the Nassau County Sewer Ordinance, or characterized and disposed of in accordance with Federal, State and local regulations.

## 5.3.7 Inspection Schedule and Requirements

Treatment system components and structures will be periodically inspected to ensure proper and efficient operation. System specific inspection tasks include VOC screening, leak detection, basic system adjustments, flow rates and pressure readings.

Basic inspection tasks will be conducted by **NAC** personnel, and only skilled personnel will perform maintenance tasks. Such tasks may require the operator(s) to have proper licenses and credentials prior to performing work.

### 5.4 Treatment System Equipment, Operation, and Objectives

#### 5.4.1 System Equipment and Operation

Three 5-HP compressors, one for the shallow air sparge wells and two for the deep air sparge wells, capable of delivering 23 cfm @ 50 psi per compressor will concurrently provide the air to the sparge wells. Two shallow sparge wells and two deep sparge wells will be alternately operated (pulsed) at a time for 45 minute intervals at a flow rate of approximately10 cfm per well. The AS system will not run between the hours of 12:00am and 4:00am, to minimize noise. The pulse frequency may be adjusted over time based on sampling results.

The AS system air supply valve controllers are programmed to sparge two shallow wells and two deep wells simultaneously for 45 minutes. There is a separate controller for the deep and shallow wells. The system will cycle to the next programmed set of shallow and deep wells and sparge the wells for 45 minutes. Once the sparge cycle is complete the system will restart the sparge cycle, beginning with the initial shallow and deep wells. The running time for each sparge well is totaled on the hour meter connected to each well air supply.

Portable instrumentation to be used to operate and optimize the system include a photoionization detector (PID), vacuum / pressure meter, dissolved oxygen / pH / temperature multi meter, and a water level probe. AS system instrumentation includes controls and alarms to monitor the AS compressor air flow and pressure, and malfunctions. The control layout and the schematic ("ladder") diagram are shown in the AS system details in Appendix C of the OU2 RAWP.

There are 7 soil vapor extraction wells installed at the site. Wells SVE-1 through SVE-6 were installed upon NYSDEC approval of the OU-1 RAWP. Well SVE-3A was added to the system in December 2006 in the former Cleaning Department upon excavation and removal of soil pursuant to the facility's closure. Well SVE-3 is installed in the backfill in a polyethylene lined area where soil was removed and well SVE-3A was installed outside the polyethylene lined area in the soil that

could not be removed at the time of facility closure. Wells SVE-3 and SVE-3A are interconnected with aboveground piping and separate valves for each wells. The piping connecting wells SVE-1 through SVE-6 to the vacuum blower equipment is manifolded at the equipment shed and where the valves to control the vacuum flow to each well (SVE-1 through SVE-6) are located. The sampling tap for each well SVE-1 through SVE-6 is also located at the equipment shed. The location of the equipment storage area, piping layout, connection details of the wells to the piping, general equipment layout, and trench cross-section diagrams are shown in the "As-Built" drawings in Appendix C of the "March 2007, Final Engineering Report."

A centrifugal, explosion proof, vacuum blower rated at 6.2-HP and capable of delivering 265 cfm (a) 11 inches we recovers the vapors at the SVE wells. The SVE system runs continuously and has the capacity to influence the entire area of concern and under the building simultaneously. Moisture recovered with the soil gas is removed in a knockout drum equipped with a high liquid level shut off in the equipment shed. Moisture removed in the knockout drum or tank is either pumped through a granulated activated carbon (GAC) drum or characterized and disposed of off-site in accordance with Federal, State and local regulations.

Controls and alarms are installed to monitor the SVE blower flow and pressure, and malfunctions. The controls layout, including the ladder diagram are shown in the SVE system details in Appendix A of the OU1 RAWP.

The VOC emissions of the SVE system are treated in 2 Carbtrol containing 2,000 lbs. of carbon each at the equipment storage area. The VGAC units are installed in a lead and lag configuration and vapor samples collected between the lead and lag VGAC units are used to determine when to change out the carbon. The treated air is discharged through a stack installed above the building roof elevation. Air samples will be collected at the inlet to the lead VGAC unit, between the lead and lag VGAC units and at the air discharge of the lag VGAC unit. The analytical results of air samples collected from the VGAC system will be compared to Air Guide 1 concentrations and/or emissions limits set by NYSDEC.

Portable instrumentation to be used to operate / optimize the system include a photoionization detector (PID), vacuum / pressure meter, dissolved oxygen / pH / temperature multi meter, and a water level probe. SVE system instrumentation includes controls and alarms to monitor the SVE blower air flow and pressure, and malfunctions. The controls type and layout, including the ladder diagram are shown in the SVE system details in the OU1 RAWP.

Changes in VOC mass in soil vapor will be compared at each monitoring location and will be reviewed in light of regional background upgradient concentrations. This information will be complied and reported to NYSDEC, with recommendations for system adjustments including frequency, vent locations, and air flow rates. The data will be mapped, as needed on a concentration or mass basis.

#### 5.4.2 System Remedial Objectives

The remedial objective of the SVE/AS system is to reduce VOCs concentrations in shallow unsaturated source area soil and shallow onsite groundwater while controlling migration of soil gas.

Determination that the system is able to control migration of soil gas has been completed based on vacuum pressure monitoring of wells MP-1, MP-2, MP-5, MP-6 and PMW-1. Data revealed a 0.1 inches of water vacuum radius of approximately 90' at 70 inches of applied vacuum. A drawing depicting this "area of influence" is provided in Appendix C of the March 2007, Final Engineering Report.

Determination that the remedial objective to reduce VOC concentrations in shallow unsaturated source area soil will be based on air sampling of wells SVE-3 and SVE-5 and soil samples collected in the vicinity of shallow unsaturated source area soils. Concentrations of VOCs in soil vapor, vacuum and pressure readings, and PID readings will be tabulated and graphed by monitoring location and compared based on air flow rates and time. The mass of VOCs removed in the vapor

phase will be calculated using the vacuum blower exhaust flow rate and the VOC concentrations determined by laboratory analyses.

Determination that the remedial objective of the system to address VOCs in shallow source area groundwater and shallow on-site groundwater from the water table to approximately 70 feet below grade will be based on groundwater sampling and analyses of monitoring wells MW-3S, MW-3I, MW-4, MW-6I, and the performance monitoring wells. The objective will be met when groundwater sampling and analyses of the monitoring and performance monitoring wells show that the groundwater concentrations of VOCs meet applicable groundwater standards (Class GA) in 6NYCRR Part 703, groundwater standards in Subpart 5-1 of Section 225 of the Public Health Law, draft Voluntary Cleanup Program guidance values, and/or upgradient groundwater quality.

Concentrations of VOCs in groundwater will be tabulated and graphed by monitoring well location and compared over on time. The mass of VOCs removed in the dissolved phase will be calculated using the VOC concentrations determined by laboratory analyses. The groundwater sampling results will be compared to NYSDEC groundwater standards (Class GA) in 6NYCRR Part 703, groundwater standards in Subpart 5-1 of Section 225 of the Public Health Law, draft Voluntary Cleanup Program guidance values, and/or to upgradient groundwater quality.

# 5.5 Health and Safety

A Health and Safety Plan (HASP) for the well construction and sampling work was developed to address the protection of **NAC** workers and public health and safety; and to respond to contingencies that could impact public health, safety and the environment. The HASP shall satisfy the requirements of the "Occupational Safety and Health Guidance for Hazardous Waste Site Activities", (October 1985, DHH 5 NIOSH Publication No. 85-115), and the Occupational Safety and Health Administration, U.S. Department of Labor ("OSHA") requirements cited below. Site activities such as inspection and investigation activities shall be performed to ensure the safety and health of personnel and shall be conducted in accordance with the pertinent general industry (29 CFR 1910)

and construction (29 CFR 1926) OSHA standards, as well as any other applicable State and municipal codes or ordinances. All site activities shall comply with those requirements set forth in OSHA's regulations "Hazardous Waste Operations and Emergency Response", 29 CFR 1910.120, Subpart H. The HASP is included in Appendix C.
### 6.0 SAMPLING, ANALYSIS & INSPECTION REPORTS

### 6.1 Groundwater Sampling, Analysis, and Monitoring Well Inspections

Reports of sampling, analysis and inspections are addressed in the Air Sparge System Groundwater and Air Monitoring Plan (Appendix A).

### **6.2 Treatment System and Site Inspections**

Treatment system and site inspections will be presented in quarterly monitoring reports. Monthly performance monitoring reports will be submitted initially. Once mass removal rates have stabilized, the frequency of reporting may be reduced upon NYSDEC approval.



### <u>Appendix A</u>

Air Sparge System Groundwater and Air Monitoring Plan

### SOIL VAPOR EXTRACTION/AIR SPARGE SYSTEM GROUNDWATER AND AIR MONITORING PLAN

### SID HARVEY INDUSTRIES, INC.

Valley Stream, New York

Voluntary Cleanup Project, Number V-00145-1

March 2007 Revision

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### **1.0 INTRODUCTION**

The investigation and remediation process at Sid Harvey Industries, Inc. (SHI), Valley Stream, New York (site) is regulated and approved by the New York State Department of Environmental Conservation (NYSDEC) in accordance with the terms of the Voluntary Cleanup Agreement dated September 9, 1998 in place between NYSDEC and SHI. The agreement stipulates the steps necessary to implement and complete the phased investigation and remediation of the site.

The remediation system for the SHI site consists of two components; Operable unit 1 (OU1) to address unsaturated soil and soil gas and operable unit 2 (OU2) to address saturated soil and groundwater. The SVE system is the selected remedy for OU1 and was constructed in 2003. The remedial objective of OU2, the AS system, is to address VOCs in groundwater and shallow on-site groundwater from the water table to approximately 70 feet below grade. The system will also minimize off-site migration of VOCs in groundwater.

The remedial design information for the SVE system is presented in the OU1 RAWP. An OU1 Draft Operation, Monitoring and Maintenance Plan, April 2003 (OU1 OM&M) was prepared in accordance with the OU1 RAWP. The OM&M describes the operation, monitoring and maintenance of the SVE system equipment, the components of the groundwater and air monitoring program, and defines the remediation goals of the SVE system.

The remedial design information for the AS system is presented in the "Operable Unit 2 Remedial Action Work Plan, April 2005 (OU2 RAWP)." The OU2 Draft Operation, Monitoring and Maintenance Plan, April 2005 (OU2 OM&M), prepared in accordance with the OU2 RAWP, describes the operation, monitoring and maintenance of the AS system equipment, the components of the groundwater and air monitoring program, and defines the remediation goals of the AS system.

The purpose of this Soil Vapor Extraction System Groundwater and Air Monitoring Plan is to gage

the effectiveness of the AS system in achieving the remedial goals. This plan also presents the quality assurance project plan, sampling schedule, and analytical methods for the groundwater and air sampling program.

### 2.0 GROUNDWATER MONITORING WELLS AND AIR MONITORING POINTS

### 2.1 Groundwater Monitoring Wells

The groundwater monitoring wells that will be sampled include the on-site monitoring wells and performance monitoring wells.

### 2.2 Air Monitoring Points

The air monitoring component of the SVE remedy will consist of monitoring vacuum and pressure and screening for VOCs with a PID at the soil vapor monitoring points (implants), monitoring and performance monitoring wells, SVE wells, at the vacuum blower exhaust, and at the discharge of the air pollution control equipment. The locations of the soil vapor monitoring points are shown on Drawing 1 in the OU2 RAWP. The subsurface vapor pressure will be measured at the soil vapor monitoring points to verify that negative pressure is achieved at the designed radius of influence and that soil gas is being controlled.

The start-up / shake-down monitoring schedule will involve collecting air samples from site soil vapor monitoring points prior to system start-up to establish baseline conditions. Background air samples were collected during the soil gas survey in November 2002. The results of the soil gas survey are presented in the Off-site Investigation Report.

### 2.3 Onsite Indoor Air Quality Sampling Program

Pressure and vacuum readings will be collected from soil vapor monitoring points located under the SHI building slab to verify that negative pressure is achieved. The locations of the indoor soil vapor monitoring points are shown on Drawing 1 of the OU2 RAWP.

### 3.0 GROUNDWATER AND AIR MONITORING

### 3.1 Groundwater Monitoring

### 3.1.1 Sampling Procedures

Monitoring wells will be sampled in accordance with the groundwater sampling procedures provided are in Appendix A-1. A groundwater sampling checklist is also provided in Appendix A-2. Field parameters will be run for pH, temperature, conductivity, and dissolved oxygen to verify proper purging and sampling.

### 3.1.2 Monitoring Well Maintenance

The monitoring wells and field equipment must be maintained in good operating condition throughout the life of the remedy. As required by the OM&M regular field inspections of the monitoring facilities will be performed and standard reports on the integrity of the monitoring network. These reports include a Monitoring Well Inspection Checklist provided in Appendix A-2.

### 3.2 Air Monitoring

Soil vapor monitoring points will be sampled in accordance with the soil vapor monitoring point sampling procedures provided in Appendix A-3. Table 1-1 presents the sample points, methods, and frequency for air sampling throughout the life of the system. Field parameters will be run for photoionization detector (PID) readings and vacuum and pressure readings. Specifications for portable instruments used to measure field parameters are provided in Appendix A-4.

### 3.3 Laboratory Analysis

The groundwater and air samples will be analyzed at New York State Department of Health ELAP-

approved analytical laboratories. The groundwater samples will be analyzed for VOCs by Method 8260 by Ecotest Analytical Laboratories, Inc. in North Babylon, New York. The air samples will be analyzed for VOCs by Method TO+15 by Chemtech Environmental Laboratories in Mountainside, New Jersey.

### 3.4 Quality Assurance Project Plan

The quality assurance (QA) objective is to develop and implement procedures for sampling, laboratory analyses, field measurements, and reporting that will provide quality data consistent with it's intended use.

### 3.4.1 Quality Control

Field duplicates and trip blanks will be collected and submitted to the analytical laboratory to provide a means to assess the quality of the data resulting from the field sampling program. Field duplicate samples will be analyzed for sampling and analytical reproducibility. Trip blank samples will be analyzed to assess cross-contamination caused by VOC migration during shipment and storage. This QC effort will consist of one field duplicate for every sampling round. A trip blank will be included with each shipment of groundwater samples for VOC analyses. Deionized water used for trip blanks will be demonstrated analyte-free for parameters of interest by laboratory analysis.

### 3.4.2 Field Measurements

Measurement data will be generated during field activities that are incidental to collection of samples for analytical testing or unrelated to sampling. These activities include:

Documenting the time and weather conditions;

- Locating and determining the elevations of sampling stations;
- Determining well depth and static water level;

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•

- Verifying well development and pre-sampling purge volumes; and
- Measuring flow rates of groundwater and vapor sampling devices.

The general QA objective for this measurement data is to use standard procedures to obtain reproducible and comparable measurements at a degree of accuracy consistent with the intended use of the data.

Field measurements will be made in bound ledgers and sample documentation will conform with the standard sampling handling requirements.

### 3.4.3 Quality Control Requirements

Field quality control will be maintained during all field activities. All field quality control procedures will be carried out according to this Quality Assurance Project Plan and will be documented in bound ledgers.

### 3.4.3.1 Field Duplicates

One duplicate sample will be obtained for every sampling round. The duplicate sample will be collected by alternately filling two sets of sample bottles from the same sampling device for each set of parameters.

### 3.4.3.2 Field Blanks

One field blank will be obtained for every sampling event. The field blank will be collected by filling a set of sample bottles in the field with deionized water provided by the laboratory to verify proper decontamination of the sampling and/or purging equipment.

### 3.4.3.3 Trip Blanks

Each sample shipment containing aqueous samples for VOC analysis will contain one trip blank for VOC analysis. The trip blank will consist of two 40 ml VOA vials with laboratory grade distilled water, prepared by the laboratory, transported to the field, and shipped with the other samples to the laboratory without being opened.

### 4.0 SCHEDULE AND REPORTING

The groundwater monitoring program will begin following the SVE system startup. The air monitoring program will begin prior to system startup. Table 1-1 presents the sampling locations, methods, and frequency for groundwater and air sampling throughout the life of the system. The quarterly monitoring reports will also include mass removal documentation, graphs, and tables. The air monitoring program will begin prior to system startup. The quarterly monitoring reports will also include mass removal documentation, graphs, and tables. The air monitoring program will begin prior to system startup. The quarterly monitoring reports will also include mass removal documentation, graphs, and tables. Monthly performance monitoring reports will be submitted initially. Once mass removal rates have stabilized, the frequency of reporting may be reduced upon NYSDEC approval. Based upon the data collected during the first year of groundwater and air monitoring, the schedule may be decreased to semi-annually.

Monthly performance monitoring reports will be prepared and submitted to NYSDEC within four weeks following sample collection. The reports will include: 1) an overview of the system performance, 2) sampling procedures, 3) groundwater and air data interpretation, and 4) recommendations to improve system performance and enhance data collection. The monthly performance monitoring reports will also include mass removal documentation, graphs, and tables. A comprehensive annual report will be prepared to summarize and evaluate the performance monitoring reports and will include all raw and summarized field and laboratory data.

NAC CONSULTANTS, INC.

Sid Harvey Industries, Inc. Valley Stream, New York Table 1-1 Groundwater and Soil Vapor Sampling Program

### GROUNDWATER

Sampling Frequency	Source	Well Identification	Analyte and Analytical Method	Container	Field Parameters
Quarterly	On-Site Monitoring Wells	MW-1, MW-2, MW-3S, MW-31, MW-4, MW-5, MW-6I and MW-6D	VOCs via USEPA Method 8260	40 ml VOA with 1M HCL Preservative	Water Level, Temerature, Conductivity, pH and Dissolved Oxygen (DO)
Quarterly	Performance Monitoring Wells	PMW-1, PMW-2, PMW-3 and PMW-4	VOCs via USEPA Method 8260	40 ml VOA with 1M HCL Preservative	Water Level, Temerature, Conductivity, pH and Dissolved Oxygen (DO)
Semi-Annually	Off-Site Monitoring Wells	MW-7S, MW-7I, MW-7D, MW-8S, MW-8I, MW-8D, MW-9S, MW-9I, MW-9D, MW-10 and MW-11S	VOCs via USEPA Method 8260	40 ml VOA with 1M HCL Preservative	Water Level, Temerature, Conductivity, pH and Dissolved Oxygen (DO)

### SOIL VAPOR

Field Parameters	n/a	Vacuum / Pressure	n/a
Container	n/a	Summa Canister	n/a
Analyte and Analytical Method	VOC's (via Photoionization detection)	VOC's via USEPA Method TO+15	VOC's (via Photoionization detection)
Well/Location Identification	MP-1, MP-2, MP-5, MP-6, MP-7, MP- 8, SVE-1, SVE-2, SVE-3, SVE-4, SVE 5, SVE-6 and PMW-2 <sup>-1</sup>	SVE-1, SVE-2, SVE-3, SVE-4, SVE-5, SVE-6, Discharge to GAC System, Between Lag and Lead GAC Vessels and Discharge to Stack	MP-1, MP-2, MP-5, MP-6, MP-7, MP- 8, MW-2 and PMW-2 <sup>1</sup>
Source	Soil Vapor Monitoring Points, Soil Vapor Extraction Wells and Performance Monitoring Wells	Soil Vapor Extraction Wells and Vapor-Phase GAC System	Soil Vapor Monitoring Points, Monitoring Wells and Performance Monitoring Wells
Sampling Frequency	Prior to System Start-Up	Monthly to Quarterly	Monthly to Quarterly

1: Soil vapor monitoring points MP-3 and MP-4 were damaged during the installation of the air sparge system piping and site operations and were deleted from the soil vapor sampling program. NOTES:

Sid Harvey Industries, Inc. Valley Stream, New York Voluntary Cleanup Project, Number V-00145-1

### Appendix A-1 Groundwater Sampling Procedures

- (1) Upon arrival at each well site, enter well identification in field log notebook.
- (2) Place new plastic sheeting over and around the monitoring well so that a 5 x 5 foot clean surface is created for the sampling equipment. All materials, tools and equipment will be cleaned prior to placement on the plastic.
- (3) Clean the top of the well, remove well cap and place it on the plastic sheeting.
- (4) Screen the well opening for Volatile Organic Compounds (VOCs) using a photoionization detector. Record all readings in log book.
- (5) Measure the depth to water below the reference point (top of casing) using an electric water level indicator to the nearest 0.01 foot. Clean the measuring device with phosphate-free detergent and rinse with distilled water between measurements.
- (6) Calculate the volume of standing water in the 2-inch inside diameter (I.D.) by multiplying the linear feet of standing water in the well by 0.16.
- (7) Lower a multi-parameter water quality meter into the well, measure and record baseline dissolved oxygen, temperature, conductivity and pH readings into the log book.
- (8) Purge well with a submersible pump until at least three standing water volumes have been purged in accord with USEPA and NYSDEC protocols Calculate the flow rate of the purgewater from the pump discharge piping. The pumping rate must reach/exceed 0.5 liters per minute.

Note: Purge water will be containerized in 55 gallon drums and either be pumped through a granulated activated carbon (GAC) drum and discharged to the Nassau County sanitary sewer system or disposed of off-site in accordance with Federal, State, and local regulations.

- (9) Measure specific conductance, temperature and pH of the purgewaters at the discharge line at least once per each casing volume purged
- (10) Prepare sample bottles to receive samples.
- (11) Collect the sample using a polypropylene or polyethylene bailer. Immediately pour the sample into the sample bottles. Vials used for VOC samples will be filled with no headspace or air bubbles visible once capped.
- (12) Replace well cap and lock.

- (13) Rinse the pump with an alconox solution followed by a triple rinse of distilled water. Ensure that all decontamination waters/solutions are containerized a 55-gallon drum. Change-out and properly dispose of the used polyethlyene piping between sample collection at each well.
- (14) Discard plastic sheeting, and other expendable materials.
- (15) Place the samples on ice and deliver the samples to the receiving NYSDEC-approved analytical laboratory with chain of custody documentation.

C. Documents and Settings'Mike/Desktop/Revised OMandM\/OU2 OMandM\/Apendix A\/Appendix A Sampling Procedures.wpd

NAC CONSULTANTS, INC.

### Sid Harvey Industries, Inc. Valley Stream, New York Voluntary Cleanup Project, Number V-00145-1

### Appendix A-2 Monitoring Well Inspection and Groundwater Sampling Checklist

Monitoring Well ID:\_\_\_\_\_

Date:\_\_\_\_\_

Inspect the condition of the well protective cover or flush-mounted curb box. Note in log book and evident damage to the well box cover, damage to the screw-hole threads, missing cover screws and/or damage to the steel metal skirt and Buna-N Gasket.

Inspect the well cap for damage. Ensure that the locking plug has a secure seal. Inspect the locking device for tampering. Replace the locking plug and locking device if necessary.

Note conditions inside the well enclosure, such as standing water, damage and any obvious of contamination (oily sheen, staining, odors, etc.).

Place new plastic sheeting over and around the monitoring well so that a  $5 \times 5$  foot clean surface is used for the sampling equipment.

Measure the depth to water below the reference point (top of casing) using a chalked, steel tape or electric sensor to the nearest 0.01 foot.

Lower dissolved oxygen probe into the well and a few feet below the water level to collect *in situ* dissolved oxygen measurement.

Refer to the well depth and calculate the volume of standing water by multiplying the gallons per linear feet of 2 inch diameter pipe times height of standing water.

Purge well with submersible pump or suction pump until at least three standing water volumes have been purged.

Record the physical appearance and temperature of the purged groundwater.

Measure specific conductance, temperature and pH.

	Prepare sample bottles to receive samples.
	Immediately pour the sample into the respective sample bottles. Vials used for VOC samples must be filled with no headspace or air bubbles visible once capped.
	Pump purge water through a granulated activated carbon (GAC) drum and discharged to the Nassau County sanitary sewer system or dispose of off-site in accordance with Federal, State, and local regulations.
	Replace well cap and lock.
	Discard plastic sheeting and other expendable materials.
	Place the samples on ice and deliver the samples to the receiving NYSDEC-approved analytical laboratory with chain of custody documentation.
Comments_	

Note: Use the comment section to document the need for corrective actions and the date that the corrective actions are completed.

### Sid Harvey Industries, Inc. Valley Stream, New York Voluntary Cleanup Project, Number V-00145-1

### Appendix A-3 Soil Vapor Monitoring Point Sampling Procedures

- (1) Upon arrival at each soil vapor monitoring point, enter sample identification in field log notebook.
- (2) Place new plastic sheeting over and around the monitoring point so that a 5 x 5 foot clean surface is created for the sampling equipment. All materials, tools and equipment will be cleaned prior to placement on the plastic.
- (3) Clean the top of the curb box, remove lid and place it on the plastic sheeting (skip step three for sampling conducted at the vacuum blower exhaust and at the discharge of the air pollution control equipment).
- (4) Purge no more than one to two volumes of air with portable vacuum pump at a rate less than 0.2 l/min.
- (5) Attach Photoionization Detector (PID) to the end of the Teflon tubing and record reading in field log book.
- (6) Attach pressure meter to the end of the Teflon tubing and record reading in field log book.
- (7) Attach properly labeled Summa canister to the end of the Teflon tubing and open the canister valve. Close the valve after 1 hour of time has elapsed (<100 ml/min).
- (8) Discard plastic sheeting, and other expendable materials.
- (9) Samples will be brought to the laboratory with chain of custody documentation.

### Notes:

1. Air samples will not be collected at each sampling round with the Summa canister. The specific air sample collection frequency with the Summa canister is specified in Table 1-1 of the Soil Vapor Extraction System Groundwater and Air Monitoring Plan.

2. Vacuum/pressure readings will be collected first and prior to leaving the well or monitoring point open to the atmosphere.

3. The laboratory VOC detection limits should be 1  $\mu$ g/m<sup>3</sup> or less. The laboratory analyses shall report the VOCs in  $\mu$ g/m<sup>3</sup>.

### 2020



### 2020 Detectable Compounds

Aromatics - Benzene, Toluene, Naphthalene

Unsaturated Hydrocarbons -Acetylene, Ethylene, 1,3-Butadiene

Chlorinated Hydrocarbons - Vinyl Chloride, Chloroform, Trichloroethylene, Methylene Chloride

Ketomes - Acetone, Methyl Ethyl Ketone, Methyl Isobutyl Ketone

Alcohols - Methanol, Ethanol, Isopropanol, n-Butanol

Drganic fuels - Gasoline, jet fuels, etc. which are mixtures of hundreds of different compounds, including aromatics.

Please note: This list provides examples of the types of compounds detectable by the 2020. Please contact Photovac Technical Support for details on specific compound detection.

For further information on Photovac products, or to arrange a product demonstration, please contact a Photovac representative near you, email us at admin@photovac.com or contact Photovac, Inc.

### Specifications

### Size

25.4 cm (10") long, 7.6 cm ( 3") wide, 5 cm ( 2") high

Weight

0.8 kg (1.75 lbs.)

### Detector

Instant on photoionization detector with standard 10.6 eV UV lamp, optional 11.7 eV lamp available

### Keypad

3 fixed function keys and 3 menu keys

Status Display

2-line, 16-character dot-matrix, backlit, liquid crystal display for alphanumeric readouts and menu key display

### Meter Display

4-digit for real-time concentration readout with backlight

Datalogger Memory 16 kilobytes or 1000 entries

### Serial Output

RS – 232 for tabular and graphic printouts and connection to Windows<sup>®</sup> based PC

Audio Output 95 decibels @ 2048 Hz, on Alarm

Inlet Connection 1/8" compression fitting

Operating Temperature Range 0°C to 40°C (32°F to 105°F)

- Operating Humidity Range 0 to 100% relative humidity (non-condensing)
- Operating Concentration Range 0.5 PPM to 2000 PPM isobutylene equivalent

Response Time Less than 3 seconds, to 90%

Accuracy ± 10 % or ± 2 PPM, whichever is greater

Low Detection Limit 0.5 PPM isobutylene

Intrinsic Safety Class I, Division 1, Groups A, B, C, & D Zone 1 locations Eex ib m IIC T4, Demko No. 95D 119 472



PHOTOVAC, Inc. 176 Second Avenue I Waltham, MA 02451-1166 USA I Phone: 781-290-0777 Fax: 781-290-4884 PHOTOVAC Europa Bredabaan 885 I B-2170 Antwerp BELGIUM I Phone: +32-3-646-0456 Fax: +32-3-646-0095 visit us at www.Photovac.com

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### COMPOUNDS DETECTABLE WITH PHOTOVAC PIDs, FIDs AND PORTABLE GAS CHROMATOGRAPHS

	IONIZATION	AN.	ALYZ	ZER		IONIZATION	ANA	<b>ALYZ</b>	ÆR
<u>COMPOUND</u>	POTENTIAL(eV)	<u>GC</u>	<u>PID</u>	<u>FID</u>	COMPOUND	POTENTIAL(eV)	<u>GC</u>	<u>PID</u>	<u>FID</u>
Acetaldehyde	10.21	$\checkmark$	$\checkmark$	$\checkmark$	3-Bromopropene	9.70	$\checkmark$	$\checkmark$	$\checkmark$
Acetic Acid	10.37		$\checkmark$	$\checkmark$	2-Bromothiophene	8.63	$\checkmark$	$\checkmark$	$\checkmark$
Acetone	9.69	$\checkmark$	$\checkmark$	$\checkmark$	o-Bromotoluene	8.79	$\checkmark$	$\checkmark$	$\checkmark$
Acetonitrile	12.20	$\checkmark$		$\checkmark$	m-Bromotoluene	8.81	$\checkmark$	$\checkmark$	$\checkmark$
Acetylene*	11.41	$\checkmark$	$\checkmark$	$\checkmark$	p-Bromotoluene	8.67	$\checkmark$	$\checkmark$	$\checkmark$
Acetylene Dichloride	9.80	$\checkmark$		$\checkmark$	1,3-Butadiene	9.07	$\checkmark$	$\checkmark$	$\checkmark$
Acetylene Tetrabromide	п.р.		$\checkmark$	$\checkmark$	2,3-Butadione	9.23	$\checkmark$	$\checkmark$	$\checkmark$
Acrolein	10.10	$\checkmark$	$\checkmark$	Ń	n-Butanal	9.83	$\checkmark$	$\checkmark$	$\checkmark$
Acrylonitrile	10.91	$\checkmark$	$\checkmark$	Ń	2-Butanal	9.73	Ń	Ń	V
Allene	9.83	$\checkmark$	$\checkmark$	$\checkmark$	n-Butane	10.63	$\checkmark$	$\checkmark$	$\checkmark$
Allyl Alcohol	9.67	V	$\checkmark$	$\checkmark$	2-Butanone	9.53	V	$\checkmark$	$\checkmark$
Allyl Chloride	10.20	$\checkmark$	$\checkmark$	$\checkmark$	iso-Butanol	10.47	$\checkmark$	$\checkmark$	V
Aminoethanol	9.87	$\checkmark$	V	$\checkmark$	sec-Butanol	10.23	$\checkmark$	$\checkmark$	$\checkmark$
2-Aminopyridine	8.34		$\checkmark$	$\checkmark$	tert-Butanol	10.25	$\checkmark$	$\checkmark$	$\checkmark$
Ammonia	10.15	$\checkmark$	$\checkmark$		1-Butene	9.58	$\checkmark$	$\checkmark$	$\checkmark$
n-Amyl Acetate	n.p.	$\checkmark$	$\checkmark$	V	cis-2-Butene	9.13	$\checkmark$	V	$\checkmark$
sec-Amyl Acetate	n.p	$\checkmark$	$\checkmark$	Ń	trans-2-Butene	9.13	$\checkmark$	$\checkmark$	$\checkmark$
Aniline	7.70		$\checkmark$	V	n-Butyl Acetate	10.01	$\checkmark$	$\checkmark$	V
Arsine	9.89	$\checkmark$	$\checkmark$		sec-Butyl Acetate	9.91	$\checkmark$	Ą	$\checkmark$
Benzaldehyde	9.53	Ń	$\checkmark$	4	t-Butyl Acetate	9.90	$\checkmark$	$\checkmark$	V
Benzene	9.25	$\checkmark$	$\checkmark$	$\checkmark$	n-Butyl Alcohol	10.04	V	V	$\checkmark$
Benzenethiol	8.33	$\checkmark$	$\checkmark$	$\checkmark$	n-Butylamine	8.71		$\checkmark$	$\checkmark$
Benzyl Chloride	9.14	V	$\checkmark$	V	i-Butylamine	8.70		$\checkmark$	$\checkmark$
Bromobenzene	8.98	$\checkmark$	$\checkmark$	V	s-Butylamine	8.70		$\checkmark$	V
1-Bromobutane	10.13	V	Ń	$\checkmark$	t-Butylamine	8.64		$\checkmark$	$\checkmark$
2-Bromobutane	9.98	$\checkmark$	Ń	ν	n-Butylbenzene	8.69	$\checkmark$	$\checkmark$	V
1-Bromobutanone	9.54	$\checkmark$	V	V	i-Butylbenzene	8.68	$\checkmark$	$\checkmark$	V
1-Bromo-2-chloroethane	10.63	$\checkmark$	$\checkmark$	$\checkmark$	t-Butylbenzene	8.68	$\checkmark$	V	$\checkmark$
Bromochloromethane	10.77	$\checkmark$		V	Butyl Cellosolve®	8.68	V	V	V
Bromodichloromethane	10.59	$\checkmark$	V	V	i-Butyl Ethanoate	9.95	V	1	V
1-Bromo-3-chloropropane	<b>n</b> .p.	V	1	V	n-Butyl Mercaptan	9.15	V	1	√
Bromoethane	10.28	v	$\checkmark$	V	t-Butyi Mercaptan	9.03	V	V	V
Bromoethene	9.80	$\checkmark$	V	V	iso-Butyl Mercaptan	9.12	$\checkmark$	$\checkmark$	V
Bromoform	10.48	$\checkmark$	$\checkmark$	V	i-Butyl Methanoate	10.46	$\checkmark$	$\checkmark$	$\checkmark$
1-Bromo-3-hexanone	9.26	$\checkmark$	$\checkmark$	V	p-tert-Butyltoluene	8.35	$\checkmark$	$\checkmark$	V
Bromomethane (Methyl Brom	i 10.53	$\checkmark$	$\checkmark$	$\checkmark$	1-Butyne	10.18	V	V	$\checkmark$
Bromomethy) Ethyl Ether	10.08	$\checkmark$	$\checkmark$	$\checkmark$	2-Butyne	9.85	$\checkmark$	$\checkmark$	V
I-Bromo-2-methylpropane	10.09	Ń	$\checkmark$	V	n-Butyraldehyde	9.86	V	$\checkmark$	V
2-Bromo-2-methylpropane	9.89	$\checkmark$	1	V	Carbon Disulfide	10.13	$\checkmark$	V	
1-Bromopentane	10.10	$\checkmark$	$\checkmark$	$\checkmark$	Carbon Tetrachloride*	11.28	V	$\checkmark$	$\checkmark$
1-Bromopropane	10.18	$\checkmark$	V	$\checkmark$	Cellosolve Acetate	n.p.	$\checkmark$	$\checkmark$	$\checkmark$

		IONIZATION	AN.	ALY7	LER		IONIZATION	AN	ALYZ	ZER
	COMPOUND	POTENTIAL(eV)	GC	PID	<u>FID</u>	COMPOUND	POTENTIAL(eV)	<u>GC</u>	<u>P1D</u>	FID
-	2-Bromopropane	10.08	$\checkmark$	$\checkmark$	$\checkmark$	Chloroacetaldehyde	10.16	$\checkmark$	$\checkmark$	$\checkmark$
	1-Bromopropene	9.30	v	$\checkmark$	$\checkmark$	Chlorobenzene	9.07	$\checkmark$	$\checkmark$	$\checkmark$
	2-Bromopropene	10.06	$\checkmark$	$\checkmark$	V	Chlorobromomethane	10.77	$\checkmark$		$\checkmark$
	I-Chloro-2-bromoethane	10.63	$\checkmark$	$\checkmark$	Ń	1,3-Dibromobutane	n.p		$\checkmark$	$\checkmark$
	1-Chlorobutane	10.67	1	$\checkmark$	V	1,4-Dihromobutane	n.p	$\checkmark$	$\checkmark$	$\checkmark$
	2-Chlorobutane	10.65	$\checkmark$	V	$\checkmark$	Dibromochloromethane	10.59	$\checkmark$	$\checkmark$	$\checkmark$
	1-Chlorobutanone	9.54	$\checkmark$	$\checkmark$	$\checkmark$	Dibromochloropropane	n.p.	$\checkmark$	$\checkmark$	$\checkmark$
	L-Chloro-2.3-enoxynronane	10.60	$\checkmark$	V	$\checkmark$	1,1-Dibromoethane	10.19	$\checkmark$	$\checkmark$	$\checkmark$
	Chloroethane (Ethyl Chloride)	10.97	$\checkmark$		$\checkmark$	Dibromomethane	10.49	$\checkmark$	$\checkmark$	V
	Chloroethene (Vinyl Chloride)	10.00	$\checkmark$	$\checkmark$	V	1,2-Dibromopropane	10.26	$\checkmark$	$\checkmark$	$\checkmark$
	2-Chloroethoxyethene	10.61	$\checkmark$	$\checkmark$	$\checkmark$	2.2-Dibromopropane	n.p.	$\checkmark$	$\checkmark$	$\checkmark$
	1-Chloro-2-fluorobenzene	9.16	$\checkmark$	$\checkmark$	V	Dibutylamine	7.69		$\checkmark$	$\checkmark$
	1-Chloro-3-fluorohenzene	9.21	V	V	V	1.2-Dichlorobenzene	9.07	$\checkmark$	$\checkmark$	$\checkmark$
	cis-1-Chloro-2-fluoroethene	9.87	J	V	J	1.3-Dichlorobutane*	n.p.	$\checkmark$	$\checkmark$	$\checkmark$
	trans 1-Chloro-2-fluoroethene	9.87	√	√	√	1.4-Dichlorobutane*	n.p.	$\checkmark$	$\checkmark$	$\checkmark$
	Chloraform*	11.37	J	√	√	cis-1.4-Dichloro-2-butene	n.p.	$\checkmark$	$\checkmark$	$\checkmark$
	c Chlausiadabanzana	8 35	J	J	J	2 2-Dichlorobutane*	n.p.	V	V	Ń
	Chloromethylethyl Ether	10.08	√	, J	J	2.3-Dichlorobutane*	n.p.	1	V	$\checkmark$
	Chloromethylmethyl Ether	10.25		J	V	3.4-Dichlorobutane*	n.p.	$\checkmark$	$\checkmark$	$\checkmark$
	L-Chloro-2-methylnronane	10.66	./	V	, J	1.1-Dichloroethane*	11.06	$\checkmark$	$\checkmark$	$\checkmark$
	Chloroprene	8 83	√	√	√	1.2 Dichloroethane (Ethylene Dichloride)	11.04	V	$\checkmark$	$\checkmark$
$\bigcirc$		10.82		√	, √	cis-1 2-Dichloroethene	9.65	$\checkmark$	$\checkmark$	$\checkmark$
	2 Chloropropane*	10.32	J	, J	, J	trans-12-Dichloroethene	9.66	V	V	$\checkmark$
	2-Chloropropane	10.04	./	, ,	J	1 1-Dichloroethene	10.00	V	V	$\checkmark$
	5-Chloroptopene	10.04	1	<b>ب</b>	J	Dichloroethyl Ether	n.p.	V	V	$\checkmark$
	p-Chlorostyrene	8.68	, ,	, ,	J	Dichloromethane (Methylene Chloride)*	11.35	1	V	V
	2-Chlorothlophene	8.83	, ,	, ,	J	1.2-Dichloronronane*	10.87	V	V	V
	m Chlorotoluene	8.83	1	V	1	1.3-Dichloropropage*	10.85	V	V	V
	n-Chlorotoluona	8.70	1	J	J	1 1-Dichloropropanone	9.71	V	V	V
	o Craval	8 48		√	√	2 3-Dichloropropene	9.82	$\checkmark$	$\checkmark$	V
	m Cresol	8 48		√	, J	Dicyclonentadiene	7.74	V	V.	V
	n Cresol	8 48		√	√	Diethoxymethane	9.70	V	V	V
	Cumana (i Bronyl Banzana)	8.75	V	1	√	Dicthylamine	8.01		J	V
	Cumene (I-1 rupyr Benzene)	0.73	, ,	v v	1	Diethylaminoethanol	8.58		√	J
	Crotonatdenyde	9.75	J	1	1	Diethyl Ether	9.53	1	, √	J
	Cyanoetnene"	10.91	, J	J		Diethyl Ketone	9.37	1	√	√
	Cyanogen Bromster	10.39	J	, ,	N	Diothyl Sulfide	8.43	J	, J	√
	S-Cyanopropene	10.59	1	J	N N	1.2-Difluorohenzene	9.31	J	, √	√
	Cyclobutane	0.08	1	N.	J	1.4-Difluoroberzene	9.15	1	, ,	√
	Cyclohexane	10.00	N.	J	۰. ا	Difluorodibromomethane*	11.18	, J		J
-	Cyclonexanor	0.1.1	N N	1	J	Difluoromethylbenzene	9.45	√	V	, √
	Cyclohexanone	9.14	1	, J	ึ่ง	Dijodomethane	9 34	, ,	, √	, J
	Cyclonexene	7.00	1	1	1	Dijsobutul Katona	9.04	J	√	, √
	Cyclo-octaterraene	1.77	V J	¥ _]	ч .1	Disonacylamine	7 72	Y	1	J
	Cyclopentaulene	0.33	V	۷	Y	Disopropyramine	1.15		,	•

		IONIZATION	AN	ALY	ZER		IONIZATION	AN/	ALYZ	LER
	COMPOUND	POTENTIAL(eV)	<u>GC</u>	<u>PID</u>	<u>FID</u>	COMPOUND	POTENTIAL(eV)	<u>GC</u>	<u>PID</u>	<u>FID</u>
_	Cyclopentane	10.52	V	$\checkmark$	$\checkmark$	1,1-Dimethoxyethane	9.65	$\checkmark$	$\checkmark$	$\checkmark$
$\bigcirc$	Cyclopentanone	9.26	$\checkmark$	$\checkmark$	V	Dimethoxymethane	10.00	$\checkmark$	$\checkmark$	$\checkmark$
	Cyclopentene	9.01	$\checkmark$	$\checkmark$	$\checkmark$	Dimethylamine	8.24		$\checkmark$	Ń
	Cyclopropane	10.06	$\checkmark$	$\checkmark$	$\checkmark$	Dimethylaniline	7.13		$\checkmark$	$\checkmark$
	2-Decanone	9.40	$\checkmark$	$\checkmark$	$\checkmark$	2,3-Dimethylbutadiene	8.72	$\checkmark$	$\checkmark$	$\checkmark$
	Diacetone Alcohol	n.p		$\checkmark$	Ń	2,2-Dimethylbutane	10.06	$\checkmark$	$\checkmark$	$\checkmark$
	2,2-Dimethylbutan-3-one	9.18	$\checkmark$	V	V	mono-Fluorobenzene	9.20	$\checkmark$	$\checkmark$	$\checkmark$
	2,3-Dimethylbutane	10.02	$\checkmark$	$\checkmark$	V	mono-Fluoroethene	10.37	$\checkmark$	$\checkmark$	$\checkmark$
	2,3-Dimethyl-2-butene	8.30		$\checkmark$	$\checkmark$	mono-Fluoromethanal	11.40	$\checkmark$	$\checkmark$	$\checkmark$
	3,3-Dimethylbutanone	9.17	$\checkmark$	$\checkmark$	V	Fluorotribromomethane	10.67	$\checkmark$	$\checkmark$	$\checkmark$
	Dimethyl Disulfide	8.46		$\checkmark$		o-Fluorotoluene	8.92	V	$\checkmark$	$\checkmark$
	Dimethyl Ether	10.00	$\checkmark$	$\checkmark$		m-Fluorotoluene	8.92	$\checkmark$	$\checkmark$	$\checkmark$
	Dimethylformamide	9.45		$\checkmark$	$\checkmark$	p-Fluorotoluene	8.79	$\checkmark$	$\checkmark$	$\checkmark$
	3,5-Dimethyl-4-heptanone	9.04	Ń	$\checkmark$	$\checkmark$	Formaldeliyde	10.88	$\checkmark$		
	1,1-Dimethylhydrazine	8.88		$\checkmark$	$\checkmark$	Freon 11 (Fluorotrichloromethane)	11.77			$\checkmark$
	2,2-Dimethyl-3-pentanone	8.98	$\checkmark$	$\checkmark$	$\checkmark$	Freon 12 (Dichlorodifluoromethane)	12.91	$\checkmark$		$\checkmark$
	2,2-Dimethylpropane	10.35	$\checkmark$	$\checkmark$		Freon 13 (Chlorotrifluoromethane)	12.91	$\checkmark$		$\checkmark$
	Dimethyl Sulfide	8.69	$\checkmark$	$\checkmark$	$\checkmark$	Freon 13 B-1 (Bromotrifluoromethane)	12.08	$\checkmark$		$\checkmark$
	Di-n-propyl Disulfide	8.27	$\checkmark$	V	V	Freon 14 (Carbon Tetrafluoride)	16.25	$\checkmark$		$\checkmark$
	Di-n-propyl Ether	9.27	$\checkmark$	$\checkmark$	$\checkmark$	Freon 21 (Dichlorofluoromethane)	12.00	$\checkmark$		$\checkmark$
-	Di-i-propyl Ether	9.20	$\checkmark$	$\checkmark$	V	Freon 22 (Chlorodifluoromethane)	12.45	$\checkmark$		$\checkmark$
	Di-n-propylamine	7.84		$\checkmark$	V	Freon 113 (1,2-Dichlorotrifluoroethane)	11.78	$\checkmark$		$\checkmark$
	Di-n-propyl Sulfide	8.30	$\checkmark$	$\checkmark$	$\checkmark$	Furan	8.89	$\checkmark$	$\checkmark$	$\checkmark$
	1,4-Dioxane	9.41	$\checkmark$		V	Furfuryl Alcohol	n.p.	$\checkmark$	$\checkmark$	$\checkmark$
	Epichlorohydrin	10.60	$\checkmark$	V	$\checkmark$	Furfural	9.21	$\checkmark$	$\checkmark$	$\checkmark$
	Ethane*	11.65	$\checkmark$	$\checkmark$	$\checkmark$	n-Heptane	10.07	$\checkmark$	$\checkmark$	$\checkmark$
	Ethanol	10.62	$\checkmark$	$\checkmark$	$\checkmark$	2-Heptanone	9.33	$\checkmark$	$\checkmark$	$\checkmark$
	Ethanolamine	9.87		$\checkmark$	Ń	4-Heptanone	9.12	$\checkmark$	$\checkmark$	$\checkmark$
	Ethanethiol (Ethyl Mercaptan)	9.29	$\checkmark$	$\checkmark$	Ń	n-Hexane	10.18	$\checkmark$	$\checkmark$	$\checkmark$
	Ethene (Ethylene)	10.52	$\checkmark$	$\checkmark$	$\checkmark$	Hexanone	ո.թ.	$\checkmark$	$\checkmark$	$\checkmark$
	Ethyl Acetate	10.11	$\checkmark$	$\checkmark$	$\checkmark$	2-Hexanone	9.44	$\checkmark$	$\checkmark$	$\checkmark$
	Ethyl Acrylate	<b>n</b> .p.	$\checkmark$	$\checkmark$	1	1-Hexene	9.46	$\checkmark$	V	$\checkmark$
	Ethylamine	8.86		$\checkmark$	$\checkmark$	sec-Hexyl Acetate	n.p.		$\checkmark$	$\checkmark$
	Ethyl Amyl Ketone	9.10	$\checkmark$	$\checkmark$	V	Hydrazine	n.p.	$\checkmark$	$\checkmark$	$\checkmark$
	Ethylbenzene	8.76	$\checkmark$	$\checkmark$	$\checkmark$	Hydrogen Selenide	9.88	$\checkmark$	$\checkmark$	
	Ethyl Bromide	10.29	V	$\checkmark$	$\checkmark$	Hydrogen Sulfide	10.46	$\checkmark$	$\checkmark$	
	Ethyl Butyl Ketone	9.02	$\checkmark$	$\checkmark$	$\checkmark$	Hydrogen Telluride	9.14	$\checkmark$	$\checkmark$	
	Ethyl Chloride	11.01	$\checkmark$		$\checkmark$	Iodobenzene	8.73	$\checkmark$	$\checkmark$	$\checkmark$
	Ethyl Chloroacetate	10.20	$\checkmark$	$\checkmark$	$\checkmark$	I-lodobutane	9.21	$\checkmark$	$\checkmark$	$\checkmark$
	Ethyl Ethanoate	10.10	$\checkmark$	$\checkmark$	V	2-Iodobutane	9.09	$\checkmark$	$\checkmark$	$\checkmark$
	Ethyl Ether	9.41	$\checkmark$	$\checkmark$		Iodoethane (Ethyl Iodide)	9.33	$\checkmark$	$\checkmark$	$\checkmark$
	Ethyl Disulfide	8.27	$\checkmark$	$\checkmark$	$\checkmark$	lodomethane (Methyl lodide)	9.54	$\checkmark$	V	$\checkmark$
	Ethylene Chlorohydrin	10.90	v	$\checkmark$	$\checkmark$	1-lodo-2-methylpropane	9.18	$\checkmark$	$\checkmark$	$\checkmark$
	Ethylene Dibromide (EDB)	10.37	$\checkmark$	$\checkmark$	Ń	1-lodo-2-methylpropane	9.02	V	$\checkmark$	$\checkmark$

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sternyncycionexanor	2.00	۲	¥	v	η-εειπασισμισμής ισαιάς	10.30		۷	v
Methylcyclohexanone	9.05		$\checkmark$	$\checkmark$	n-Perfluoropropyl-iodomethane	9.96	$\checkmark$	$\checkmark$	$\checkmark$
4-Methylcyclohexene	8.91	$\checkmark$	$\checkmark$	$\checkmark$	n-Perfluoropropyl-methyl Ketone	10.58	$\checkmark$	$\checkmark$	Ń
Methylcyclopropane	9.52	$\checkmark$	$\checkmark$	$\checkmark$	Phenol	8.69		$\checkmark$	$\checkmark$
Methyl Dichloroacetate	10.44	$\sqrt{t}$	$\checkmark$	$\checkmark$	Phenyl Ether	8.09	1	$\checkmark$	$\checkmark$
Methyl Ethanoate	10.27	Ń	$\checkmark$	$\checkmark$	Phenyl Isocyanate	8.77	$\checkmark$	$\checkmark$	$\checkmark$
Methyl Ethyl Ketone (MEK)	9.53	$\checkmark$	$\checkmark$	$\checkmark$	Phosphine	9.96	$\checkmark$	$\checkmark$	
Methyl Ethyl Sulfide	8.55	$\checkmark$	$\checkmark$	$\checkmark$	Pinene	8.07	$\checkmark$	$\checkmark$	$\checkmark$
2-Methyl Furan	8.39	$\checkmark$	Ń	$\checkmark$	Propadiene	10.19	$\checkmark$	$\checkmark$	$\checkmark$
Methyl lodide	9.54	$\checkmark$	$\checkmark$	$\checkmark$	n-Propanal	9.95	$\checkmark$	$\checkmark$	$\checkmark$
Propane*	11.07	$\checkmark$	$\checkmark$	Ń	1,1,1-Trifluoro-2-iodoethane	10.10	$\checkmark$	$\checkmark$	$\checkmark$
1-Propanethiol	9.20	V	$\checkmark$	$\checkmark$	Trifluoroiodomethane	10.40	$\checkmark$	$\checkmark$	$\checkmark$
n-Propanol	10.51	$\checkmark$	$\checkmark$	$\checkmark$	Trifluoromethylbenzene	9.68	$\checkmark$	$\checkmark$	$\checkmark$
Propanone	9.69	$\checkmark$	$\checkmark$	$\checkmark$	Trifluoromethylcyclohexane	10.46	$\checkmark$	$\checkmark$	V
Propenc	9.73	$\checkmark$	$\checkmark$	$\checkmark$	1,1,1-Trifluoropropene	10.90	$\checkmark$	$\checkmark$	$\checkmark$
Prop-l-enc-2-ol	8.20	Ń	$\checkmark$	$\checkmark$	Trimethylamine	7.82		$\checkmark$	$\checkmark$
Prop-2-ene-1-ol	9.67	$\checkmark$	Ń	$\checkmark$	2,2,4-Trimethyl Pentane	9.86	$\checkmark$	$\checkmark$	$\checkmark$
Propionaldehyde	9.98	$\checkmark$	$\checkmark$	$\checkmark$	2,2,4-Trimethyl-3-pentanone	8.82	$\checkmark$	$\checkmark$	$\checkmark$
n-Propyl Acetate	10.04	$\checkmark$	$\checkmark$	1	n-Valeraldehyde	9.82	$\checkmark$	$\checkmark$	$\checkmark$
n-Propyl Alcohol	10.20	$\checkmark$	$\checkmark$	Ń	Vinyl Acetate	9.19	Ń	$\checkmark$	$\checkmark$
n-Propylamine	8.78		Ń	$\checkmark$	Vinyl Bromide	9.80	$\checkmark$	$\checkmark$	$\checkmark$
n-Propylbenzene	8.72	$\checkmark$	$\checkmark$	$\checkmark$	Vinyl Chloride (Chloroethene)	10.00	$\checkmark$	$\checkmark$	$\checkmark$
Propylene	9.73	$\checkmark$	$\checkmark$	$\checkmark$	4-Vinylcyclohexene	8.93	$\checkmark$	$\checkmark$	$\checkmark$
Propylene Dichloride	10.87	$\checkmark$	$\checkmark$	$\checkmark$	Vinyl Ethanoate	9.19	$\checkmark$	$\checkmark$	$\checkmark$
Propylene Imine	8.76		$\checkmark$	$\checkmark$	Vinyl Fluoride	10.37	$\checkmark$	$\checkmark$	$\checkmark$
Propylene Oxide	10.22	$\checkmark$	$\checkmark$	$\checkmark$	Vinylidene Chloride (1,1-DCE)	10.00	$\checkmark$	$\checkmark$	$\checkmark$
n-Propyl Ether	9.27	4	$\checkmark$	$\checkmark$	Vinyl Methyl Ether	8.93	$\checkmark$	$\checkmark$	Ń
n-Propyl Formate	10.54	$\checkmark$	$\checkmark$	$\checkmark$	o-Vinyl Toluene	8.20		$\checkmark$	$\checkmark$
Propyne	10.36	$\checkmark$	$\checkmark$	$\checkmark$	o-Xylene	8.56	$\checkmark$	$\checkmark$	$\checkmark$
Pyridine	9.32		$\checkmark$	$\checkmark$	m-Xylene	8.56	$\checkmark$	$\checkmark$	$\checkmark$
Styrene	8.47	$\checkmark$	$\checkmark$	$\checkmark$	p-Xylene	8.45	$\checkmark$	$\checkmark$	$\checkmark$
Tetrabromoethane	n.p.	$\checkmark$	$\checkmark$	$\checkmark$	2,4-Xylidine	7.65		$\checkmark$	$\checkmark$
Tetrachloroethylene (PCE)	9.32	$\checkmark$	$\checkmark$	$\checkmark$					
1,1,1,2-Tetrachloroethane	n.p.	V	$\checkmark$	$\checkmark$	*The sensitivity of the 2020, TIP, MicroTI	P and GCs to	o these	;	
1,1,2,2-Tetrachloroethane	11.10	1	$\checkmark$	$\checkmark$	compounds may be enhanced using an 11.7	′ eV lamp ins	tead		
Tetrafluoroethene	10.12	Ń	$\checkmark$	$\checkmark$	of the standard 10.6 eV lamp energy.				
Tetrahydrofuran	9.54	$\checkmark$	$\checkmark$	$\checkmark$					
1,1,1,2-Tetrachloropropane	a.p.	$\checkmark$	$\checkmark$	$\checkmark$	n.p not published				
1,2,2,3-Tetrachloropropane	n.p.	$\checkmark$	$\checkmark$	$\checkmark$					
Thioethanol	9.29	Ý	$\checkmark$	$\checkmark$	GC = Voyager, 10S+, 10S70, 10S50, 10S3	0, 10S10 and	d 10A 1	10	
Thiomethanol	9.44	$\checkmark$	V	V	PID = 2020, TIPI, ,TIPII, MicroTIP MP-10	0, HL-200,			
Thiophene	8.86	$\checkmark$		$\checkmark$	MP-1000, HL-2000 and IS-3000				

		IONIZATION	AN	ALY	ZER		IONIZATION	AN.	ALYZ	LER
	COMPOUND	POTENTIAL(eV)	<u>GC</u>	<u>PID</u>	<u>FID</u>	COMPOUND	POTENTIAL(eV)	<u>GC</u>	<u>PID</u>	<u>FID</u>
	Ethylene Oxide	10.56	$\checkmark$	Ń	$\checkmark$	1-Iodopentane	9.19	$\checkmark$	$\checkmark$	$\checkmark$
	Ethyl Formate	10.61	$\checkmark$	$\checkmark$	Ń	1-lodopropane	9.26	$\checkmark$	$\checkmark$	$\checkmark$
	Ethyl lodide	9.33	$\checkmark$	$\checkmark$	$\checkmark$	2-Iodopropane	9.17	$\checkmark$	v	V
	Ethyl Mercaptan	9.29	$\checkmark$	$\checkmark$	$\checkmark$	o-lodotoluene	8.62		$\checkmark$	$\checkmark$
	Ethyl Methanoate	10.61	$\checkmark$	$\checkmark$	Ń	m-lodotoluene	8.61		1	$\checkmark$
	Ethyl Isothiocyanate	9.14	V	$\checkmark$	$\checkmark$	p-lodotoluene	8.50		$\checkmark$	$\checkmark$
	Ethyl Methyl Sulfide	8.55	$\checkmark$	$\checkmark$	Ń	Isoamyl Acetate	9.90	$\checkmark$	$\checkmark$	$\checkmark$
	Ethyl Propanoate	10.00	Ń	$\checkmark$	$\checkmark$	Isoamyl Alcohol	10.16	$\checkmark$	$\checkmark$	$\checkmark$
	Ethyl Trichloroacctate	10.44	$\checkmark$		1	Isobutane	10.57	V	$\checkmark$	
	Isobutylamine	8.70		$\checkmark$	$\checkmark$	Methyl Isobutyl Ketone (MIBK)	9.30	V	$\checkmark$	$\checkmark$
	Isobutyl Acctate	9.97	$\checkmark$	$\checkmark$	$\checkmark$	Methyl Isobutyrate	9.98	$\checkmark$	1	$\checkmark$
	lsobutyl Alcohol	10.47	Ń	$\checkmark$	$\checkmark$	Methyl Isocyanate	10.67	$\checkmark$		$\checkmark$
	Isobutyl Formate	10.46	Ń	Ń	$\checkmark$	1-Methyl-4-isopropylbenzene	n.p.	$\checkmark$	$\checkmark$	$\checkmark$
	lsobutylene	9.43	Ń	$\checkmark$		Methyl Isopropyl Ketone	9.32	$\checkmark$	$\checkmark$	$\checkmark$
	Isobutyraldehyde	9.74	v	$\checkmark$	$\checkmark$	Methyl Mercaptan (Methanethiol)	9.44	$\checkmark$	$\checkmark$	$\checkmark$
	Isopentane	10.32	Ń	$\checkmark$	$\checkmark$	Methyl Methacrylate	9.74	$\checkmark$	$\checkmark$	V
	Isoprene	8.85	Ń	V	Ń	Methyl Methanoate	10.82	$\checkmark$		$\checkmark$
	Isopropyl Acetate	9.99	$\checkmark$	$\checkmark$	$\checkmark$	2-Methylpentane	10.12	$\checkmark$	$\checkmark$	$\checkmark$
	Isopropyl Alcohol	10.16	$\checkmark$	$\checkmark$	$\checkmark$	3-Methylpentane	10.08	V	$\checkmark$	$\checkmark$
	lsopropylamine	8.72		$\checkmark$	$\checkmark$	2-Methylpropane	10.56	$\checkmark$	$\checkmark$	$\checkmark$
	lsopropylbenzene	8.75	$\checkmark$	$\checkmark$	$\checkmark$	2-Methylpropanal	9.74	$\checkmark$	$\checkmark$	$\checkmark$
	lsopropyl Ether	9.20	$\checkmark$	$\checkmark$	$\checkmark$	2-Methyl-2-propanol	9.70	$\checkmark$	V	$\checkmark$
	Isovaleraldehyde	9.71	$\checkmark$	$\checkmark$	$\checkmark$	2-Methylpropene	9.23	$\checkmark$	$\checkmark$	$\checkmark$
	Ketene	9.61	v	$\checkmark$		Methyl n-propyl Ketone	9.39	$\checkmark$	V	1
	Mesitylene	8.40	$\checkmark$	$\checkmark$	$\checkmark$	Methyl Styrcne	8.35	$\checkmark$	$\checkmark$	V
	Mesityl Oxide	9.08	$\checkmark$	$\checkmark$	$\checkmark$	Monomethyl Hydrazine	8.00	V	V	V
	Methane	12.98	V		V	Naphthalene	8.10	V	V	$\checkmark$
	Methanol*	10.85	$\checkmark$		$\checkmark$	Nitric Oxide	9.25	$\checkmark$	V	
	Methyl Acetate	10.27	V	$\checkmark$	V	Nitrobenzene	9.92		1	√
	Methyl Acrylate	10.72	V		$\checkmark$	p-Nitrochlorobenzene	9.96	,	V	V.
	Methylamine	8.97		V	1	n-Nonane	10.21	V	V	V
	Methyl Bromide (Bromometha	10.53	V	V	V	5-Nonanone	9.10	V	V	¥,
	2-Methyl-1,3-butadiene	8.85	V	Ń	V	n-Octane	10.24	V	N	V
	2-Methylbutanal	9.71	v.	V	V	3-Octanone	9.19	V	V	V
	2-Methylbutane	10.31	V.	1	V	4-Octanone	9.10	V	V	v
	2-Methyl-1-butene	9.12	Ń	v,	N,	1-Octene	9.52	N	V	v
	3-Methyl-1-butene	9.51	√	v	V	n-Pentane	10.53	V	V	v
	3-Methyl-2-butene	8.67	Ń	v	V	cis-1,3-Pentadiene	8.59	V	N	Y ,
	Methyl tert-Butyl Ether	9.41	v	V,	V	trans-1,3-Pentadiene	8.56	N	N	v
	Methyl n-Butyl Ketone	9.34	V,	V,	N	n-Pentanal	9.82	N	N	N
Ì	Methyl Butyrate	10.07	V	V.	N	2,4-Pentanedione	8.87	N ./	N J	. I
	Methyl Cellosofve	ո.թ.	N	N,	¥ ,	2-Pentanone	9.39	N	X J	v J
	Methyl Cellosolve Acetate	n.p.	N	V	N.	3-Pentanone	9.32	۲ ./	N J	V ./
	Methyl Chloroacetate	10.35	$\checkmark$	V	V	1-Pentene	9,50	۷	V	٧

1-Thiopropanol	9.20	$\checkmark$	V	4
Toluene	8.82	N	Ń	$\checkmark$
o-Toluidine	7.44	Ý	$\checkmark$	$\checkmark$
Tribromoethene	9.27	$\checkmark$	$\checkmark$	$\checkmark$
1,1,1-Trichlorobutanone	9.54	$\checkmark$	$\checkmark$	Ń
1,1,1-Trichloroethane*	11.25	$\checkmark$	$\checkmark$	$\checkmark$
1,1,2-Trichloroethane*	11.00	$\checkmark$	٧	$\checkmark$
Trichloroethylene (TCE)	9.45	$\checkmark$	$\checkmark$	$\checkmark$
Trichloromethyl Ethyl Ether	10.08	$\checkmark$	$\checkmark$	$\checkmark$
1,1,2-Trichloropropane	n.p.	Ń	$\checkmark$	Ń
1,2,3-Trichloropropane	n.p.	Ń	$\checkmark$	$\checkmark$
Triethylamine	7.50		Ń	$\checkmark$
1,2,4-Trifluorobenzene	9.37	Ń	v	V
1,3,5-Trifluorobenzene	9.32	1	V	$\checkmark$
Trifluoroethene	10.14	$\checkmark$	$\checkmark$	1

Many compounds not appearing in this list, with an ionization potential of 12.0 eV or less, may also be detectable.

For further information, please contact the Technical Services/ Applications Department at Photovac.

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### <u>Appendix B</u>

Treatment System Operation and Maintenance Logs

### Sid Harvey Industries Valley Stream, New York Air Sparge System

### **Inspection and Maintenance Checklist**

	Equipment		Freq	uency					
	Maintenance/Inspection Activity	Every Visit	Monthly	Prequency   ly Quarterly   Annually     Image: Second state s					
	Inspect perimeter fence and padlock	X							
Building & Grounds:	Inspect building perimeter for damage, vandalism, etc.	X	_						
	Screen building perimeter for VOCs with PID	X							
	Inspect individual AS well piping for leaks	X							
AS Piping:	Record effluent flow rate	X							
	Inspect piping manifold for leaks	X							
	Record compressor temperature and air pressure	X							
	Inspect inlet filter	X							
	Blower fan, compressor fins, bearings, compressor rings, magnetic starter, andsafety valve				x				
S Compressor:	Inspect V-belt			X					
	Inspect unloader spring			X					
	Check Pressure Switch				X				
****	Insepect wrist pin bearing				X				
	Inspect electrical connections to control panel		X						
Jontrol Panel:	Inspect interlock connections to control panel		X						

NAC CONSULTAN 1. S. INC.

Soil Vapor Extraction System Valley Stream, New York Sid Harvey Industries

## **System Operation Log**

To: Dates From:

			_	_	 _		 	 _	 _	 _	1	
Onerator												
Flow Rate Reading	Flow Rate Reading (cfm)											
Temperature	Reading											
	SVE-6					_						
f water)	4 SVE-5											
inches of	-3 SVE-											
adings (i	-2 SVE											
ssure Re	E-1 SVE								 			
uum Pre	aust											orke.
Vaci	er Exh							 				Dom
	eBlow											
its s/no)	Blower Temperatur											
Check Alarm Ligh (is the alarm on? yes	Low Vacuum											u u
	KO Drum											KO Drun
Inspection Date and	Time											

O Drum	allons of Water Removed (approx)		
	Date/Time Emptied		

NUMBER NS.

### Sid Harvey Industries Valley Stream, New York Air Sparge System

### System Operation Log

Inspection Date: \_\_\_\_\_

Well Hourmeter	Pressure Measurement (psig)	Well Flow Measurement (cfm)
	Well Hourmeter	Well Hourmeter       Pressure Measurement (psig)

NAC CONSULTANTS, INC.

0

Sid Harvey Industries Valley Stream, New York Air Sparge System Defective Equipment & Repair Log

Dates From: To:

tallation Date					
Repairs &/or Replacement Part(s) In: Installed					
Cause					
Affected Area(s)					
Defective Part(s)					
Inspection Date					Remarks:

NAC CONSULTANTS, INC.

Sid Harvey Industries Valley Stream, New York Air Sparge System

# **Corrective Action Log**

Dates From:

T0:

	 	-	 	 	 	 1
Preventative Measures						
Corrective Actions						
Defective Equipment						
Problem						
Source						
Date Occurred						Remarks:

NAC CONSULTANT, NC.

Sid Harvey Industries Valley Stream, New York Air Sparge System

# **Replacement Part Log**

Dates From: To:

Installation Date				
Cost				
Manufacturer/Distributer				
Catalog Number				
Part Number				
Replacement Part(s)				
Inspection Date				

Remarks:

### <u>Appendix C</u>

Health and Safety Plan

### SID HARVEY INDUSTRIES, INC. VALLEY STREAM, NEW YORK

### REMEDIAL ACTION HEALTH AND SAFETY PLAN

**March 2007 REVISION** 

NAC CONSULTANTS, INC. 28 Henry Street Kings Park, New York 11754 tel 631-269-2680 fax 631-269-2685

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1.0 INTRODUCTION
2.0 RESPONSIBILITIES
3.0 SITE DESCRIPTION
4.0 PLANNED FIELD ACTIVITIES
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6.1 VOLATILE ORGANIC COMPOUND MONITORING
6.2 PARTICULATE MATTER (PM <sub>10</sub> ) MONITORING7
7.0 LEVELS OF PROTECTION
8.0 SITE CONTROL
9.0 EQUIPMENT DECONTAMINATION
10.0 SAFE WORK PRACTICES
11.0 EMERGENCY PLAN

### **ATTACHMENTS**

1.	Site	Visitors	Log
1.	0110	1010010	LUS

- 2. Tailgate Safety Meeting Form
- 3. Accident Reporting Form, OSHA 101
- 4. Utilities and Structures Checklist
- 5. Air Monitoring Log
## **1.0 INTRODUCTION**

NAC CONSULTANTS, INC. (NAC) will install and monitor a soil vapor extraction (SVE) / Air Sparge (AS) remediation system at Sid Harvey Industries, Valley Stream (site). This Health and Safety Plan (HASP) has been developed to address the potential physical and chemical hazards that NAC employees may face while performing the planned field activities. This HASP establishes procedures to minimize worker's exposures through personal protective equipment and safe work practices. This HASP has been developed to meet the requirements of the Occupational Safety and Health Administration (OSHA) regulation, Title 29, Code of Federal Regulations, Part 1910.120 (20 CAR 1910.120), "Hazardous Waste Operations and Emergency Response" (OSHA 1989). It is intended for the protection of NAC employees. Anyone else, such as subcontractors, client, and visitors may review NAC's HASP and follow its procedures if they so decide. Subcontractors and others working on the site must provide their own HASP to be followed by their personnel.

# 2.0 RESPONSIBILITIES

Michael Bluight has been designated as the Site Safety Officer (SSO) for NAC. He will be responsible for implementing the procedures and safe work practices established in this HASP. In the event that the SSO must leave the site while the work is in progress, an alternate SSO will be designated to ensure that the HASP will continue to be followed. The SSO will report all health and safety matters to the project manager, Nicholas A. Andrianas, P.E. who has responsibility for overseeing the planned activities. Christopher Creed, a NAC principal, will also be available on an as needed basis. Subcontractors and others that may be involved in the work must designate a SSO for their firm and the SSO shall enforce compliance with the subcontractors HASP.

## **3.0 SITE DESCRIPTION**

Sid Harvey Industries is located at 100 East Mineola Avenue, Valley Stream, New York. The property is zoned for industrial use and is privately owned.

The site is approximately 1 acre with approximately 33,000 square feet of manufacturing and office space. The properties around the site are in industrial, commercial, and residential use. The properties to northeast across East Mineola Avenue consist of an industrial facility and a bus garage. SHI is bordered on the east/southeast by the Long Island Railroad trestle, an industrial facility, truck service garage and waste container storage yard. A limousine company occupies the property south of SHI and residential properties are located west and north of the site. Other properties south of the site consist primarily of industrial and manufacturing establishments. The area was reportedly used historically by various petroleum product and coal supply companies.

The facility was constructed around the 1940s. Various building additions were constructed since the original operation began at the site. The approximate 1 acre property is entirely developed. The area around the buildings is paved for parking and material handling (loading and unloading).

# 4.0 PLANNED FIELD ACTIVITIES

The following is a brief description of the planned field activities by task:

Task 1.Routine maintenance, groundwater and air sampling to monitor and gauge the<br/>effectiveness of the system.

# **5.0 HAZARD EVALUATION**

The potential physical and chemical hazards associated with the planned field activities for this site are evaluated in this document.

The physical hazards associated with the planned field activities include the following: potential for being struck by flying and falling objects while working near the drill rig; being splashed with potentially contaminated liquids during well installation and well sampling, slips and falls due to wet or uneven surfaces, pressurized gasses / pipes, electrical shock, lock-out tag-out, noise, and stored energy.

The chemical hazards associated with this site are based on the soil and groundwater sampling results obtained from the site investigation. Volatile organic compounds (VOCs) were detected in the soil, soil gas, and groundwater during this study. Based on this information, the following exposure pathways have been identified in order to minimize potential worker's exposure:

- Inhalation of vapors and gasses.
- Direct skin contact with and absorption of vapors, liquids, soil, and sediments.
- Accidental ingestion of contaminants.
- Inhalation of particulate metals in soil.

## 6.0 COMMUNITY AIR MONITORING PLAN

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

Real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. VOC and particulate monitoring will be performed during well and SVE / AS system installation. VOC monitoring will be performed during non-instrusive field work, such as groundwater and air sampling.

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

## 6.1 Volatile Organic Compound Monitoring

VOCs will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) with a photoionization detector on a continuous basis during the work. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The photoionization detector shall be equipped with a 11.7 eV UV lamp to detect ionizing chlorinated compounds. The photoionization detector will be zero-calibrated and calibrated

against a standard calibration gas daily.

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

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

# 6.2 Particulate Matter (PM<sub>10</sub>) Monitoring

Particulates (PM<sub>10</sub>)will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) with a MIE PDR-1000 Aerosol Monitor, a MDA Scientific P-5 Digital Dust Indicator or similar monitor on a continuous basis during the work. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions.

If the downwind particulate level is 100 micrograms per cubic meter (mcg/m <sup>3</sup>) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust

suppression techniques provided that downwind  $PM_{10}$  particulate levels do not exceed 150 mcg/m<sup>3</sup> above the upwind level and provided that no visible dust is migrating from the work area.

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

# 7.0 LEVELS OF PROTECTION

Based upon the hazard evaluation results, Task 1 will be performed in Level D protection. In the event that the established action level is exceeded, the level of protection will be upgraded to Level C. The following is a description of the personal protective equipment required for each level:

Level D

- Hard hat (optional for all tasks except well drilling).
- Disposable coveralls (optional).
- Safety glasses, goggles, or face shield (optional for all tasks except welding, well drilling or work involving pressurized piping).
- Steel-toe and shank, chemical-resistant boots.
- Chemical-resistant gloves (optional except when handling soil, sediment or surface water).
- Hearing protection, NRR of 35 decibels if noise exceeds OSHA safe level of 85 decibels .

Level C

- Hard hat (optional for all tasks except well drilling).
- Disposable coveralls (optional).
- Safety glasses, goggles, or face shield (optional for all tasks except welding, well drilling or work involving pressurized piping).
- Steel-toe and shank, chemical-resistant boots.
- Chemical-resistant gloves (optional except when handling soil, sediment or ground water).
- Shoulder harness and lifeline (only required for confined space entry).
- Hearing protection, NRR of 35 decibels if noise exceeds OSHA safe level of 85 decibels.
- Full face air purifying respirator equipped with organic vapor cartridges.

To evaluate whether actual field conditions will require an upgrade in the level of protection, the following action level procedure base upon the existing data based has been established for all planned field activities. VOC monitoring will be conducted using an PID instrument during each task. A 1 part per million (ppm) reading for a sustained period of 5 minutes in the worker's breathing zone has been selected as an action level based on the presence of vinyl chloride. If this occurs, a second screening step using a Draeger tube specific for vinyl chloride will be done to confirm whether vinyl chloride concentrations exceed 1 ppm in the worker's breathing zone. If the action level is exceeded, work will be discontinued, the work area will be permitted to vent while the workers move to an area upwind. Work will not resume until the vinyl chloride concentrations fall below 1 ppm.

If after 30 minutes, the concentration of vinyl chloride does not fall below the action level, then the work will resume with the level of protection upgraded to Level C using either a half-face or full-face air purifying respirator equipped with an organic vapor cartridge. Once in Level C, vinyl chloride tubes will be drawn every 30 minutes to monitor its presence. When this monitoring indicates that the concentration is below the action level, then downgrading to Level D is possible. If the monitoring indicates that the vinyl chloride concentration exceeds 10 ppm, all work will be discontinued, and workers will move to an area upwind. Work will not be resumed until air monitoring results confirm that the levels are less than 10 ppm.

If excessive dust (> 150 mcg/m<sup>3</sup>) is detected in the work area, then the level of protection will be upgraded using either a half-face or full face air purifying respirator equipped with an appropriate dust/mist cartridge or combination dust/mist and organic vapor cartridge.

# **8.0 SITE CONTROL**

Prior to the start of the field activities, the SSO will be responsible for the designation of the work zone, support zone, and clean zone. The work zone will be an area surrounding the immediate work being performed, where the greatest potential hazards exist. Only the necessary workers required to perform the work will be permitted in this zone. A support zone will be established for the storage of equipment.

# 9.0 EQUIPMENT DECONTAMINATION

The well casings, samplers, tools, rig and any piece of equipment that comes in contact (directly or indirectly) with the formation, will be decontaminated on-site prior to drilling. Equipment will be cleaned at a specific decontamination area, between each borehole, and prior to leaving the site. All on-site cleaning activities will be monitored by the field hydrogeologist. In addition to the drilling and sampling equipment, the following equipment will be used during the drilling and sampling of boreholes.

- Alconox Laboratory Grade Detergent
- Brushes
- Plastic Buckets
- Distilled Water
- Potable Water
- Photo-ionization detector (PID)
- Health & Safety Equipment (As discussed in the Health & Safety Plan)
- Sample Containers

The split spoon sampler will be decontaminated prior to collecting each sample. Disposable gloves will be worn while equipment is cleaned to avoid contamination, and the gloves will be changed frequently. The procedure for cleaning sampling equipment is as follows:

- 1. A solution of Alconox and potable water will be prepared in a bucket
- 2. The split spoon sampler will be disassembled and all parts and the spatula will be immersed in the Alconox solution.
- 3. All equipment will be scrubbed with a brush to remove any adhering particles.

- 4. All equipment will be rinsed with potable water.
- 5. The clean split spoon sampler will be reassembled and placed on clean plastic sheeting until it is needed. The split spoon sampler will be handled by the field hydrogeologist or the drilling crew only when clean gloves are being worn.

The decontamination procedures for the submersible pump are as follows:

- Personnel will wear disposable gloves at all times during the decontamination procedure and will change gloves as necessary.
- 2. The pump will be removed from the well and placed, with the electrical cord, into a clean bucket. The equipment will be rinsed with clean potable water.
- 3. The interior and exterior of the pump will be rinsed with an Alconox solution. A brush will be used to scrub the pump and cord clean using the Alconox solution.
- 4. The pump and cord will be placed in a clean bucket. The interior and exterior of the pump and the exterior of the cord will be triple rinsed with distilled water.
- 5. The clean pump and cord will be placed in a clean plastic bag.

Cuttings generated during drilling that are contaminated and cannot be left in place and will be placed in drums or stockpiled under plastic sheeting until they can be removed from the drilling area for disposal. The method of disposal will be determined after the nature of contamination in the cuttings has been determined. Purged groundwater generated during groundwater sampling, aquifer profile sampling and/or monitoring well installation will be containerized in 55-gallon drums. The collected waters will be treated on-site by pumping the drum contents through a Carbtrol L-1 Liquid-Phase Granular Activated Carbon (GAC) drum and discharging the treated water directly to the sewer.

Prior to and between each water treatment, tap water will be pumped into the drum and a sample will be collected from the drum discharge. The sample will be analyzed for VOC content (USEPA method 8260) to determine if VOC breakthrough exists for this drum. If breakthrough conditions exist above NYSDEC groundwater standards, the drum will be properly shipped off-site to a official receiving facility and replacement drum will be ordered.

# **10.0 SAFE WORK PRACTICES**

A pre-entry, tailgate safety meeting will be conducted prior to the start of each task to discuss the associated hazards. Attendees will be recorded on the Tailgate Safety Meeting Form (Attachment 2).

- All utilities and structures will be cleared and marked out prior to the start of any ground intrusive work. Attachment 4 will be used to record this information.
- The SSO will inform all subcontractors of the potential hazards associated with the site and the planned field activities. A copy of the HASP will be made available for their review.
- No eating, drinking, or smoking will be permitted in the work and support zones.
- No sources of ignition, such as matches or lighters will be permitted in the work and support zones.
- Calls for help will be made via the cellular phone.
- During hazardous weather conditions, such as lightning and thunder storms, work will cease immediately.

## **11.0 EMERGENCY PLAN**

On-site verbal communications should not be a problem since all tasks will be performed in Level D protection. In the event that the action level is exceeded and personnel are upgraded to Level C protection, verbal communications may become difficult. A universal set of hand signals will then be used. They are as follows:

Hand gripping throat:	Can't breathe.
Grip partner's wrist or place hands around waist	Leave work area immediately.
Hand on top of head:	Need assistance.
Thumbs up:	OK, I'm all right.
Thumbs down:	No, negative.

Communications from the site will be though a cellular telephone which will be brought to the site.

All job-related injuries and illnesses will be reported to the SSO. If medical attention is needed, the injured worker will be decontaminated, if possible, prior to leaving the site. The SSO will investigate the cause of the accident and corrective measures will be taken before the work can resume. It will be the responsibility of the SSO to complete the accident reporting form, OSHA 101, included in this report for all injuries. The completed OSHA 101 (Attachment 3) should be forwarded to the office health and safety manager within six days for recording into the OSHA 200 log. If there is a fatality, or if 5 or more workers are hospitalized as a result of a single incident, the SSO will contact the office health and safety manager immediately for OSHA reporting purposes.

# **EMERGENCY TELEPHONE NUMBERS**

Police	911
Fire	911
Franklin General Hospital	(516) 256-6000
Chemtrec	(800) 424-9300
NYSDEC Spills	(800) 457-7362

# **HOSPITAL**

The closest hospital to the site is Franklin General Hospital, Valley Stream, New York. To get to the hospital, go west to Rockaway Avenue, north on Rockaway Avenue to the Southern State Parkway, east on Southern State Parkway to Franklin Avenue and exit south to the hospital.



ATTACHMENT 1

SITE VISITORS LOG

# SITE VISITORS LOG

THE UNDERSIGNED VISITORS REQUIRE ENTRANCE TO THE EXCLUSION ZONE AND HAVE THOROUGHLY READ THE HEALTH AND SAFETY PLANS. I UNDERSTAND THE POTENTIAL HAZARDS AT THE SITE AND THE PROCEDURES TO MINIMIZE EXPOSURE TO THE HAZARDS, WILL FOLLOW THE DIRECTION OF THE SITE HEALTH AND SAFETY MANAGER, AND WILL ABIDE BY THE HEALTH AND SAFETY PLAN.

NAME	COMPANY	DATE	SIGNATURE

ATTACHMENT 2

TAILGATE SAFETY MEETING FORM

# TAILGATE SAFETY MEETING

	Prepared by	/	
Client	Project		
Date	Project Number		
Work Location Type of Work to be Done			
SAFETY	TOPICS PRESE	NTED	
Chemical Hazards			
Physical Hazards/Underground Utiliti	es		
Protective Clothing/Equipment			
Special Equipment Emergency Procedures			
Hospital/Clinic		Phone ( )	
Paramedic Phone ( ) Hospital Address			Other
			_
NAME PRINTED	<u>ATTENDEES</u>	<u>SIGNATURE</u>	

# ATTACHMENT 3

# **ACCIDENT REPORTING FORM, OSHA 101**

# OSHA FORM 101

# SUPPLEMENTARY RECORD OF OCCUPATIONAL INJURIES AND ILLNESSES

1 N.a	ER				
1. 194	ame				
2. Ma	ail Address			···	
		(No. and street)	(City or lown	1)	(State)
3. Lo	ocation, if different	from mail address			
1JURED	OR ILL EMPLO	YEE			
4. Na	ame	(h.(; d.d)	Social	Security No	
្រ ប្រ		(Middle name) (Lasi	name)		
э. по	(No. a	and street)	(City or town)		(State)
6. Ag	že Š	7. Sex: Male	Female	(Check one)	<b>y</b> - • <b>y</b>
8. Oc	cupation				
	(Enter regu	ilar job title, not the specific ac	ivity he was performing at t	time of injury.)	
9. De	epartment				
	(Enter nad	ne of department or division in	which the injured person is re	gularty employed, even the	ugh he may have been temporarily
	working in	another department at the tim	e of injury.)		
HE ACC	IDENT OR EXPC	SURE TO OCCUPATI	ONAL ILLNESS		
IO. Pla	ace of accident or e	exposure			
15.	accident of expositi	(No. and street)	) · (C s premises aive addres	hty or lown)	(State) hment in which it occurred
Do	o not indicate dena	artment or division withi	n the plant or establis	hment. If accident of	ccurred outside employer's
pre	emises at an identif	fiable address, give that a	ddress. If it occurred	on a public highway	or at any other place which
car	nnot be identified	by number and street, pl	ease provide place refe	erences locating the p	lace of injury as accurately
as	possible.		-		
11. Wa	as place of acciden	t or exposure on employ	er's premises?	(Yes or No)	
12. WI	hat was the employ	yee doing when injured?			
			(Be specific. If he was usin	g tools or equipment or ha	indling material.
пал	me them and tell what h	re was doing with them.)			
13. HO	ow did the accident	(Describe (ully the events)	which resulted in the injury or	occupational illness. Tell w	hat happened and how it happened
		(During the create	and reserves in the injury of	occupational minute. Ten -	
Na	me any objects or subst	tances involved and tell how the	ey were involved. Give full o	details on all factors which	ied or contributed to the accident
	e separate sneet for add	OR OCCUPATIONAL	IL I NECC		
ICCUPA	HONAL INJURT	UR OCCUPATIONAL	ILLNESS	<i>1</i>	
	escribe the injury of	or illness in detail and in	dicate the part of body	y affected	
14. De					
14. De				(e.g: amputatio	n of right index linger at second joir
14. De trac	icture of ribs; lead poise	oning; dermaintis of left hand, e	:tc.)	(e.g: amputatio	n of right index linger at second joir
14. De trac	icture of ribs; lead poinc ame the object or	oning; dermaintis of left hand, or substance which directly	nc.) injured the employee	(e.g: amputatio	n of right index linger at second join machine or thing he struc
14. De trac 15. Na ag	cture of nost lead pour ame the object or ainst or which stru	oning; dermatitis of left hand, e substance which directly ick him; the vapor or po	inc.) injured the employee ison he inhaled or swa	(e.g: amputatio . (For example, the illowed; the chemical	mot right index linger at second join machine or thing he struc or radiation which irritate
14. De trai 15. Na ag his	cture of nos; lead pouse ame the object or gainst or which stru s skin; or in cases of	oning; dermainis of left hand, of substance which directly sick him; the vapor or po of strains, hernias, etc., t	injured the employee ison he inhaled or swa he thing he was lifting	(e.g: amputation (For example, the illowed; the chemical ;, pulling, etc.)	mot right index linger at second joir machine or thing he struc or radiation which irritate
14. De trac 15. Na ag his	cture of nos; lead pouse ame the object or gainst or which stru s skin; or in cases of	oning; dermaints of left hand, of substance which directly ack him; the vapor or po of strains, hernias, etc., t	injured the employee ison he inhaled or swa he thing he was lifting	(e.g: amputation (For example, the illowed; the chemical g, pulling, etc.)	mot right index linger at second join machine or thing he struc or radiation which irritate
14. De trac 15. Na ag his	cture of nbs; lead pouse ame the object or gainst or which stru s skin; or in cases of	oning; dermatitis of left hand, of substance which directly lock him; the vapor or po of strains, hernias, etc., t	inc.) injured the employee ison he inhaled or swa he thing he was lifting	(e.g: amputation (For example, the illowed; the chemical g, pulling, etc.)	mot right index linger at second join machine or thing he struc or radiation which irritate
14. De trac 15. Na ag his 	eture of nos; lead poise ame the object or gainst or which stru s skin; or in cases of ate of injury or ini	oning; dermatitis of left hand, or substance which directly ick him; the vapor or po of strains, hernias, etc., t tial diagnosis of occupat	inc.) injured the employee ison he inhaled or swa he thing he was lifting ional illness	(e.g: amputation . (For example, the illowed; the chemical g, pulling, etc.)	mot right index linger at second join machine or thing he struc or radiation which irritate
14. De trav 15. Na 15. Na 16. Da	cture of nbs; lead poinc ame the object or gainst or which stru s skin; or in cases of ate of injury or ini	substance which directly substance which directly suck him; the vapor or po of strains, hernias, etc., t tial diagnosis of occupat	inc.) injured the employee ison he inhaled or swa he thing he was lifting ional illness	(e.g: amputation . (For example, the illowed; the chemical g, pulling, etc.) (Date: (Date: 10.100)	n of right index linger at second join machine or thing he struc or radiation which irritate
14. De trav 15. Na ag his 	ciure of nos; lead pouc ame the object or gainst or which stru s skin; or in cases of ate of injury or ini id employee die?	being; dermainis of left hand, of substance which directly sick him; the vapor or po of strains, hernias, etc., t tial diagnosis of occupat	injured the employee ison he inhaled or swa he thing he was lifting ional illness	(e.g: amputation (For example, the illowed; the chemical g, pulling, etc.) (Date	mot right index linger at second joir machine or thing he struct or radiation which irritate
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14. De trai	ame the object or gainst or which stru s skin; or in cases of ate of injury or ini id employee die? _ ame and address o	bunng; dermatitis of left hand, of substance which directly ick him; the vapor or po of strains, hernias, etc., t tial diagnosis of occupat (Yes or No	injured the employee ison he inhaled or swa he thing he was lifting ional illness	(e.g: amputation (For example, the allowed; the chemical ;, pulling, etc.) (Dat	mot right index linger at second join machine or thing he struc or radiation which irritate
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14. De trai 15. Na ag his 	ame the object or sainst or which stru s skin; or in cases ate of injury or ini id employee die? _ ame and address o hospitalized, name	bning; dermainis of left hand, of substance which directly lock him; the vapor or po of strains, hernias, etc., t tial diagnosis of occupat (Yes or No of physician e and address of hospital	injured the employee ison he inhaled or swa he thing he was lifting ional illness	(e.g: amputation (For example, the illowed; the chemical g, pulling, etc.) (Dat	mot right index linger at second join machine or thing he strue or radiation which irritate
14. De trai 15. Na ag his 	ame the object or gainst or which stru s skin; or in cases of ate of injury or ini id employee die? _ ame and address of hospitalized, name	oning; dermatitis of left hand, of substance which directly lock him; the vapor or po of strains, hernias, etc., t tial diagnosis of occupat (Yes or No of physician e and address of hospital	bin injured the employee ison he inhaled or swa he thing he was lifting ional illness	(e.g: amputation (For example, the illowed; the chemical g, pulling, etc.) (Date	machine or thing he struc or radiation which irritate
14. De 14. De 15. Na ag his 	ame the object or gainst or which stru s skin; or in cases of ate of injury or ini id employee die? ame and address of hospitalized, name	oning; dermatitis of left hand, of substance which directly lock him; the vapor or po of strains, hernias, etc., t tial diagnosis of occupat (Yes or No of physician e and address of hospital	Prepared by	(e.g: amputation (For example, the illowed; the chemical g, pulling, etc.) (Date (Date	mot right index linger at second join machine or thing he struc or radiation which irritate

ATTACHMENT 4

.

UTILITIES AND STRUCTURES CHECKLIST

# UTILITIES AND STRUCTURES CHECKLIST

Project:	Prepared by:
Location:	Date:

Instructions. This checklist has to be completed by a staff member as a safety measure to insure that all underground utility lines, other underground structures as well as above-ground power lines are clearly marked out in the area selected for boring or excavation. DRILLING OR EXCAVATION WORK MAY NOT PROCEED UNTIL LINES ARE MARKED AND THIS CHECKLIST HAS BEEN COMPLETED. Arrangements for underground utility markouts are best made at the time o the preliminary site visit to allow client and/or utility company sufficient time. Keep completed checklist and maps onsite send copy to Project Manager.

Assignment of Responsibility. Client is responsible for having underground utilities and structures located and marked Preferably, the utilities themselves should mark out the lines.

Drilling or Excavation Sites. Attach a map of the property showing the proposed drilling or excavation site (or if sites are widely separated, several maps) clearly indicating the area(s) checked for underground utilities or underground structures and the location of above-ground power lines.

Utilities and Structures	Net		
Туре	Present	Present	How Marked?"
Petroleum products line			
Natural gas line			
Steam line			
Water line			
Sewer line			
Storm drain			
Telephone cable			
Electric power line			
Product tank			
Septic tank/drain field			
Overhead power line			

1) Flags, paint on pavement, wooden stakes, etc.

Name and affiliation of person who marked out underground lines or structures.

NAME	AGANIZATION	PHONE ,
Emergency Procedures Persons at site or facility to contact in case of emergence	су	
1	Phone	
2	Phone	
Fire Dept.: Phone	Ambulance: Phone	
Utility: Phone	Utility: Phone	
Utility: Phone	Utility: Phone	
Directions to nearest hospital (describe or attach map).		

**ATTACHMENT 5** 

HASP/CAMP AIR MONITORING LOG

# Sid Harvey Industries Valley Stream, New York Air Sparge System

# HASP/CAMP Air Monitoring Log

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\_\_\_\_

Date:

Page

		Upwind	Background Rea	adings										
Date	Time	Wind Direction	Wind Speed	VOCs (from PID)	Particulate Concentration (from MIE meter)									
			Second Second Second											
Daily Monitoring Log														
Date	Date     Time     Wind Direction     Wind Speed     VOCs (from PID)													
H														

Comments:

# <u>Appendix B</u>

Electronic Document Copies

#### Table 1 Soil Analytical Results (ug/kg): Volatile Organic Compounds USEPA Method 8260

Sample ID	VS-4	VS-4	VS-4	VS-4 DUP	VS-6	VS-6 DL	VS-6	VS-6	VS-5	VS-5 DL	VS-5 DL2	SL-1	SL-1 DL	SL-1 DL2	USB-1	USB-1 DL	SW-1	SW-2	SW-3	SW-3 DL	NYSDEC
Sample Depth	0' - 4'	4' - 8'	8' - 12'	8' - 12'	0' - 4'	0' - 4'	4' - 8'	8' - 12'	19' - 20'	19' - 20'	19' - 20'	4' - 12'	4' - 12'	4' - 12'	9'	9'	4' - 9'	4' - 9'	4' - 9'	4' - 9'	Soil Cleanup
Dilution Factor	1:1	1:1	1:1	1:1	1:1	10:1 D	1:1	1:1	1:1	100:1 D	500:1 D	1:1	100:1 D	500:1 D	5:1	50:1 D	1:1	1:1	1:1	50:1 D	Guidelines
Sample Date	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	5/7/2003	5/7/2003	5/7/2003	5/7/2003	5/7/2003	5/7/2003	(ppb) <sup>1</sup>
Dichlorodifluoromethane	$ND^2$	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*3								
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2									
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19									
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
1,1,2-Trichlorotrifluoroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Tert butyl alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
1,1-Dichloroethene	ND	1,000	13,000 J	ND	29,000	ND	ND	ND	ND	ND	ND	ND	ND	4							
Acrolein	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Acetone	ND	ND	8,800	ND	ND	ND	ND	ND	ND	ND	ND	1.1									
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	27									
Methyl tert-butyl Ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	120									
Methylene Chloride	ND	830	ND	ND	17,000	ND	ND	ND	ND	7.0 B	ND	ND	ND	1							
trans-1,2-Dichloroethene	ND	ND	360 J	ND	ND	ND	ND	ND	ND	ND	ND	3									
Vinyl Acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
1,1-Dichloroethane	ND	ND	ND	ND	2.0 J	ND	ND	ND	450 J	ND	ND	110,000 E	170,000	220,000 J	2,100 J	ND	3.8 J	130 J	5,900 J	ND	2
2-Butanone	ND	ND	1,000 J	ND	ND	ND	ND	ND	ND	ND	ND	3									
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190,000	6									
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
cis-1,2-Dichloroethene	ND	ND	650 J	ND	ND	ND	ND	ND	ND	ND	ND	*									
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3									
1,1,1-Trichloroethane	120	150	30 J	ND	300 E	730	12	77	630,000	8,700,000 E	8,200,000	2,200,000 E	12,000,000 E	18,000,000	240,000 E	240,000	78	13,000	1,100,000 E	930,000	7.6
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Benzene	ND	540 J	ND	ND	270 J	ND	ND	ND	ND	ND	ND	ND	ND	0.6							
1,2-Dichloroethane	ND	ND	3,500	ND	ND	ND	ND	ND	ND	ND	ND	1									
Trichloroethene	5.5	ND	ND	ND	2.9 J	ND	ND	ND	8,100	45,000 J	ND	22,000	17,000	ND	1,600 J	7,300 J	1.2 J	280 J	4,900 J	7,500 J	7
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
4-Methyl-2-Pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10									
Toluene	3.7 J	14 J	ND	ND	8.8	18 J	ND	ND	130,000	870,000	800,000	330,000 E	360,000	590,000 J	30,000	28,000 J	1.7 J	3,600	98,000	89,000	15
t-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
1,1,2-Trichloroethane	ND	ND	ND	ND	3.5 J	ND	ND	ND	2,700	14,000 J	ND	29,000	19,000 J	ND	2,900 J	ND	ND	360 J	5,800 J	ND	*
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3									
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Dibromochloromethane	ND	ND	ND	250,000	ND	ND	ND	ND	ND	ND	ND	*									
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Tetrachloroethene	58	29	3.6	9.7	150	240	2.2 J	470	150,000 E	820,000	760,000	450,000 E	340,000	520,000 J	62,000	72,000	51	4,700	130,000	130,000	14
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17									

#### Table 1 (cont'd) Soil Analytical Results (ug/kg): Volatile Organic Compounds USEPA Method 8260

Sample ID	VS-4	VS-4	VS-4	VS-4 DUP	VS-6	VS-6 DL	VS-6	VS-6	VS-5	VS-5 DL	VS-5 DL2	SL-1	SL-1 DL	SL-1 DL2	USB-1	USB-1 DL	SW-1	SW-2	SW-3	SW-3 DL	NYSDEC
Sample Depth	0' - 4'	4' - 8'	8' - 12'	8' - 12'	0' - 4'	0' - 4'	4' - 8'	8' - 12'	19' - 20'	19' - 20'	19' - 20'	4' - 12'	4' - 12'	4' - 12'	9'	9'	4' - 9'	4' - 9'	4' - 9'	4' - 9'	Soil Cleanup
Dilution Factor	1:1	1:1	1:1	1:1	1:1	10:1 D	1:1	1:1	1:1	100:1 D	500:1 D	1:1	100:1 D	500:1 D	5:1	50:1 D	1:1	1:1	1:1	50:1 D	Guidelines
Sample Date	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	5/7/2003	5/7/2003	5/7/2003	5/7/2003	5/7/2003	5/7/2003	(ppb)
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Ethyl Benzene	ND	17,000	94,000	85,000 J	41,000	36,000 J	ND	5,400	ND	ND	450 J	12,000	12,000 J	55							
m/p-Xylenes	ND	70,000 E	440,000	380,000 J	180,000 E	160,000 J	260,000 J	25,000	27,000 J	ND	2,000	55,000	58,000 J	12							
o-Xylene	ND	21 J	22,000	120,000	110,000 J	53,000 E	45,000 J	ND	11,000	11,000 J	5.3 J	990	19,000	19,000 J	12						
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Isopropylbenzene	ND	1,400	ND	ND	1,600	ND	ND	ND	ND	ND	ND	1,400 J	ND	23							
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6									
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	44	ND	ND	ND	3.4									
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
N-propylbenzene	ND	3,900	19,000 J	ND	3,900	ND	ND	1,600 J	ND	ND	220 J	3,600 J	ND	37							
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,600 J	ND	*									
1,3,5-Trimethylbenzene	ND	62	15,000	70,000 J	ND	13,000	ND	ND	8,200	12,000 J	14	1,300	17,000	24,000 J	33						
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	110									
1,2,4-Trimethylbenzene	ND	18 J	41,000 E	190,000	180,000 J	34,000	31,000 J	ND	21,000	27,000 J	6.9	3,200	48,000	60,000	130						
Sec-butylbenzene	ND	2,500	ND	ND	2,900	ND	ND	6,700	9,600 J	ND	ND	17,000	ND	110							
p-Isopropyltoluene	ND	60	4,900	18,000 J	ND	5,100	ND	ND	2,200 J	ND	8.3	330 J	4,800 J	ND	110						
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	1,500 J	ND	ND	190 J	1,600 J	ND	15.5									
1,4-Dichlorobenzene	ND	ND	ND	3.5 J	ND	ND	ND	ND	820	ND	ND	3,200	ND	ND	10,000	ND	1.2 J	1,300	1,600 J	ND	85
n-Butylbenzene	ND	28 J	5,800	32,000 J	ND	ND	ND	ND	3,400 J	ND	3.0 J	580 J	8,300	10,000 J	120						
1,2-Dichlorobenzene	ND	28 J	6,000	27,000 J	ND	26,000	ND	ND	14,000	8,400 J	8.3	1,800	14,000	12,000 J	79						
1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	34									
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Naphthalene	ND	2,000	ND	ND	3,500	ND	ND	8,300	ND	3.8 J	1,400	15,000	ND	130							
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*									
Total VOCs	183.5	193.0	33.6	13.2	467.2	988.0	14.2	764	1,115,940	11,472,000	10,515,000	3,568,780	13,428,000	19,590,000	456,900	442,300	237.5	35,830	1,564,500	1,541,500	
Total TICs	0.0	0.0	0.0	684.0	17.0	0.0	0.0	7,640	0	0	0	0	0	0	217,400	72,000	177.2	27,910	29,700	347,000	
Total VOCs and TICs	183.5	193.0	33.6	697.2	484.2	988.0	14.2	8,404	1,115,940	11,472,000	10,515,000	3,568,780	13,428,000	19,590,000	674,300	514,300	414.7	63,740	1,594,200	1,888,500	

Notes: 1. TAGM 4046 Guidance values (allowable soil concentration) are listed where applicable. 2. ND - Not Detected. CHEMTECH uses the qualifier "U" for analyzed non-detect compounds in its laboratory analyses. 3. No TAGM Soil Guidance value for this compound.

Data Reporting Qualifiers: J: Indicates an estimated value. This flag is used when the mass spectral data indicated the identification, however the result was less than the specified detection limit was greater than zero. E: Indicates the analyte's concentration exceeds the calibrated range of the instrument for that specific analysis. D: This flag identifies all compounds identified in an analysis at a secondary dilution factor.

### Table 2 Soil Analytical Results (ug/kg): Semi-Volatile Organic Compounds USEPA Method 8270

Sample ID	VS-4	VS-4	VS-4	VS-4 DUP	VS-6	VS-6 RE	VS-6	VS-6	VS-6 RE	VS-5	VS-5 DL	SL-1	SL-1 DL	USB-1	USB-1 DL	SW-1	SW-2	SW-2 RE	SW-3	SW-3 DL	NVSDEC
Sample Depth	0' - 4'	4' - 8'	8' - 12'	8' - 12'	0' - 4'	0' - 4'	4' - 8'	8' - 12'	8' - 12'	19' - 20'	19' - 20'	4' - 12'	4' - 12'	9'	9'	4' - 9'	4' - 9'	4' - 9'	4' - 9'	4' - 9'	Soil Cleanup
Dilution Factor	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	5:1	1:1	10:1 D	1:1	10:1 D	1:1	4:1 D	1:1	1:1	1:1	1:1	4:1 D	Guidelines (nph) <sup>1</sup>
Sample Date	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	5/7/2003	5/7/2003	5/7/2003	5/7/2003	5/7/2003	5/7/2003	5/7/2003	Ourdennies (ppb)
Phenol	$ND^2$	ND	720 J	41,000 E	20,000	2,300	2,500	ND	ND	ND	ND	ND	0.3								
bis(2-Chloroethyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	*3												
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	8												
1,2-Dichlorobenzene	ND	380	ND	3,400 E	3,400 J	27,000 E	12,000	ND	79												
1,3-Dichlorobenzene	ND	81 J	ND	ND	1,400 J	ND	15.5														
1,4-Dichlorobenzene	ND	55 J	ND	430	400 J	1,200	ND	ND	ND	ND	ND	ND	ND	ND	85						
2-Methylphenol	ND	730	750 J	ND	ND	ND	ND	ND	180 J	ND	1										
2,2-oxybis(1-Chloropropane)	ND	ND	ND	ND	ND	ND	ND	ND	*												
3+4-Methylphenols	ND	ND	ND	ND	ND	ND	ND	ND	*												
N-Nitroso-di-n-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	*												
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	*												
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	2												
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND	44												
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	3.3												
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	*												
bis(2-Chloroethoxy)methane	ND	ND	ND	ND	ND	ND	ND	ND	*												
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	*												
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	34												
Naphthalene	ND	1,900	1,000 J	12,000 E	3,500 J	4,700	2,200 J	2,100	2,200	ND	1,200	1,100	2,500	2,600	130						
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	ND	2.2												
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	*												
4-Chloro-3-methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	2.4												
2-Methylnaphthalene	ND	2,400	1,500 J	8,000 E	3,400 J	5,800 E	2,800 J	4,100 E	3,800	ND	2,000	1,900	3,000	3,800	364						
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	*												
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	*												
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	1												
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	*												
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	4.3												
Dimethylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	20												
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	410												
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	10												
3-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	5												
Acenaphthene	ND	90 J	ND	130 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	900						
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	*												
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	1												

#### Table 2 (cont'd)) Soil Analytical Results (ug/kg): Semi-Volatile Organic Compounds USEPA Method 8270

Sample ID	VS-4	VS-4	VS-4	VS-4 DUP	VS-6	VS-6 RE	VS-6	VS-6	VS-6 RE	VS-5	VS-5 DL	SL-1	SL-1 DL	USB-1	USB-1 DL	SW-1	SW-2	SW-2 RE	SW-3	SW-3 DL	NVSDEC
Sample Depth	0' - 4'	4' - 8'	8' - 12'	8' - 12'	0' - 4'	0' - 4'	4' - 8'	8' - 12'	8' - 12'	19' - 20'	19' - 20'	4' - 12'	4' - 12'	9'	9'	4' - 9'	4' - 9'	4' - 9'	4' - 9'	4' - 9'	Soil Cleanup
Dilution Factor	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	5:1	1:1	10:1 D	1:1	10:1 D	1:1	4:1 D	1:1	1:1	1:1	1:1	4:1 D	Guidalinas (nph) <sup>1</sup>
Sample Date	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	5/7/2003	5/7/2003	5/7/2003	5/7/2003	5/7/2003	5/7/2003	5/7/2003	Guidennes (ppb)
Dibenzofuran	ND	150	ND	350 J	ND	550 J	ND	610	500 J	ND	190 J	300 J	ND	350 J	62						
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	*												
Diethylphthalate	ND	100 J	ND	200 J	ND	ND	ND	ND	ND	ND	ND	ND	71								
4-Chlorophenyl-phenylether	ND	ND	ND	ND	ND	ND	ND	ND	*												
Fluorene	ND	230 J	240 J	530	ND	ND	ND	510	ND	ND	250 J	300 J	ND	500 J	3,500						
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	*												
4,6-Dinitro-2-methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	*												
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	ND	ND	ND	*												
4-Bromophenyl-phenylether	ND	ND	ND	ND	ND	ND	ND	ND	*												
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	14												
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	10												
Phenanthrene	ND	550	480 J	1,300	1,000 J	2,500	1,700 J	2,300	1,800	ND	650	700	1,300	1,200 J	2,200						
Anthracene	ND	81 J	ND	150 J	ND	ND	ND	230 J	ND	ND	70 J	650	120 J	ND	7,000						
Carbazole	ND	ND	ND	ND	ND	ND	ND	ND	*												
Di-n-butylphthalate	ND	520	440 J	920	970 J	1,700	1,600 J	1,800	1,600	ND	720	730	1,300	1,300 J	81						
Fluoranthene	ND	68 J	ND	43 J	ND	110 J	ND	ND	ND	ND	91 J	58 J	88 J	ND	19,000						
Pyrene	ND	63 J	ND	73 J	ND	360 J	ND	200 J	ND	ND	60 J	61 J	150 J	ND	6,650						
Butylbenzylphthalate	ND	77 J	ND	300 J	ND	1,100	ND	630	300 J	ND	88 J	110 J	370 J	ND	1,215						
3,3-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	*												
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	46 J	ND	30												
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND	40												
bis(2-Ethylhexyl)phthalate	ND	ND	61 J	ND	ND	38 J	ND	1,600	1,300 J	12,000 E	7,300	22,000 E	14,000	4,700 E	4,400	ND	1,300	1,400	3,600 J	3,300	4,350
Di-n-octyl phthalate	ND	180 J	ND	270 J	ND	ND	ND	ND	ND	ND	ND	ND	1,200								
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	2												
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	2												
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	2												
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	2												
Dibenz(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	1,650,000												
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	ND	8,000												
Total SVOC's	0	0	61	0	0	38	0	8,164	4,960	39,987	20,690	109,220	56,450	19,480	17,100	0	6,619	7,309	12,654	13,050	
Total TIC's	9,500	12,000	17,800	13,730	7,100	0	3,900	41,000	0	42,180	0	84,100	0	27,380	0	5,340	25,120	0	25,400	0	
Total SVOC's and TIC's	9,500	12,000	17,861	13,730	7,100	38	3,900	49,164	4,960	82,167	20,690	193,320	56,450	38,060	17,100	5,340	31,739	7,309	34,454	13,050	
Notes:																					

TAGM 4046 Guidance values (allowable soil concentration) are listed where applicable.
ND - Not Detected. CHEMTECH uses the qualifier "U" for analyzed non-detect compounds in its laboratory analyses.

3. No TAGM Soil Guidance value for this compound.

Data Reporting Qualifiers:

J: Indicates an estimated value. This flag is used when the mass spectral data indicated the identification, however the result was less than the specified detection limit was greater than zero. E: Indicates the analyte's concentration exceeds the calibrated range of the instrument for that specific analysis. D: This flag identifies all compounds identified in an analysis at a secondary dilution factor.

#### Table 3 Soil Analytical Results (mg/kg): TAL Metals **USEPA Method SW-846**

Sample ID	VS-4	VS-4	VS-4	VS-4 DUP	VS-6	VS-6	VS-6	VS-5	SL-1	USB-1	SW-1	SW-2	SW-3	
Sample Depth	0' - 4'	4' - 8'	8' - 12'	8' - 12'	0' - 4'	4' - 8''	8' - 12'	19' - 20'	4' - 12'	9'	4' - 9'	4' - 9'	4' - 9'	Eastern USA
Dilution Factor	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	background mg/kg
Sample Date	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	12/2/2002	5/7/2003	5/7/2003	5/7/2003	5/7/2003	iiig/kg
Aluminum	5,180 *	3,140 *	1,530 *	1,740 *	5,890 *	6,220 *	1,640 *	1,230 *	3,240 *	2,000	6,380	4,200	2,560	33,000
Antimony	$ND^1$	ND	ND	ND	0.56 B	ND	1.2 B	1.3 B	130	12.8	0.67 B	1.3 B	5.2 B	*2
Arsenic	1.5	1.1	ND	ND	2.0	5.5	0.46 B	0.64 B	6.3	ND	2.5	1.3	0.58 B	3 - 12 ** <sup>3</sup>
Barium	17.5 B	10.2 B	5.2 B	7.7 B	20.0 B	19.8 B	6.1 B	13.7 B	935	21.0 B	23.9	21.9 B	15.9 B	15 - 600
Beryllium	0.27 B	0.18 B	0.13 B	0.16 B	0.29 B	0.46 B	0.12 B	0.14 B	0.24 B	0.07 B	0.23 B	0.22 B	0.11 B	0 - 1.75
Cadmium	ND	0.07 B	ND	0.96	3.8	21	0.22 B	0.06 B	64.6	3.6	1.5	0.28 B	2.9	0.1 - 1
Calcium	539	395 B	324 B	369 B	842	493 B	348 B	352 B	20,300	693	806	1,240	1,170	130 - 35,000 **
Chromium	7.5 *	11.9 *	6.2 *	18.5	8.4 *	23.5 *	146 *	159 *	13,500 *	1,210	44.4	156	493	1.5 - 40**
Cobalt	3.6 B	1.3 B	1.3 B	2.4 B	2.7 B	5.3 B	1.5 B	2.6 B	7.2 B	1.4 B	3.3 B	3.4 B	2.0 B	2.5 - 60**
Copper	6.3	2.8	4.5	6.0	7.4	11.9	61.1	10.4	858	104	10.0	27.9	85.5	1 - 50
Iron	8,260	5,030	4,050	4,250	5,320	28,300	5,880	7,580	36,600	5,860	6,410	8,520	6,080	2,000 - 550,000
Lead	5.7	2.4	1.3	1.6	11.7	3.3	13.9	12.7	1,820	48.6	4.3	32.1	51.0	*** <sup>4</sup>
Magnesium	653	632	381 B	431 B	438 B	731	505 B	387 B	1,610	539 BN	1,280 N	869 N	819 N	100 - 5,000
Manganese	197 *E	22.9 *B	26.4 *B	24.5 *E	44.6 *E	109 *E	23.2 *E	40.9 *E	174 *E	24.2 N	63.6 N	348 N	41.3 N	50 - 5,000
Mercury	0.03	0.02	ND	ND	44.8	0.02	0.66	0.20	8.1	0.27 N	ND N	ND N	0.26 N	0.0001 - 0.2
Nickel	4.8	3.5 B	3.9 B	4.8 B	4.7	7.6	23.8	4.7 B	20.9	5.0	7.5	6.6	5.1	0.5 - 25
Potassium	179 BE	172 BE	159 BE	242 BE	225 BE	540 BE	245 BE	244 BE	517 BE	169 BE	261 BE	160 BE	148 BE	8,500 - 43,000**
Selenium	0.69	0.49 B	ND	ND	0.94	1.1	0.62	0.56 B	3.5	ND	ND	0.49 B	ND	0.1 - 3.9
Silver	ND	ND	ND	ND	ND	0.81 B	0.66 B	0.60 B	71.3	2.1	ND	0.59 B	1.9	*
Sodium	ND	43.5 B	ND	53.8 B	51.2 B	ND	ND	ND	319 B	124 B	91.7 B	102 B	123 B	6,000 - 8,000
Thallium	ND	ND	ND	ND	ND	0.83 B	ND	ND	3.4	ND	ND	ND	ND	*
Vanadium	8.9 N	12.2 N	5.0 BN	3.8 BN	8.7 N	10.3 N	6.3 N	6.7 N	7.6 BN	5.0 B	11.9	7.7	5.6	1 - 300
Zinc	11.9 N	16.7 N	7.0 N	10.6 N	62.2 N	117 N	14.9 N	10.5 N	638 N	82.7 N	64.0 N	55.1 N	82.9 N	9 -50

Notes:

ND - Not Detected. CHEMTECH uses the qualifier "U" for analyzed non-detect chemicals in its laboratory analyses.
No TAGM soil guidence value for this compound.

3. New York State background

4. Background levels for lead vary widely. Average levels in undeveloped, rural areas may range from 4 - 61 ppm. Average

levels in metropolitan or surburban areas or near highways are much higher and typically range from 200 - 500 ppm.

Data Reporting Qualifiers:

B: If the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL).

E: The reported value is estimated because of the presence of interference.

N: Spiked sample recovery not within control limits. \*: Duplicate analysis not within control limits.

# Table 4Soil Analytical Results (mg/kg): Hexavalent ChromiumUSEPA Method SW-7196A

Sample ID	USB-1	SW-1	SW-2	SW-3
Sample Depth	9'	4' - 9'	4' - 9'	4' - 9'
Sample Date	5/7/2003	5/7/2003	5/7/2003	5/7/2003
PARAMETER - mg/kg				
Hexavalent Chromium	17	$ND^1$	22	ND

Notes: 1. ND - Not Detected
# Table 8Groundwater Analytical Results (ug/l): Aquifer ProfileVolatile Organic Compounds: USEPA Method 8260

Sample ID	AP-7	AP-7	AP-7	AP-7	NYSDEC
Sample Depth	77' - 81'	61' - 65'	41' - 45'	16' - 20'	Groundwater
Sample Date	3/10/2003	3/10/2003	3/10/2003	3/10/2003	Standards
Dichlorodiflouromethane	$ND^1$	ND	ND	ND	$5^2$
Chloromethane	ND	ND	ND	ND	*3
Vinyl Chloride	ND	ND	ND	ND	2
Bromomethane	ND	ND	ND	ND	$5^2$
Chloroethane	11	ND	ND	ND	$5^2$
Trichloroflouromethane	ND	ND	ND	ND	5 <sup>2</sup>
1,1-Dichloroethene	11	ND	ND	ND	5 <sup>2</sup>
Methylene Chloride	10	ND	ND	ND	5 <sup>2</sup>
t-1,2-Dichloroethene	ND	ND	ND	ND	$5^{2}$
1,1-Dichloroethane	3300	1500	700	690	$5^2$
2,2-Dichloropropane	ND	ND	ND	ND	$5^2$
c-1,2-Dichloroethene	ND	ND	ND	ND	$5^2$
Bromochloromethane	ND	ND	ND	ND	$5^2$
Chloroform	ND	ND	ND	ND	7
1,1,1-Trichloroethane	1500	500	280	230	$5^2$
Carbon Tetrachloride	ND	ND	ND	ND	5
1,1-Dichloropropene	ND	ND	ND	ND	*
Benzene	ND	ND	ND	ND	1
1,2-Dichloroethane	ND	ND	ND	ND	0.6
Trichloroethylene	35	22	14	ND	$5^{2}$
1,2-Dichloropropane	ND	ND	ND	ND	1
Dibromomethane	ND	ND	ND	ND	$5^2$
Bromodichloromethane	ND	ND	ND	ND	*
c-1,3-Dichloropropene	ND	ND	ND	ND	$0.4^{4}$
Toluene	600	450	220	160	$5^2$
t-1,3-Dichloropropene	ND	ND	ND	ND	$0.4^{4}$
1,1,2-Trichloroethane	ND	ND	ND	ND	1
Tetrachloroethene	280	470	220	160	5 <sup>2</sup>
1,3-Dichloropropane	ND	ND	ND	ND	5 <sup>2</sup>
Chlorodibromomethane	ND	ND	ND	ND	*
1,2-Dibromoethane	ND	ND	ND	ND	*
Chlorobenzene	ND	ND	ND	ND	$5^2$
Ethyl Benzene	29	36	18	17	$5^2$
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	5 <sup>2</sup>
m+p Xylene	94	130	64	50	$5^2$
o Xylene	46	58	27	23	5 <sup>2</sup>

#### Table 8 (Continued) Groundwater Analytical Results (ug/l): Aquifer Profile Volatile Organic Compounds: USEPA Method 8260

Sample ID	AP-7	AP-7	AP-7	AP-7	NYSDEC
Sample Depth	77' - 81'	61' - 65'	41' - 45'	16' - 20'	Groundwater
Sample Date	3/10/2003	3/10/2003	3/10/2003	3/10/2003	Standards
Styrene	ND	ND	ND	ND	$5^{2}$
Bromoform	ND	ND	ND	ND	*
Isopropylbenzene	ND	ND	ND	ND	$5^2$
Bromobenzene	ND	ND	ND	ND	$5^2$
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	$5^{2}$
1,2,3-Trichloropropane	ND	ND	ND	ND	0.04
n-Propylbenzene	ND	ND	ND	ND	$5^2$
2-Chlorotoluene	ND	ND	ND	ND	$5^2$
1,3,5-Trimethylbenzene	27	58	36	25	$5^2$
4-Chlorotoluene	ND	ND	ND	ND	$5^2$
tert-Butylbenzene	ND	ND	ND	ND	$5^2$
1,2,4-Trimethylbenzene	72	160	88	63	$5^2$
sec-Butylbenzene	ND	ND	ND	ND	$5^2$
p-Isopropyltoluene	ND	ND	ND	ND	5 <sup>5</sup>
1,3-Dichlorobenzene	ND	ND	ND	ND	3
1,4-Dichlorobenzene	44	110	59	38	3
n-Butylbenzene	ND	ND	ND	ND	$5^2$
1,2-Dichlorobenzene	600	1300	640	450	3
Dibromochloropropane	ND	ND	ND	ND	*
1,2,4-Trichlorobenzene	ND	ND	ND	ND	$5^2$
Hexachlorobutadiene	ND	ND	ND	ND	0.5
Naphthalene	23	42	35	23	$10^{5}$
1,2,3-Trichlorobenzene	ND	ND	ND	ND	$5^2$
ter. ButylMethylEther	ND	ND	ND	ND	$10^{5}$
p-Ethyltoluene	26	52	31	26	*
Freon 113	ND	ND	ND	ND	5 <sup>5</sup>
1,2,4,5-Tetramethylbenzene	ND	16	20	ND	*
Acetone	100	ND	ND	ND	$50^{5}$
Methyl Ethyl Ketone	ND	ND	ND	ND	*
Methylisobutylketone	ND	ND	ND	ND	*
Chlorodiflouromethane	ND	ND	ND	ND	*
P-Diethylbenzene	ND	54	39	29	*

Notes: 1. ND - Not Detected

(POC) - Principal Organic Contaminant
 \* - No groundwater standard for this compound

4. Applies to the sum of cis- and trans-1,3-dichloropropene

5. TAGM applicable but no groundwater standard

# Table 5 Analytical Results (ug/L): Volatile Organic Compounds USEPA Method 8260

Sample ID	Rinseblank	Tripblank	NYSDEC
Dilution Factor	1:1	1:1	Groundwater
Sample Date	12/2/2002	12/2/2002	Standards (ppb)
Dichlorodifluoromethane	ND <sup>1</sup>	ND	$5^{2}$
Chloromethane	ND	ND	*3
Vinyl Chloride	ND	ND	2
Bromomethane	ND	ND	$5^{2}$
Chloroethane	ND	ND	$5^{2}$
Trichlorofluoromethane	ND	ND	$5^{2}$
1,1,2-Trichlorotrifluoroethane	ND	ND	*
Tert butyl alcohol	ND	ND	*
1,1-Dichloroethene	ND	ND	5 <sup>2</sup>
Acrolein	ND	ND	5 <sup>2</sup>
Acrylonitrile	ND	ND	5 <sup>2</sup>
Acetone	ND	ND	$50^{4}$
Carbon Disulfide	ND	ND	$50^{4}$
Methyl tert-butyl Ether	ND	ND	*
Methylene Chloride	ND	ND	5 <sup>2</sup>
trans-1,2-Dichloroethene	ND	ND	5 <sup>2</sup>
Vinyl Acetate	ND	ND	*
1,1-Dichloroethane	ND	ND	5 <sup>2</sup>
2-Butanone	ND	ND	$50^{4}$
Carbon Tetrachloride	ND	ND	5
2,2-Dichloropropane	ND	ND	$5^2$
cis-1,2-Dichloroethene	ND	ND	$5^{2}$
Bromochloromethane	ND	ND	$5^2$
Chloroform	ND	ND	7
1,1,1-Trichloroethane	ND	ND	$5^2$
1,1-Dichloropropene	ND	ND	*
Benzene	ND	ND	1
1,2-Dichloroethane	ND	ND	.6
Trichloroethene	ND	ND	*
1,2-Dichloropropane	ND	ND	1
Dibromomethane	ND	ND	5 <sup>2</sup>
Bromodichloromethane	ND	ND	*
4-Methyl-2-Pentanone	ND	ND	50 <sup>4</sup>
Toluene	ND	ND	5 <sup>2</sup>
t-1,3-Dichloropropene	ND	ND	0.44
cis-1,3-Dichloropropene	ND	ND	$0.4^{4}$
1,1,2-Trichloroethane	ND	ND	1
1,3-Dichloropropane	ND	ND	$5^2$

#### Table 5 (cont'd) Analytical Results (ug/L): Volatile Organic Compounds **USEPA Method 8260**

Sample ID	Rinseblank	Tripblank	NYSDEC
Dilution Factor	1:1	1:1	Groundwater
Sample Date	12/2/2002	12/2/2002	Standards (ppb)
2-Chloroethyl vinyl ether	ND	ND	*
2-Hexanone	ND	ND	*
Dibromochloromethane	ND	ND	$50^{4}$
1,2-Dibromoethane	ND	ND	*
Tetrachloroethene	ND	ND	5 <sup>2</sup>
Chlorobenzene	ND	ND	5 <sup>2</sup>
1,1,1,2-Tetrachloroethane	ND	ND	5 <sup>2</sup>
Ethyl Benzene	ND	ND	5 <sup>2</sup>
m/p-Xylenes	ND	ND	5 <sup>2</sup>
o-Xylene	ND	ND	5 <sup>2</sup>
Styrene	ND	ND	5 <sup>2</sup>
Bromoform	ND	ND	*
Isopropylbenzene	ND	ND	5 <sup>2</sup>
1,1,2,2-Tetrachloroethane	ND	ND	5 <sup>2</sup>
1,2,3-Trichloropropane	ND	ND	.04
Bromobenzene	ND	ND	5 <sup>2</sup>
N-propylbenzene	ND	ND	$5^{2}$
2-Chlorotoluene	ND	ND	5 <sup>2</sup>
1,3,5-Trimethylbenzene	ND	ND	5 <sup>2</sup>
4-Chlorotoluene	ND	ND	5 <sup>2</sup>
tert-Butylbenzene	ND	ND	5 <sup>2</sup>
1,2,4-Trimethylbenzene	ND	ND	5 <sup>2</sup>
Sec-butylbenzene	ND	ND	5 <sup>2</sup>
p-Isopropyltoluene	ND	ND	5 <sup>4</sup>
1,3-Dichlorobenzene	ND	ND	3
1,4-Dichlorobenzene	ND	ND	3
n-Butylbenzene	ND	ND	$5^{2}$
1,2-Dichlorobenzene	ND	ND	3
1,2-Dibromo-3-Chloropropane	ND	ND	*
1,2,4-Trichlorobenzene	ND	ND	$5^{2}$
Hexachlorobutadiene	ND	ND	0.5
Naphthalene	ND	ND	$10^{4}$
1,2,3-Trichlorobenzene	ND	ND	$5^{2}$
Total VOCs	0	0	
Total TICs	0	0	
Total VOCs and TICs	0	0	

 Notes:

 1. ND - Not Detected

 2. (POC) - Principal Organic Contaminant

 3. \* - No groundwater standard for this compound

 4. TAGM applicable but no groundwater standard

#### Table 6 Analytical Results (ug/L): Semi-Volatile Organic Compounds USEPA Method 8270

Sample ID	Rinseblank	NYSDEC
Dilution Factor	1:1	Soil Cleanup
Sample Date	12/2/2002	Guidelines (ppb)
Phenol	ND <sup>1</sup>	1
bis(2-Chloroethyl)ether	ND	*2
2-Chlorophenol	ND	8
1,2-Dichlorobenzene	ND	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene	ND	3
2-Methylphenol	ND	54
2,2-oxybis(1-Chloropropane)	ND	*
3+4-Methylphenols	ND	50 <sup>4</sup>
N-Nitroso-di-n-propylamine	ND	*
Hexachloroethane	ND	0.6
Nitrobenzene	ND	0.4
Isophorone	ND	50 <sup>4</sup>
2-Nitrophenol	ND	54
2,4-Dimethylphenol	ND	1
bis(2-Chloroethoxy)methane	ND	5 <sup>3</sup>
2,4-Dichlorophenol	ND	14
1,2,4-Trichlorobenzene	ND	5 <sup>3</sup>
Naphthalene	ND	10 <sup>4</sup>
4-Chloroaniline	ND	54
Hexachlorobutadiene	ND	.5
4-Chloro-3-methylphenol	ND	54
2-Methylnaphthalene	ND	50 <sup>4</sup>
Hexachlorocyclopentadiene	ND	$5^{3}$
2,4,6-Trichlorophenol	ND	$1^4$
2,4,5-Trichlorophenol	ND	14
2-Chloronaphthalene	ND	*
2-Nitroaniline	ND	5 <sup>4</sup>
Dimethylphthalate	ND	50 <sup>4</sup>
Acenaphthylene	ND	$20^{4}$
2,6-Dinitrotoluene	ND	5 <sup>3</sup>
3-Nitroaniline	ND	$5^4$
Acenaphthene	ND	$20^{4}$
2,4-Dinitrophenol	ND	54

#### Table 6 (cont'd) Analytical Results (ug/L): Semi-Volatile Organic Compounds USEPA Method 8270

Sample ID	Rinseblank	NYSDEC
Dilution Factor	1:1	Soil Cleanup
Sample Date	12/2/2002	Guidelines (ppb)
4-Nitrophenol	ND	54
Dibenzofuran	ND	54
2,4-Dinitrotoluene	ND	5 <sup>3</sup>
Diethylphthalate	ND	$50^{4}$
4-Chlorophenyl-phenylether	ND	*
Fluorene	ND	50 <sup>4</sup>
4-Nitroaniline	ND	54
4,6-Dinitro-2-methylphenol	ND	*
N-Nitrosodiphenylamine	ND	*
4-Bromophenyl-phenylether	ND	*
Hexachlorobenzene	ND	0.04
Pentachlorophenol	ND	14
Phenanthrene	ND	50 <sup>4</sup>
Anthracene	ND	50 <sup>4</sup>
Carbazole	ND	*
Di-n-butylphthalate	ND	50
Fluoranthene	ND	50 <sup>4</sup>
Pyrene	ND	50 <sup>4</sup>
Butylbenzylphthalate	ND	$50^{4}$
3,3-Dichlorobenzidine	ND	*
Benzo(a)anthracene	ND	$0.002^{4}$
Chrysene	ND	$0.002^{4}$
bis(2-Ethylhexyl)phthalate	ND	5
Di-n-octyl phthalate	ND	50 <sup>4</sup>
Benzo(b)fluoranthene	ND	$0.002^{4}$
Benzo(k)fluoranthene	ND	$0.002^{4}$
Benzo(a)pyrene	ND	ND
Indeno(1,2,3-cd)pyrene	ND	$0.002^{4}$
Dibenz(a,h)anthracene	ND	$50^{4}$
Benzo(g,h,i)perylene	ND	$5^4$
Total SVOC's	0	
Total TIC's	8.2	
Total SVOC's and TIC's	8.2	

Notes:

1. ND - Not Detected

2. No Groundwater Standard for this compound.

3. (POC) - Principal Organic Contaminant

4. TAGM applicable but no groundwater standard

#### Table 7 Analytical Results (ug/L): TAL Metals USEPA Method SW-846

Sample ID	Rinseblank	NWODEC Commission
Dilution Factor	1:1	NYSDEC Groundwater
Sample Date	12/2/2002	- Standards (ug/L)
Aluminum	$ND^1$	*2
Antimony	ND	3
Arsenic	ND	25
Barium	ND	*
Beryllium	ND	*
Cadmium	ND	5
Calcium	7.9 B	*
Chromium	ND	50
Cobalt	2.0 B	*
Copper	ND	200
Iron	12.2 B	300
Lead	ND	25
Magnesium	11.0 B	*
Manganese	0.66 B	300
Mercury	ND	0.7
Nickel	ND	100
Potassium	ND	*
Selenium	ND	10
Silver	ND	50
Sodium	ND	20,000
Thallium	ND	*
Vanadium	ND	*
Zinc	ND	*

Notes:

1. ND - Not Detected

2. No Groundwater Standard for this compound.

<u>Appendix C</u>

Manifests

INVOICE ID: ZUIUDIOZ Receipt ID: 376435 Manifest: MI8127594 Required under suthonly of Rart 111 and Part 121 of 4ct (S1) 1944 as imported. Failure to file max publicst you to criminal and/or civil ponsities under Sections 324,11151 or 324,12118 MCL 115616 WASTE MANAGEMENT DIVISION MICHIGAN DEPARTMENT OF DO NOT WRITE IN THIS SPACE ENVIRONMENTAL QUALITY REJ. D PR. D DIS. ATT. 🗆 BRO 18497 Form Appr **UNIFORM HAZARDOUS** 1. Generator's US EPA ID No. Manife Page Information in the shaded areas ris not required by Federal law. D0089 23526 2757 of / WASTE MANIFEST 3. Generator's Name and Malling Address Sid Havve A State Manifest Document Number MI 812.7594 1 rics wel RESPONSE inco Avenue 00 B. State Generator's ID al tream Simme ..... Generator's Phone 15/6 -US FPA ID Number State Transporter's ID A TTAL T 34 5 Transporter 1 Company Name NICTIONAL R. Transporter 2 Company Name 98660739 D: Transportar's Phone 722: 4234 7: US EPA ID Number E. State Transporter's ID R. 置 F. Transporter Phone B. Designated Facility Name and Site Address Michigan Waste Treatment Aunt 49350 N. I 84, Service Drive US EPA ID Number G. State Facility's ID. DHA JOST CIT THE 1. 1.1 12 2 ۲. ٠. H. Facility's Phone MI 48/11 Belleville MID00072483 734-329-8000 ... 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID NUMBER). 12. Containers 14. Unit 1. Wante Ę Total No. Туре HM Quantity No. STATE. WINC Hazardous Waste Solid, N.O.S. 0007 5 04 M 001 rax. 뒁 GENER b 5 -00-252-000 ATDR C., er lagade a 1 ~ 1 ÷ -si e-IAN AT d. 常 k n yr i'r ny faig 17.0 SPAC. 1 i: .ā -J. Additional Descriptions for Materials Listed Abo K. Handling Codes -**BYSTEH** \* . . . Sollen Sale. So ... vate 12. and a second s F1 .... . . . gri. ALERTING n navel a National States and a state of the states of Notice and William Programs of the sec 4 and the . ... Series and the series of 14 Vin . · · · 3 · · · · 15. Special Handling Instructions and Additional Information D/a-le# T64-519 EMERGENCY Approval -1105 16. GENERATOR'S CERTIFICATION: I hereby doclare that the contents of this consignment are fully and accurately described above by proper simplify agrice and stores in proper opnition for transport by highway according to applicable international and retional government regulations. If I am a large suddity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically precised enternative available to the selected international store and toxicity of waste generated to the degree I have determined to be economically precised enternative available to the selected international and future to the degree I have determined to be economically precised enternative available to the expression and solution of the times a selected in proper selected in the precise of the times and the precise of the selected in the time available to me which many available to me which the precise of the times and the precise of the times and the precise of the times and the precise of the selected in the selected in the precise of the times and the precise of the selected in the selected in the precise of the times and the precise of the selected in the POLLUTION WILLIAM MENDOZA Printed/Typed Name Date **DAH** Signature Month Day Yea 1 MENDOZA U 0142-0 b.K WILLIAM TO THE 17. Transporter 1 Acknowledgement of Becelpt of Materials TRANK Date FAUL BUZMAN 200 Yea ORTED 24 HOUR Transporter 2 Acknowledgement of Receipt of Materials Date Printed/Typed Name Signature Month Dav Yəar į 1 1 19. Discrepancy Indication Space γ. ÷. 20. Facility Owner or Operator: Carification of receipt of haz downsterials covered by this manifest except as noted in Item 19. 1 18.5 Date ..... Month Day Yes 14260 1 ŝ, in the BURNIN ST ¥ 4 6.4 1.34

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J. 15. 16. 17. 16. 18. ₽ 18.	Soil Contaminated Soil Contaminated Soll Contaminated Special Handling Instructions and Add Approval GENERATOR'S CERTIFICATION: I hereby der packed, marked, and labeled, and are in all re packed, marked, and labeled, and are in all re present and future threat to human health generation and select the best waste manage Printed/Typed Name M, LLI DM MENT Transporter 1 Acknowledgement of Re Printed/Typed Name EFRATIN SANC Transporter 2 Acknowledgement of Re Printed/Typed Name	W Solven gallow Overn litional Information II OSOZ clare that the contants of sepects in proper condition that I have a program have selected the pract of the environment: generat method that is av DZ/J acceipt of Materials	ts Pack drum MCB Z4 Hour this consignment are fully and as in for transport by highway acco In place to roduce the volume cable melbod of treatment, et OR; If I am a small quantity eilable to me and that I can affec Signature Signature Signature	Emery coursely desc rding to eppli orago, or di generator, 11 ord.	ck mibed abo sabio inter ave mer maxemer ma	0M Tel ±. ve by proper ship rnational and nai generated to the rrently available to a good faith of many second faith of man	232- pping nam ional gove to mak we effort to in in ional gove to mak we effort to in in ional gove ional gove	A b c c d d 424-8 regula 1 have detar rhich minimize minimize my Dato Month Day 0 8 1 2 Date Month Day 0 8 1 2 Date Month Day 0 8 1 2 Date
J. ₹ 15. 16. 17. 18. 18. 18. 18. 18.	Soil Contaminated Soil Contaminated Includes one 85 g Special Handling Instructions and Add Approval # GENERATOR'S CENTIFICATION: I hereby der packed, marked, and labeled, and are in all re if I am a large quantity generator, I certify to be economically practicable and that I present and future threat to human healti generation and select the best waste manage Printed/Typed Name W, LLI DM MENT Transporter 1 Acknowledgement of Re Printed/Typed Name EFRATIN SAWC Transporter 2 Acknowledgement of Re Printed/Typed Name	W Solven gallow Overn litional Information II OSOZ clare that the contants of pespecies in proper condition have solucted the pract have solucted the	Acck drum Pack drum MCB Z4 Hour this consignment are fully and as in place to reduce the volume icable method of treatment, et icable method of treatment, et icable method of treatment, et Signature Signature Signature Signature Signature	Lener Emerge coursely desc rding to applic to rego, or dis generator, 11 srd.	CK mCy ribed abo sable inte of wast uposel cu ave mac mac mac mac mac mac mac mac	CM Tel ±. Tel ±. Tel the second secon	232- oping namional gove to ma w effort to in A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4	A b c c d d d d d d d d d d d d d
J. J. 15. 15. 16. 17. 17. 17. 18. 18. 18. 19.	Soil Contaminated Soil Contaminated Special Handling Instructions and Add Approval # GENERATOR'S CENTIFICATION: I hareby der packed, marked, and labeled, and are in all re packed, marked, and labeled, and are in all re if I am a large quantity generator, I certific to be economically practicable and that I present and future threat to human health generation and select the best waste manage Printed/Typed Name W, LLI DM MENT Transporter 1 Acknowledgement of Re Printed/Typed Name EFRATIN SAWC Transporter 2 Acknowledgement of Re Printed/Typed Name Discrepancy Indication Space	W Solven gallon Over litional Information II OSO2 clare that the contents of especis in proper condition that I have a program have solocted the pract is and the environment; geneent method that is av DZIA sceipt of Materials	Acck drum (Do MCB 24 Hour this consignment are fully and as in place to reduce the volume icable method of treatment, et in place to reduce the volume icable method of treatment, et Bignature Signature Signature Signature Signature	Emergy courately desc rding to appli- a and toxicity orago, or di generator, 1 1 std.	CK Incy Index about the second Index and the second Inter a second	0M Tel H. pore by proper shift p generated to the prational and nation generated to the pratical shift of the second faith of the second faith of the second faith of the second faith of the the second faith of the second faith	A A A A A A A A A A A A A A A A A A A	A b c c d d d d d d d d d d d d d
J. 15. 15. 16. 17. 18. 18. 19. 19.	Soil Contaminated Soil Contaminated Soil Contaminated Special Handling Instructions and Add Approval # GENERATOR'S CERTIFICATION: I hereby dec packed, marked, and labeled, and are in all re- gracked, marked, and labeled, and are in all re- gracked, marked, and labeled, and are in all re- to be economically practicable and that i present and future threat to human health generation and select the best wastermaneg Printed/Typed Name W, LLI DM MENT Transporter 1 Acknowledgement of Re- Printed/Typed Name EFRAME SAWC Transporter 2 Acknowledgement of Re- Printed/Typed Name Discrepancy Indication Space	W Solven gallow Over litional Information II OSOZ clare that the contants of sepects in proper condition y that I have a program have solicited the pract hand the environment; rement mathod that is av DZIZ accept of Materials	Acck drum (Do MCB 24 Hour this consignment are fully and as in place to roduce the volume cable method of treatment, at OR; If I am a small quantity signature Signature Signature Signature	Emery courselely desc rding to eppli- o and toxicity orago, or di generator, 11 ora.	ck mcy ribed abd sable inte of wast have mac mac mac mac mac mac mac mac	0M Tel ±. ve by proper ship rnational and nai orgenerated to th rrently available fo a good faith th manual ship manual ship ship manual ship manual s	232- pping nam ional gove to ma w effort to M A A A A A A A A A A A A A A A A A A	A C C C C C C C C C C C C C
J. ↓ 15. 16. 16. 17. R 19. 19.	Soil Contaminated Soil Contaminated Soll Contaminated Special Handling Instructions and Add Approval # GENERATOR'S CERTIFICATION: I hereby der packed, marked, and labeled, and are in all re packed, marked, and labeled, and are in all re to be economically practicable and that I present and future threat to human health generation and select the best waste managed Printed/Typed Name Discrepancy Indication Space	W Solven gallow Over litional Information INOSOZ clare that the contants of the sepects in proper condition the solution of the pract in and the environment: generat method that is av WZ/J- sceipt of Materials	Ack drum Pack drum Do MCB Z4 Hour this consignment are fully and as in place to roduce the volume in place to roduce the volume off; If I am a small quantity eilable to me and that I can affec Signature Signature Signature Signature	Emery coursely desc rding to eppli orago, or di generator, 11 ord.	CK mibed abd sable inte of wast- sposal cu ave med	0M Tel ±. vve by proper ship rnational and national generated to the rrently available to a good faith of many	232- pping naminal gove ne degree to ma w effort to in M	A b: c c d c c c c c c c c c c c c c
J. 15. 16. 17. 17. 18. 19. 19. 19. 20.	Soil Contaminated Soil Contaminated Includes one 85 d Special Handling Instructions and Add Approval # GENERATOR'S CERTIFICATION: I hareby der packed, marked, and labeled, and are in all re if I am a large quantity generator, I certific to be economically practicable and that I present and luture threat to human health generation and select the best waste manage Printed/Typed Name W, LLI DM MENT Transporter 1 Acknowledgement of Re Printed/Typed Name EFRATIN SAWC Transporter 2 Acknowledgement of Re Printed/Typed Name EFRATIN SAWC Transporter 2 Acknowledgement of Re Printed/Typed Name EFRATIN SAWC Transporter 2 Acknowledgement of Re Printed/Typed Name Discrepancy Indication Space	Control of the second s	Acck drum Pack drum MCB 24 Hour this consignment are fully and an in place to reduce the volume icable method of treatment, at place to reduce the volume icable method of treatment, at place to reduce the volume icable method of treatment, at Signature Signature Signature Signature Signature	Lener coursely desc rding to applic torago, or dis generator, 11 ord.	CK mCy ribed abo sable inte of wast uposel cu ave mar mar except	as noted in	232- oping namional gove to ma w effort to in A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4 A 4	A b: c d c c c c c c c c c c c c c
J. J. 15. 16. 17. 18. 19. 19. 19.	Soil Contaminated Soil Contaminated The Cludes one 85 Special Handling Instructions and Add Approval # GENERATOR'S CERTIFICATION: I hareby der packed, marked, and labeled, and are in all re packed, marked, and labeled, and are in all re resources and future threat to human health generation and select the best waste manage Printed/Typed Name W, LLI DM MENT Transporter 1 Acknowledgement of Re Printed/Typed Name EFRATIN SAWC Transporter 2 Acknowledgement of Re Printed/Typed Name Discrepancy Indication Space Facility Owner or Operator: Certification term 18.	W Solven gallon Over litional Information II OSO2 clare that the contents of especis in proper condition y that I have a program have solicited the pract in and the environment; geneent method that is av D 2/1 sceipt of Materials	Acck drum Pack drum MCB 24 Hour this consignment are fully and as in place to reduce the volume cable method of treatment, at OR: If I am a small quantity p eitable to me and that I can affect Signature Signature Signature Signature	Lenery courately desc rding to applib and toxicity orago, or dis generator, 1 1 ord,	CK mCy ribed abd sabib inte of wast possi cu have met mat ave met ave	as noted in	232- pping namional gove to ma we effort to M	A b c c d C A A A A A A A A A A A A A
J. J. J. J. 15. 15. 16. 17. R N S P 18. T T T V V 19. 19. 17. 19. 19. 19. 19. 10. 10. 10. 10. 10. 10. 10. 10	Soil Contaminations for matching Soil Contamination Special Handling Instructions and Add Approval # GENERATOR'S CERTIFICATION: I hereby dec packed, marked, and labeled, and are in all re- gracked, marked, and labeled, and are in all re- to be economically practicable and that i present and future threat to human health generation and select the best wastermanes Printed/Typed Name W, LLI DM MENT Transporter 1 Acknowledgement of Re- Printed/Typed Name EFRAME SAWC Transporter 2 Acknowledgement of Re- Printed/Typed Name Discrepancy Indication Space Facility Owner or Operator: Certification Item 19. Printed/Typed Name	W Solven gallow Over litional Information II OSO2 clare that the contants of sepects in proper condition what I have a program have solocted the pract hand the environment; generat method that is av D 2/1 accept of Materials	Acck drum Pack drum Do MCB 24 Hour this consignment are fully and as in place to reduce the volume cable method of treatment, et OR; If I am a small quantity eitable to me and that I can affer Signature Signature Signature Signature	bee photos photo	CK mibed abd sable inte of wast have mer max except	OM Tel ±. ve by proper ship rnational and nail rrantly available fo a good faith of many as noted in	232- pping naminal governe degree to ma weiffort to in Manual Anti- Ant-	A b c c d C A A A A A A A A A A A A A
J. J. J. J. 15. 15. 16. 15. 16. 17. R R T R N S P O I 8. 19. 19. 19. 17. 19.	Soil Contaminations for matching Soil Contamination Special Handling Instructions and Add Approval GENERATOR'S CERTIFICATION: I hereby der packed, marked, and labeled, and are in all re packed, marked, and labeled, and are in all re to be economically practicable and thist I present and future threat to human health generation and select the best waste manage Printed/Typed Name Discrepancy Indication Space Facility Owner or Operator: Certification term 18. Printed/Typed Name	W Solven gallow Over litional Information INOSOZ clare that the contants of the sepects in proper condition they solocted the pract in and the environment: generat method that is av WZ/J- sceipt of Materials	ACK drum COO MCB Z4 Hour this consignment are fully and an in for transport by highway acco In place to roduce the volume cable method of treatment, et OR; If I am a small quantity eilable to me and that I can affec Signature Signature Signature Signature Signature Signature	bee ph Emerge coursely desc rding to applib orago, or di generator, 11 ord.	CK ribed abd sable inte of wast- uposal cu ave med M	as noted in	232- pping naminal gove to make welfort to in Manual for to in Manual for the in Man	A b c c d C A A A A A A A A A A A A A

# Appendix D

"As-Built" Drawings and Figures, Air Sparge and SVE System Control Diagrams, Well Construction Logs and Manufacturers' Equipment Manuals



As-Built Drawings

Air Sparge and SVE System Control Diagrams







DRAWING LEGEND	NORMALLY CLOSED CIRCUIT NORMALLY OPEN CIRCUIT PR× SPARGE SOLENOID VALVE RELAY S× SOLENOID VALVE	HR RUN-TIME METER FOR SOLENOID	REVISION #: 1.2 REVISION #: 1.2 PRAWN/REVISED BY: 0L REVISION DATE: 06-02-2006 E-3 DRAWING TITLE	DESIGN SCHEMATICS FOR PULSE CONTROL PANELS PCP1 AND PCP2 SID HARVEY INC. Valley Stream, New York Valley Stream, New York NAC Consultants, Inc. 28 Henry Street Kings Park, NY 11754	80-B Air Park Drive Ronkoma, New York 11779 Phone: (631) 471-1500 Fax: (631) 471-6367
	BECKER COMPRESSOR PULSE PANEL SCHEMATICS (PCP2)	PULSE CONTROL PARE	SCROLL COMPRESSOR PULSE PANEL SCHEMATICS (PCP1)	OWPRESSOR REGULATOR COMPRESSOR REGULATOR CTYPICAL FOR ALL SPARCE LINES)	

SCF 24V COMMON \_\_\_\_\_\_24V \_\_\_\_\_\_2 24V \_\_\_\_\_\_\_24V \_\_\_\_\_\_2 24V \_\_\_\_\_\_\_224V \_\_\_\_\_\_2 SCROLL COMPRE 24V COMMON \_\_\_\_\_\_24V \_\_\_\_\_\_24V \_\_\_\_\_\_24V \_\_\_\_\_\_\_24V \_\_\_\_\_\_\_\_\_24V \_\_\_\_\_\_\_\_24V \_\_\_\_\_\_24V \_\_\_\_\_20NTACT BLOC ON MS-2 IN MAIN CONTROL PANEL CP

Well Construction Logs

Sid Harvey Industries, Inc. Valley Stream New York

Onsite and Offsite Monitoring Well Logs

MONITORING WELL MW-1				
	CONSTRUCT	TION LOG		
		Well Number	MW-1	
Flush	mount Curb Box	NYSDEC Project	Voluntary Cleanup Program V-00145-1	
		Project	Environmental Site Assessment	
	Land Surface	Surveyor	Survey Date	
	Clean Fill	Land Surface Elevati	ion	
	1 Foot Below Grade	Measuring Point Ele	vation19.63 feet	
4	1/4         Inch Diameter Borehole           2         Inch Diameter Well Casing	Northing	Easting	
Sch. 40 P	Well Casing Material	Installation Date	December 21, 1998	
■ <u>8.5 - 9.5</u> A	pproximate Depth to Water (ft.)	Drilling Contractor	Tri-State Drilling, Inc. (Driller: P. Recchia)	
Bento	nite Grout	Drilling Method	Hollow Stem Auger	
	7 Feet Below Grade	Drilling Fluid	Water	
Bento	onite Pellet (TR-30 3/8") Seal	Fluid Loss During D	rilling (Est) 10 gallons	
	8 Feet Below Grade			
	10 Feet Below Grade	Development Techni	iques Overpumping/Surging	
	2 Inch Diameter Well Screen	Date(s) of Developm	December 23, 1998	
Sch. 40 P	VC Well Screen Material	Water Removed Dur	ing Development Approximately 17 gallons	
	<u>Filter Deels</u>	Depth to Water (Ft. b	pelow M.P.)	
	6 #2 Grain Size	Pumping Depth to W	/ater (Ft. below M.P.)	
	20 Feet Below Grade	Pumping Duration	Yieldgpm	
		Specific Capacity		
Notes: Total well depth as of 5/9/	03: 18.90 feet BLS	Hydrogeologist	K. McHale	
		Company	MAC CONSULTANTS, INC.	

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MONITORING WELL MW-2					
	CONSTRUCT	TION LOG			
	Well Cap	Well Number	MW-2		
	Flushmount Curb Box	NYSDEC Project	Voluntary Cleanup Program V-00145-1		
		Project	Environmental Site Assessment		
	Land Surface	Surveyor	Survey Date		
	Clean Fill	Land Surface Elevat	ion		
	Foot Below Grade	Measuring Point Ele	vation 18.58 feet		
	4-1/4 Inch Diameter Borehole 2 Inch Diameter Well Casing Null Quine March 1	Northing	Easting		
	Sch. 40 PVC well Casing Material	Installation Date	December 21, 1998		
<b></b>	8.5 - 9.5 Approximate Depth to Water (ft.)	Drilling Contractor	Tri-State Drilling, Inc. (Driller: P. Recchia)		
	Bentonite Grout	Drilling Method	Hollow Stem Auger		
	7 Feet Below Grade	Drilling Fluid	Water		
	Bentonite Pellet (TR-30 3/8") Seal	Fluid Loss During D	rilling (Est 10 gallons		
	8 Feet Below Grade				
	10 Feet Below Grade	Development Techni	iques Overpumping/Surging		
	2 Inch Diameter Well Screen	Date(s) of Developm	December 23, 1998		
	Sch. 40 PVC Well Screen Material	Water Removed Dur	ing Development Approximately 17 gallons		
		Depth to Water (Ft. 1	below M.P.)		
	Filter Pack WG #2 Grain Size	Pumping Depth to W	/ater (Ft. below M.P.)		
	20 Feet Below Grade	Pumping Duration	Yieldgpm		
		Specific Capacity			
Notes: Total well d	lepth measured on 5/9/03: 20.04 feet	Hydrogeologist	K. McHale		
		Company	MAC CONSULTANTS, INC.		

#### **CONSTRUCTION LOG**

well Cap	Well Number MW-3
rFlushmount Curb Box	NYSDEC Project Voluntary Cleanup Program V-00145-1
	Project Environmental Site Assessment
Land Surface	Surveyor Survey Date
Clean Fill	Land Surface Elevation
A 1/4 Inch Diamater Borehole	Measuring Point Elevation 19.39 feet
2 Sch. 40 PVC Well Casing Material	Northing Easting
$\mathbf{\nabla} = \frac{85 - 95}{100} \text{ Approximate Depth to Water (ff.)}$	Installation Date December 21, 1998
Bentonite Grout	Drilling Contractor Tri-State Drilling, Inc. (Driller: P. Recchia)
7 Feet Below Grade	Drilling Method Hollow Stem Auger
Bentonite Pellet (TR-30 3/8") Seal	Drilling Fluid Water
8 Feet Below Grade	Fluid Loss During Drilling (Est10 gallons
10 Feet Below Grade	Development Techniques Overpumping/Surging
2 Inch Diameter Well Screen	Date(s) of Development December 23, 1998
Sch. 40 PVC Well Screen Material	Water Removed During Development Approximately 17 gallons
	Depth to Water (Ft. below M.P.)
WG #2 Grain Size	Pumping Depth to Water (Ft. below M.P.)
20 Feet Below Grade	Pumping Duration Yieldgpm
	Specific Capacity
Notes: Total well depth measured on 5/9/03: 20.22 feet	Hydrogeologist K. McHale
	Company MAC CONSULTANTS, INC.

#### **CONSTRUCTION LOG**

	·····	- Well	Cap		Well Number	MW-31
		·····	Flushm	ount Curb Box	NYSDEC Project	Voluntary Cleanup Program V-00145-1
					Project	Operable Unit 2 Remedial Action Work Plan
				Land Surface	Surveyor	Survey Date
				Clean Fill	Land Surface Elevation	on
			3	Feet Below Grade	Measuring Point Elev	vation
1			3-1/4	Inch Diameter Borehole	Marthing	Forting
		Sc	40 PVC	Well Casing Material		
				_	Installation Date	March 2, 2005
		8.5	- 9.5 Approx	kimate Depth to Water (ft.)	Drilling Contractor	Phil Zackman, Jr R&L Drilling Company, Inc.
			Bentonite (	Grout		
		-	62	Feet Below Grade	Drilling Method	Hollow Stem Auger
		5		_	Drilling Rig	Deep Rock DR-50
		100 - 10 - 10 - 10 - 10 - 10 - 10 - 10			Drilling Fluid	Water
			Bentonite F	Pellet (TR-30 3/8") Seal		
		2. T	67	Feet Below Grade	Fluid Loss During Di	ritting (Est/ gallons
	_	1	70	Feet Below Grade	Development Techni	ques
			2	Inch Diameter Well Screen	Date(s) of Developm	ent
		Sc	h. 40 PVC	Well Screen Material	Water Removed Duri	ing Development
			10	_Slot Size	Depth to Water (Ft. b	pelow M.P.)
				Filter Pack		
			WG # 1	Grain Size	Pumping Depth to W	'ater (Ft. below M.P.)
			80	Feet Below Grade	Pumping Duration	Yieldgpm
		:	82	_Sump Feet Below Grade	Specific Capacity	
	<u>ana 1999</u>	4		-	Speenie Capacity	
Notes:	A two-foot su	imp wi	Il be installed	d below the bottom of the well	Engineer	Michael Milovich
	near the botto	om of th	ne screen		Company	NAC CONSULTANTS, INC.

	CONSTRUCTIO	<u>N LOG</u>			
Well Cap	W	Vell Number	MW-4		
Flushmount Curb Box	N	VYSDEC Project	Voluntary Cleanup	Program V-001	45-1
	P	roject	Environmental Site	Assessment	
	nd Surface S	Surveyor	Survey I	Date	
Clean Fill	L Grade	and Surface Elevatio	on		
root below	M	Aeasuring Point Elev	ation 18.91 fe	et	
4-1/4 Inch Diam 2 Inch Diam Sch. 40 PVC Well Casir	eter Borehole leter Well Casing N ng Material	Northing	Easting		
	Ir	nstallation Date	December 22, 199	8	
▼ 8.5 - 9.5 Approximate Dept	h to Water (ft.)	Drilling Contractor	Tri-State Drilling, I	nc. (Driller: P.	Recchia)
Bentonite Grout	<b>1</b>	Drilling Method	Hollow Stem Auge	r	
7 Feet Below	w Grade	Drilling Fluid	Water		
Bentonite Pellet (TR-30	0 3/8") Seai F	- fluid Loss During Dri	illing (Est 10 gallo	าร	
Feet Belov	w Grade				
	w Grade D	Development Techniq	ues Overpun	nping/Surging	
	eter Well Screen	Date(s) of Developme	nt Decemb	er 29, 1998	
Sch. 40 PVC Well Scree	en Material V	Water Removed Durin	ng Development	Approximate	y 17 gallons
	C I	Depth to Water (Ft. be	elow M.P.)		
Filter Pack	c P	Pumping Depth to Wa	ater (Ft. below M.P.)		
20_Feet Belov	w Grade P	Pumping Duration		Yield	gpm
	s	Specific Capacity			
Notes: Total well depth measured on 5/9/03: 19.78 f	feet H	Hydrogeologist	K. McHale		
	c	Company	MAC CONSULT.	ANTS, INC.	

# **CONSTRUCTION LOG**

Well Cap	Well Number MW-5
Fiushmount Curb Box	NYSDEC Project Voluntary Cleanup Program V-00145-1
	Project Environmental Site Assessment
Land Surface	Surveyor Survey Date
Clean Fill	Land Surface Elevation
1 Foot Below Grade	Measuring Point Elevation 19.06 feet
4-1/4 Inch Diameter Borehole 2 Inch Diameter Well Casing Sch 40 PVC Well Casing Material	Northing Easting
$\mathbf{V} = \frac{85 \times 95}{100} \text{ Approximate Depth to Water (ft)}$	Installation Date December 22, 1998
Bentonite Grout	Drilling Contractor Tri-State Drilling, Inc. (Driller: P. Recchia)
7 Feet Below Grade	Drilling Method Hollow Stem Auger
Bentonite Peilet (TR-30 3/8") Seal	Drilling Fluid Water
8 Feet Below Grade	Fluid Loss During Drilling (Est 10 gallons
10 Feet Below Grade	Development Techniques Overpumping/Surging
2 Inch Diameter Well Screen	Date(s) of Development December 29, 1998
Sch. 40 PVC Well Screen Material	Water Removed During Development Approximately 17 gallons
	Depth to Water (Ft. below M.P.)
WG #2 Grain Size	Pumping Depth to Water (Ft. below M.P.)
20 Feet Below Grade	Pumping Duration Yieldgpm
	Specific Capacity
Notes: Total well depth measured on 5/9/03: 18.72 feet	Hydrogeologist K. McHale
	Company MAC CONSULTANTS, INC.

MONITORING WELL							
CONSTRU	CONSTRUCTION LOG						
Protective Casing (Cover)	Well No.						
Concrete Pad	Client Project Surveyor	Sid Harvey, Inc. Voluntary Cleanup Project, Number	V-00145-1 Survey Date				
	Messuring Point Elevatio	n					
Clean Fill 2 Ft. Below Grade	Instalization Date	October 21, 2002					
1 Inch Diameter Borchole	Drilling Contractor Drilling Method	Delta Well & Pump Hollow Stam Auger					
2 Inch Diameter Well Casing Weil Casing Material	Drilling Fluid	Water					
Grout Barasso Type I Coment	Fluid Loss During Drillin	g (galz.)					
75 Ft. Below Grade	Development Technique(1	i) Submersible Pump					
Seal Type Bentonite Pellets	Dute(s) of Development	October 25, 2002	-				
FI. Below Grade	Water Removed During D	Development (gals)	74				
2 Inch Diameter Well Screen	Pumping Depth to Water	(ft. below M.P.)	12.45				
PVC Well Screen Material	Pumping Duration (total)	57 min,	-				
10 Slot Size	Yleid (gpm)		-				
Gravel Pitter Pack	pH Turbidity (NTU)	44.0	-				
90 Feet Bolow Grade Peet Bolow Grade	Temperature (deg. C.)	15.3	-				
	Conductivity (uS/cm)	406	-				
Nores	Well Purpose	Groundwater Monitoring					
	Hydrogeologist	Keith Milano		•			
	Сопералу	MAC CONSULTANTS, INC.					

MONITORING WELL							
CONSTRUCTION LOG							
Well No.     MW-6D       Client     Sid Harvey, Inc.       Project     Voluntary Cleanup Project, Number       Surveyor	- . V-00145-1 Survey Date						
Drilling Contractor <u>Deita Well &amp; Pump</u> Drilling Method <u>Hollow Stem Auger</u> Drilling Fluid <u>Water</u> Fluid Loss During Drilling (gals.)	-						
Development Technique(s) <u>Submersible Pump</u> Date(s) of Development <u>October 25, 2002</u> Water Removed During Development (gais) Depth to Water (ft. below M.P.)							
Pumping Depth to Water (ft. below M.P.)           Pumping Duration (total)         68 min.           Yield (gpm)         1.3           pH         6.1           Turbidity (NTU)         48.70	40.33						
Temperature (dog. C.)     14.2       Conductivity (uS/cm)     198.6       Well Purpose     Groundwater Monitoring       Hydrogeologist     Keith Milano	-						
	UNG WELL         CTION LOG         Well No.       MW-6D         Client       Sid Harvey, Inc.         Project       Voluntary Cleanup Project, Number         Surveyor						

MONITORING WELL							
CONSTRU	CONSTRUCTION LOG						
34	· · · · · · · · · · · · · · · · · · ·						
Protective Casing (Cover)	Well No.	MW-7S					
	Client	Sid Harvey, Inc.					
Concrete Pad	Project	Voluntary Cleanup Project, Number V-00145-1					
Land Surface	Surveyor	Survey Date					
	Mensuring Point Elevation	on					
Clean Fill Clean Fill FL Below Grade	Installation Date	September 20, 2002					
6 Inch Diameter Borrhole	Drilling Contractor	Delta Well & Pump					
	Drilling Method	Hollow Stem Auger					
PVC Well Casing Material	Drilling Fluid	Water					
Grout Barasso Type I Cement	Fluid Loss During Drittle	ng (gals.)					
	<u> </u>						
47 FL Below Grade	Development Technique	(a) Submersible Pump					
Seal Type Bentonite Pellets	Date(s) of Development	October 22, 2002					
49 Ft. Below Grade	Water Removed During	Development (gals)					
52 Ft, Below Grade	Depth to Water (ft, below	w M.P.) 10.98					
2 Inch Dismeter Weil Screen	Rumation Darah (a Wata						
	Pumping Depth to water	(IL DEIOW ML.F.) 11.24					
PVC Weil Sereen Material	Pumping Duration (total	) 12 min					
20 Slot Size	Yleld (gpm)	2.0					
Gravel Filter Pack	рН	6.3					
	Turbidity (NTU)	35.0					
62 Feet Below Grade	Temperature (dcg. C.)	15.4					
	Conductivity (uS/em)	353					
	Well Purpose	Groundwater Monitoring					
rate:	Hydrogeologist	Keith Milano					
	Company	MAC CONSULTANTS, INC.					

MONITORING WELL					
CONSTRU	CTION LOG				
Protective Casing (Cover)	Well No.	MW-71	-		
	Client	Sid Harvey, Inc.	-		
Concrete Pad	Project	Voluntary Cleanup Project, Number	r V-00145-1		
Land Surface	Surveyor		Survey Date		
	Measuring Point Elevado	n	-		
Clean Fill	Installation Date	September 20, 2002	_		
FL Below Grade	Drilling Contractor	Deita Well & Pump	_		
6 Inch Diameter Borchole	Drilling Method	Hollow Stem Auger	-		
2 Inch Diameter Well Casing	Drilling Fluid	Water	-		
Grout Barnsso Type I Cement	Field Loss During Drillin	g (gais.)			
75 FL Below Grade	Development Technique(s	) Submersible Pump			
Seal Type Bentonite Pellets	Date(s) of Development	October 22, 2002	-		
77 Ft. Below Grade	Water Removed During D	Development (gals)	100		
80 Ft. Below Grade	Depth to Water (ft. below	M.P.)	11.00		
2 Inch Diameter Weil Screen	Pumping Depth to Water	(ft. below M.P.)	12.50		
PVC Well Screen Material	Pumping Duration (total)	50 min.	_		
10 Slut Size	Yield (gpm)	2.0	_		
Gravel Filter Pack	рН	6.3			
W.Q. #] Grain Size	Turbidity (NTII)	49.7	-		
90 Feet Below Grade	Terroration (des. C.)	14.9	-		
	Temperature (ueg. C.)		-		
	Conductivity (uS/cm)	242			
	Well Purpose	Groundwater Monitoring			
Notes:	Hydrogeologist	Keith Milano			
	Сопралу	MAC CONSULTANTS, INC.			

MONITORING WELL					
CONSTRUC	CTION LOG				
Protocifus Course	Wall No				
(Cover)	Client	Sid Harray Inc			
Concrete Pad	Broingt	Volustasi Classic Project Number	V 00145.1		
Land Surface	Supervor	- volundity cleandp Hoject, Humber	Survey Date		
	Measuring Point Flavatio		Survey Date		
Class Fill	Installation Date	September (9, 2002			
FL Below Grade		Delta Well & Ruma			
inch and a second secon	Drilling Method	Hollow Stem Auser			
2 Inch Dismoter Well Casing	Dritting Fluid	Water			
Greut Baratso Type   Coment	Fluid Loss During Drilling	( esis.)			
135 FL Below Grade	Development Technique(s	) Submersible Pump			
Seal Type Bentonite Pellets	Date(s) of Development	October 22, 2002			
137 Ft. Below Grade 140 Ft. Below Grade	Water Removed During E	Development (gals)	65		
Inch Diameter Weil Screen	Depth to Water (ft. below	M.P.)	14.96		
	Pumping Depth to Water	(ft. below M.P.)	47.35		
PVC Well Screen Material	Pumping Duration (total)	32 min.			
10 Slot Size	Yield (gpm)	2.0			
Grave: Filter Pack W.G. HI Grain Size	рH ,	6.4			
150 Feet Below Grade	Turbidity (NTU)	30.2			
Feet Below Grade	Temperature (deg. C.)	14.9			
Į	Conductivity (uS/em)	140,7			
Noter	Well Purpose	Groundwater Monitoring			
	Hydrogeologist	Keith Milano			
	Сотралу	MAC CONSULTANTS, INC.			

MONITORING WELL							
CONSTRUC	CONSTRUCTION LOG						
Protective Casing (Cover)	Well No.	MW-85					
	Client	Sid Harvey, Inc.					
Concrete Pad	Project	Voluntary Cleanup Project, Number V-00145-1					
	Surveyor	Survey Date					
	Measuring Point Elevatio	n					
Clean Fill	Installation Date	October 9, 2002					
	Drilling Contractor	Delta Well & Pump					
	Drilling Method	Hollow Stem Auger					
A state of the sta	Drilling Fluid	Water					
Grout Barasso Type I Coment	Fluid Loss During Drillin	ig (gais.)					
15 Pt. Below Grade	Development Technique(	s) Submersible Pump					
Seal Type Bentonite Pellots	Date(s) of Development	October 23, 2002					
17 Ft. Below Grade 20 Ft. Below Grade	Water Removed During l	Development (gals) 20					
2 Inch Dismater Well Screen	Depth to Water (ft. below	9.39 <u>9.39</u>					
	Pumping Depth to Water	(ft. below M.P.) 9.53					
PVC Well Screen Material	Pumping Duration (total)	) 10 min					
10 Siot Size	Yield (gpm)	2.0					
Gravei Filter Pack	pН	6.8					
Grain Size	Turbidity (NTU)	3.68					
500 Feet Below Grade Feet Below Grade	Temperature (deg. C.)	16,1					
	Conductivity (uS/cm)	615					
	Well Purpose	Groundwater Monitoring					
Notes:	Hydrogeologist	Keith Milano					
	Company	MAC CONSULTANTS, INC.					

MONITORING WELL						
CONSTRU	CTION LOG					
Protective Casing (Cover)	Well No.	MW-81				
Concrete Pad	Client	Sid Harvey, Inc.				
Land Surface	Project	Voluntary Cleanup Project, Number	V-00145-1			
	Surveyor		Survey Date			
[2] [2] [2] [2] [2] [2] [2] [2] [2] [2]	Mensuring Point Elevatio	IR				
Clean Fill	Installation Date	October 9, 2002				
for a	Drilling Contractor	Delta Well & Pump				
1945 2 Inch Diameter Well Casing	Drilling Method	Hollow Stem Auger				
earling Material	Drilling Fluid	Water				
Grout Barasso Type I Cement	Fluid Loss During Drillin	ig (gais.)				
75 PL Below Grøde	Development Technique(	s) Submersible Pump				
Scal Type Bentonite Pellets	Date(s) of Development	October 23, 2002				
77 Ft. Below Grade	Water Removed During	Development (gais)	71			
	Depth to Water (ft. below	/ M.P.)	9.38			
2 Inch Diameter Well Screen	Pumping Depth to Water	(ft. below M.P.)	15.69			
PVC. Well Screen Materiai	Pumping Duration (total	) 42 min				
10 Slot Size	Yield (gpm)	1.7				
Gravel Filter Pack W.G. #1 Grain Size	pH	6.2				
90 Feet Below Grade	Turbidity (NTU)	49.6				
feet Below Grade	Temperature (deg. C.)	15.5				
	Conductivity (uS/cm)	235				
	Well Purpose	Groundwater Monitoring				
Notca:	Hydrogeologist	Keith Milano				
	Company	MAC CONSULTANTS, INC.				

	MONITORING WELL CONSTRUCTION LOG						
	Protective Casing (Cover)	Well No.	MW-8D				
		Client	Sid Harvey, Inc.				
	Concrete Pad	Project	Voluntary Cleanup Project, Number	V-00145-1			
		Surveyor		Survey Date			
32 2		Measuring Point Elevation	n				
	e Ciean Pili	Installation Date	October 8, 2002				
	6 Inch Diameter Borehole	Drilling Contractor	Delta Well & Pump				
		Drilling Method	Hollow Stem Auger				
	2 Isch Diameter Weil Casing 4 <u>PVC</u> Weil Casing Material	Drilling Fluid	Water				
	Grout <u>Barasso Type ! Cement</u>	Fluid Loss Durlag Drilling	g (gais.)				
	9 115 FL Below Grado	Development Technique(s	) Submersible Pump				
	Seal Type Bentonite Pellets	Date(s) of Development	October 23, 2002				
	117 Ft. Below Grade	Water Removed During D	evelopment (gals)	56			
	120 Ff. Below Grade	Depth to Water (ft. below	M.P.)	12.59			
	2 Inch Diameter Well Screen	Pumping Depth to Water	(ft. below M.P.)	30.02			
	PVC Well Serven Material	Pumping Duration (total)	33 min.				
	10 Slot Size	Yleid (gpm)					
	Gravel Filter Pack	рН	6.2				
	<u>W.C. #1</u> Grain Size	Turbidity (NTV)	44.1				
	130 Feet Below Grade Feet Below Grade	Tempersture (deg. C.)	15.9				
		Conductivity (uS/em)	228				
		Well Purpose	Groundwater Monitoring				
Notes:		Hydrogeologist	Keith Milano				
_		Соправу	MAC CONSULTANTS, INC.				

MONITOR	ING WELL		
CONSTRUC	TION LOG		
Protoctive Casing (Cover)	Well No.	M₩-9S	
Concrete Pad	Client	Sid Harvey, Inc.	
Lasd Surface	Project	Voluntary Cleanup Project, Number	V-00145-1
	Surveyor		Survey Date
	Messuring Polat Elevation	a	
Cican Fill Z FL Below Grade	Instaliation Date	October 1, 2002	
	Drilling Contractor	Delta Well & Pump	
2 Inch Diameter Weil Casing	Drilling Method	Hallow Stem Auger	· .
PVC Well Casing Material	Drilling Fluid	Water	
Grout Barasso Type   Coment	Fluid Loss During Drilling	g (gais.)	
FL Below Grade	Development Techniquo(s	) Submersible Pump	
Seal Type Bentonite Pollets	Date(s) of Development	October 24, 2002	
17 Ft. Below Grade	Water Removed During D	evelopment (gals)	20
	Depth to Water (ft. below	M.P.)	11.87
	Pumping Depth to Water	(ft. below M.P.)	12.01
PVC Well Screen Material	Pumping Duration (total)	10 min.	
10 Slot Stze	Yield (gpm)	2.0	
Gravel Filter Pack	pH	6.2	
	Turbidity (NTU)	0.63	
Feet Below Grade	Temperature (deg. C.)	16.9	
	Conductivity (uS/cm)	418	
	Well Purpose	Groundwater Monitoring	
Notes:	Hydrogeologist	Keith Milano	
	Company	MAC CONSULTANTS, INC.	
(%.			

			<u>MONITOR</u> CONSTRUC	ING WELL CTION LOG			
		Protective C Concrete Pa Cleas Fill 2 Ft. Below G 6 6 2	asing (Cover) d Land Surface rade luch Diameter Borehole Loch Diameter Well Caulon	Well No. Client Project Surveyor Measoring Point Elevation Installation Date Drilling Contractor Drilling Method	MW-91 Sid Harvey, Inc. Voluntary Cleanup Project, Number October 1, 2002 Delta Well & Pump Hollow Stem Auger	V-00145-1 Survey Date	
		PVC Grent	Well Casing Material Barasso Type I Cement	Driiling Fluid Fluid Loss Daring Driiling	Water		
	71	0 Ft. Belaw Gi Scal Type 2 Ft. Below Gi 5 Ft. Below Gi	rade Bentonite Pollets rade rade luch Diameter Well Screen	Development Tochnique(s) Date(s) of Development Water Romoved During De	Submersible Pump October 24, 2002 rvelopment (gals)	60	
		2		Depth to Water (ff. below M Pumping Depth to Water (f	M.P.)	11.65	
		10 Gravel	weit Screen Material Slot Size Filter Pack	Putaping Duration (retail)        30 min.           Yield (gpm)        2.0           pH        6.2	2.0 <u>6.2</u>		
		W.G. #1	<u> </u> Graide ; Graide ; Graide	Turbidity (NTU) , Temperature (deg. C.)	46.8		
			ŀ	Conductivity (uS/cm)	602 Oroundwater Manitoring		
No				Hydrogeologist Company	Keith Milano		
MONITOR CONSTRU	UNG WELL CTION LOG						
--	---						
Protective Casing (Cover) Concrete Pad Land Surface Cican FUI 2 FL Below Grade 6 Inch Diameter Borehole 2 Inch Diameter Well Casing PVC Well Casing Material	Well Ne.     MW-9D       Client     Sid Harvey, Inc.       Project     Voluntary Cleanup Project, Number V-00145-1       Sarveyor						
Grout Barasso Type I Cement	Fluid Loss During Drilling (gais.)         Development Technique(s) Submersible Pump         Date(s) of Development October 24, 2002         Water Removed During Development (gais)         55         Depth to Water (ft. below M.P.)						
PVC Well Screen Material	Pumping Depth to Water (ft. below M.P.)     74.42       Pumping Duration (total)     110 min.       Yleid (gpm)     0.5       pH     6.4       Turbidity (NTU)     48.2       r						
Notes:	Well Purpose     Groundwater Monitoring       Hydrogeologist     Keith Milano       Company     MAC CONSULTANTS, INC.						

# MONITORING WELL MW-10

# CONSTRUCTION LOG

Well Cap	Well Number MW-10
Flushmount Curb Box	NYSDEC Project Voluntary Cleanup Program V-00145-1
	Project Operable Unit 2 Remedial Action Work Plan
Land Surface	Surveyor Survey Date
	Land Surface Elevation Approx 28 ft. (NGVD 29)
6 Feet Below Grade	Measuring Point Elevation
4-1/4 Inch Diameter Borehole 2 Inch Diameter Well Casing Sch 40 PVC Well Casing Material	Northing Easting
	Installation Date March 2, 2005
▼ 8.5 - 9.5 Approximate Depth to Water (ft.)	Drilling Contractor Phil Zackman, Jr R&L Drilling Company, Inc.
Bentonite Grout	Drilling Method Hollow Stem Auger
60 Feet Below Grade	Drilling Rig Deep Rock DR-50
	Drilling Fluid Water
Bentonite Pellet (TR-30 3/8") Seal	Fluid Loss During Drilling (Est 20 gallons
64 Feet Below Grade	
68 Feet Below Grade	Development Techniques Centrifugal pumping / back-surging
2 Inch Diameter Well Screen	Date(s) of Development March 18, 2005
Sch. 40 PVC Well Screen Material	Water Removed During Development
	Depth to Water (Ft. below M.P.) 8.55
Filter Pack WG #2 Grain Size	Pumping Depth to Water (Ft. below M.P.) 9.08
78 Feet Below Grade	Pumping Duration Yield 7 gpm
80 Feet Below Grade	Specific Capacity
t+	
Notes:	Hydrogeologist Michael Bluight
	Company NAC CONSULTANTS, INC.

MONITORING W	/ELL MW-118	
CONSTRUCT	TION LOG	
Well Cap 8 Inch Flushmount Curb Box Land Surface 0.75 Feet Below Grade	Well Number     MW-11S       NYSDEC Project     Voluntary Cleanup       Project     OU-2 Remedial Act       Surveyor     N/A	Project Number V-00145-1 tion Work Plan Date N/A
Clean Fill WG #2 Grain Size 3-1/4 Inch Diameter Borehole Inch Diameter Well Casing Sch 40 PVC Well Casing Material	Land Surface Elevation N/A Measuring Point Elevation N/A Northing N/A Easting	N/A
	Installation Date June 2, 2006 Drilling Contractor Zebra Environment Drilling Method Geoprobe/Direct Pu	ן, Incsh
22 Feet Below Grade Bentonite Pellet (TR-30 3/8") Seal	Drilling Fluid <u>None</u> Fluid Loss During Drilling (Est) <u>None</u>	
27     Feet Below Grade       30     Feet Below Grade	Development Techniques	Overpumping
2 Inch Diameter Well Screen Sch 40 PVC Well Screen Material	Date(s) of Development June 7, 2 Water Removed During Development	Approximately 50 gallons
Filter Pack	Depth to Water (Ft. below M.P.)	5.73 feet BLS
<u>35</u> Feet Below Grade	Pumping Depth to water (Pt. below M.P.) Pumping Duration	Yield 1.12 gpm
	Final Purge Turbity 31.6 N.T.U.	
Notes:	Hydrogeologist Michael A. Bluight Company NAC CONSULTA	NTS, INC.

	MONITORING WELL MW-11D											
						<b>CONSTRUCT</b>	ION LOG					
	Well Cap 8 Inch Flushmo			8 Inch Flush	mount Curb Box	Well Number		MW-11D Voluntar	y Cleanup	Project Num	ber V-00145-1	
							Project		Supplem	entary Off-	Site Investig	ation
					0.75	Feet Below Grade Clean Fill Feet Below Grade	Surveyor	N/A Elevation	1	Survey I N/A	Date <u>1</u>	N/A
		Contraction of the		and the second			Measuring Po	oint Eleva	tion _	N/A		
	-		ſ	1	9.0 to 10.0	Approx. Depth to Water (ft.)	Northing	N/A		Easting .	N/A	
					3-1/4 2 Sch 40 PVC	Inch Diameter Borehole Inch Diameter Well Casing Well Casing Material	Installation D	Date	February	6, 2007		
0				Bentonite (Benseal)/Portland Type 1 Cement Grout	enseal)/Portland Type 1 Cement	Drilling Cont Drilling Meth	tractor	Aquifer [ Hollow S	Drilling and	l Testing, In	c	
				たった	148	Feet Below Grade	Drilling Fluid	d _	None			
	4				Bentonite Pe	ellet (TR-30 3/8") Seal	Fluid Loss D	uring Dril	ling (Est) _	None		
					155	Feet Below Grade Feet Below Grade	Development	t Techniqu	ies	Surging/	Overpumpin	ng
					2	_ _Inch Diameter Well Screen	Date(s) of De	evelopmen	it _	February	9, 2007	
					Sch 40 PVC	Well Screen Material	Water Remov	ved During	g Developm	ient	Approxin	nately 280 gallons
					10	Slot Size	Depth to Wat	ter (Ft. bel	ow M.P.)		9.31 feet	BLS
					WG #2	Filter Pack Grain Size	Pumping Dep	pth to Wat	er (Ft. belov	w M.P.)	9.37 feet	BLS
		Ļ			171.5	Feet Below Grade	Pumping Dur	ration	195 minu	ites	Yield _	1.43 gpm
					1/1./4	reel Below Grade	Final Purge T	Curbity	18.9 N.T.	.U.		
	Notes:	Insta	lled u	sing a l	Mobile Drill B61	Hollow Stem	Hydrogeolog	ist	Michael	A. Bluight		
0		Auge Appr	er dril ox. 2	ling rig 00 galle	. Well Installed floors of water addee	ush with grade. I during installation	Company		NAC CO	ONSULTA	NTS, INC.	

Sid Harvey Industries, Inc. Valley Stream New York

Performance Monitoring Well Logs



ENVIRONMENTAL SPECIALISTS Į

MELL: PW1 DATE DRILLED: 07/29/2003 COORD #1: COORD #2: SITE: 11, 11 E. Mineola Avenue, , Valley Stream, NY INNER CASING: PVC OUTER CASING: DIAMETER: 2* DIAMETER: LENGTH: 4' LENGTH: SET WELL: 19' GAL PER MIN: 1/2 GRAVEL PK S2: MOTIE #2 STAT H20 LVL: 8' DRILLER: Jim Burton DEVELOPMENT METHO SURFACE COMPLETION: M DEVELOPMENT TIME: DEPTH BELOW BLOWS PER 6* SURFACE ON SAMPLER FROM - TO Ground S REMARKS / SOILS IDENTIFICATION MATERIA 0'-6* Asphalt. 6*- 2' Fill material. 2' X 2' Gravel M PVC Casi 2* Diame Neat Cem (ASTM TY 0'- 2' Diame	PERMIT #1: PERMIT #2: COUNTY: XSTREET: USE: Monitor SCREEN TYPE 1: PVC DRILLING METHOD: Auger SCREEN TYPE 2: DIAMETER: 2* LENGTH 1: 15' TOTAL DEPTH: 19' LENGTH 2: SLOT SIZE: .020 D: PUmp CASING SEAL: Portland 1/2 OPEN HOLE: Murface Compression Cap
INNER CASING: PVC DIAMETER: 2" DIAMETER: LENGTH: 4' SET WELL: 19' GRAVEL PK 52: MORIE #2 STAT H20 LVL: 8' DEVELOPMENT METHO SURFACE COMPLETION: M DEVELOPMENT TIME: DEPTH BELOW BLOWS PER 6" SURFACE ON SAMPLER FROM - TO REMARKS / SOILS IDENTIFICATION REMARKS / SOILS IDENTIFICATION 0'-6" Asphalt. 6'- 2' Fill material. 2'- 19' Light brown m/c sand trace small gravel. PVC Casi 2" X 2' Gravel M PVC Casi 2" Diame	SCREEN TYPE 1: PVC DRILLING METHOD: Auger SCREEN TYPE 2: SAMPLING METHOD: DIAMETER: 2* HOLE DIA: 8*, 2* LENGTH 1: 15' TOTAL DEPTH: 19' LENGTH 2: SLOT SIZE: .020 D: PUmp CASING SEAL: Portland 1/2 OPEN HOLE:
DEPTH BELOW BLOWS PER 6" SURFACE ON SAMPLER FROM - TO Ground S AT-Grade Matertig D'-6" Asphalt. 6"- 2' Fill material. 2' 19' Light brown m/c sand trace small gravel. PVC Casi 2" Diame Neat Cam (ASTM TY 0'- 2' PVC Scre 2" Diame	Protective ht Manhole Compression Cap Concrete Pad ix Concrete concrete
AT-Grade Matertig D'-6" Asphalt. 5"- 2' Fill material. 2'- 19' Light brown m/c sand trace small gravel. PVC Casi 2" Diame Neat Cam (ASTM Ty 0'- 2' PVC Scre 2" Diame	Protective ht Manhole Compression Cap Concrete Pad ix Concrete ref
CEMARKS / SOILS IDENTIFICATION     Locking       D'-6" Asphalt.     Locking       D'-7 2' Fill material.     2' x 2'       Gravel.     Gravel M       PVC Casi     2" Diame       Neat Cem     (ASTM Ty)       0'- 2'     "	Compression Cap
D'-6" Asphalt. 6"- 2' Fill material. 2'- 19' Light brown m/c sand trace small gravel. <u>PVC Casi</u> 2" Diame <u>VC Scre</u> 2" Diame	Concrete Pad
Neat Cam (ASTM Ty 0'- 2'	
 PVC Scre 2* Diame	ent Grout pe 11, 5% Bentonite Added)
PVC Scre 2ª Diame	
2ª Diame	en
Gravel P	ter 4'- 19' Screen
2'- 19'	ack
c. <u>Bore Hol</u> 8", 2" D	ack
Battom C	ack have a set of the set o

		PERI	FORMANCE MONIT	ORING WELL	<u>PMW-2</u>
ſ		Well Cap		Well Number	PMW-2
	ľ	Flushmour	nt Curb Box	NYSDEC Project	Voluntary Cleanup Program V-00145-1
				Project	Operable Unit 2 Remedial Action Work Plan
			Land Surface	Surveyor	Survey Date
			_Native Material	Land Surface Elevati	ion
		2	2 Inch Diameter Well Casing Steel Well Casing Material	Measuring Point Elevation	
		Steel		Northing	Easting
				Installation Date	July 27, 2006
			f Fast Dalam Cards	Drilling Contractor	J. Pedersen - Delta Well and Pump Co., Inc.
		2 Joch Diamater Well Server	Drilling Method	Drirect Push (Cable Tool/Tripod Assembly)	
				Drilling Fluid	Water
		2	2 Inch Diameter Well Screen Lless Steel Well Screen Material 10 Slot Size 0.5 Approximate Depth to Water (ft.)	Fluid Loss During D	rilling (Est
		Stainless Steel Well Screen Material <u>10</u> Slot Size 8.5 - 10.5 Approximate Depth to Water (ft.)		Development Techni	iques Overpumping
<b>_</b>				Date(s) of Developm	July 27, 2005
				Water Removed Dur	ring Development 20 gallons
			Depth to Water (Ft. b	below M.P.) 9.91	
			Pumping Depth to W	Vater (Ft. below M.P.) 9.92	
		15	Feet Below Grade	Pumping Duration	13 minutes Yield 1.54 gpm
	$\checkmark$			Final Turbidity	17.2 N.T.U.
Notes:				Hydrogeologist	Michael A. Bluight
				Company	NAC CONSULTANTS, INC.
				L	

	PERFORMANCE MONITORING WELL PMW-3						
			<u>CONSTRUCT</u>	TION LOG			
	Well	Сар		Well Number	PMW-3		
	Further Flushmount Curb Box				Voluntary Cleanup Program V-00145-1		
		_	<u> </u>	Project	Operable Unit 2 Remedial Action Work Plan		
			Land Surface	Surveyor	Survey Date		
			Native Material	Land Surface Elevati	on		
				Measuring Point Elev	vation		
		2	Inch Diameter Well Casing	Northing	Easting		
		Steel	_ well Casing Material	Installation Date	July 19, 2005		
	8.5	- 10.5 Appro	ximate Depth to Water (ft.)	Drilling Contractor	J. Pedersen - Delta Well and Pump Co., Inc.		
				Drilling Method	Drirect Push (Cable Tool/Tripod Assembly)		
				Drilling Fluid	Water		
				Fluid Loss During D	rilling (Est7 gallons		
=		30	Feet Below Grade	Development Techni	ques Surging/Overpumping		
		2	Inch Diameter Well Screen	Date(s) of Developm	entJuly 26, 2005		
	Sta	inless Steel	Well Screen Material	Water Removed Dur	ing Development Approximately 150 gallons		
		10	_Slot Size	Depth to Water (Ft. b	pelow M.P.) 9.97		
				Pumping Depth to W	/ater (Ft. below M.P.)		
		35	Feet Below Grade	Pumping Duration	40 minutes Yield 3.75 gpm		
				Final Tubidity	37.8 N.T.U		
Notes:				Hydrogeologist	Michael A. Bluight		
				Company	NAC CONSULTANTS, INC.		

PERFORMANCE MONI	TORING WELL PMW-4
	Well Number PMW-4
Well Cap	NYSDEC Project Voluntary Cleanup Program V-00145-1
	Project Operable Unit 2 Remedial Action Work Plan
Land Surface	Surveyor Survey Date
Native Material	Land Surface Elevation
	Measuring Point Elevation
- 2 Inch Diameter Well Casing Sch. 40 PVC Well Casing Material	Northing Easting
■ 8.5 - 10.5 Approximate Depth to Water (ft.)	Drilling Contractor J. Pedersen - Delta Well and Pump Co., Inc.
	Drilling Method Drirect Push (Cable Tool/Tripod Assembly)
	Drilling Fluid
	Fluid Loss During Drilling (Est. 7 gallons
45.5 Feet Below Grade	Development Techniques Surging/Overpumping
2 Inch Diameter Well Screen	Date(s) of Development July 27, 2005
Stainless Steel Well Screen Material	Water Removed During Development Approximately 210 gallons
	Depth to Water (Ft. below M.P.) 9.88
	Pumping Depth to Water (Ft. below M.P.) 9.91
50.5 Feet Below Grade	Pumping Duration <u>65 minutes</u> Yield <u>3.23 gpm</u>
	Final Tubidity 44.3 N.T.U
Notes:	Hydrogeologist Michael A. Bluight
	CompanyNAC CONSULTANTS, INC

# Sid Harvey Industries, Inc. Valley Stream New York

Soil Vapor Extraction Well Logs

	MONITORING	<u>WELL</u>	
	CONSTRUCTIO	<u>ON LOG</u>	
		Well No.	SVE-1
		Client	Sid Harvey Industries, Inc.
Wei	Сар	Project	Supplemental Site Investigation and Pilot Test
	Land Surface	Surveyor	Survey Date
		Land Surface Elevat	lon
	4 Inch Diameter Borehole	Measuring Point Ele	vstion
		Northing	
	Inch Diameter Well Casing	Easting	
	<u>PVC</u> Well Casing Material	Installation Date	05-15-01
	Grout Bentonite Chips	Drilling Contractor	TriState Drilling , LLC
		Drilling Method	Hollow Stem Auger
	O Pt. Below Grade	Drilling Fluid	
	Seal Type Bentonite Chips	Fluid Loss During D	rliling (gais.)
	1 Ft. Below Grade 3 Ft. Below Grade	Development Techni	que(1)
	2 Inch Diameter Well Screen	Date(s) of Developme	ent
	Well Sereen Material	Water Removed Dur	ing Development (gals)
	Slot Size	Depth to Water (ft. b	elow M.P.)
	<u>Gravel</u> Filter Pack Grain Size <u>WG #2</u>	Pumping Depth to W	ater (fL below M.P.)
	8 Feet Below Grade	Pumping Duration	
		Yield (gpm)	
		Specific Capacity	
		weil Purpose	Soli vapor Extraction
Notes:		Hydrogeologist	
		Company	MAC CONSULTANTS, INC.

MONITORING	MONITORING WELL						
CONSTRUCTIO	<u>ON LOG</u>						
	Well No. SVE-2						
Well Cap	Client         Sid Harvey Industries, Inc.           Project         Supplemental Site Investigation and Pilot Test						
	Surveyor Survey Date						
6 Inch Dismeter Borebole	Messuring Point Elevation						
1 Avenue of the second se	Northing						
PVC Well Casing Material     Grout Bentonite Chips	Installation Date 05-16-01						
	Drilling Contractor TriState Drilling , LLC Drilling Method Hollow Stem Auger						
FL Below Grade Seal Type	Drilliog Fluid						
<u>1</u> FL Below Grade <u>3</u> FL Below Grade	Fluid Loss During Drilling (gals.) Development Technique(s)						
2 Inch Dismeter Well Screen	Date(s) of Development						
	Water Removed During Development (gsls)						
Gravel Filter Pack Grain Stze WO #2	Pumping Depth to Water (ft. below M.P.)						
8 Feet Below Grade	Yield (gpm)						
	Speelfie Capacity           Well Purpose         Soil Vapor Extraction						
Notes:	Hydrogeologist <u>Keith Milano</u>						
	Company MAC CONSULTANTS, INC.						



ENVIRONMENTAL SPECIALISTS

-		WEL	L LOG	
WELL: SVE3 DATE DRIE	LED: 07/30/2003	COORD #1: COORD #2:	PERMIT #1: PERMIT #2:	COUNTY :
SITE: 11, 11 E. Mineola Avenue, OWNER: 11, 11 E. Mineola Avenue,	, Valley Stream, , Valley Stream,	NY NY		XSTREET: USE: Monitor
INNER CASING: PVC	OUTER CASING:		SCREEN TYPE 1: PVC	DRILLING METHOD: Auger
DIAMETER: 2"	DIAMETER:		SCREEN TYPE 2: DIAMETER: 2"	SAMPLING METHOD:
			LENGTH 1: 5'	TOTAL DEPTH: 11'
SET WELL: 11'	GAL PER MIN: 1/	2	LENGTH 2:	
GRAVEL PK SZ: Morie #2 DBILLER: Jim Burton	STAT H2O LVL: 8'	ENT METHOD . Plan	SLOT SIZE: .020 CASING SEAL	Portland
SURFACE COMPLETION: M	DEVELOP	LENT TIME: 1/2	OPEN HOLE:	FOILIBIN
DEPTH BELOW BLOWS PER 6	; <b>n</b>			
SURFACE ON SAMPLER				
		Ground Surface		
-		AT-Grade Protec	tive	
REMARKS / SOILS IDENTIFICATION		Watertight Manh	ole	
		Locking Compres	sion Cap	
0'-1' Concrece. 1'- 6' Fill material.				
6'- 11' Light brown m/c sand.				
		2' x 2' Concret Gravel Mix Conc	e Pad Constant Consta	
		orandi min come	20000000000	
		2" Diameter		
		2 Didnetti		
		Nest Cement Gro		0'- 6' Solid
		(ASTM Type II,	5% Bentonite Added)	
		0'- 4'		
5				
		PVC Screen		
		2* Diameter		
				61- 111 Saraan
		Gravel Pack		
		4'- 11'		
5.		Bore Hole		
		o", ∡" Diameter		
		<b>0</b>		
		Bottom Cap		
				400-000-000-000-000-000-000-000-000-000

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ENVIRONMENTAL SPECIALISTS

		WELL LOG		
WELL: SVE4 DATE DRIL SITE: 11, 11 E. Mineola Avenue, OWNER: 11, 11 E. Mineola Avenue,	LED: 07/29/2003 COORD COORD , Valley Stream, NY , Valley Stream, NY	#1: PERM #2: PERM	 IT #1: IT #2:	COUNTY: XSTREET: USE: Monitor
INNER CASING: PVC DIAMETER: 2" Length: 6' Set Well: 11' JRAVEL PK SZ: Morie #2	OUTER CASING: DIAMETER: LENGTH: GAL PER MIN: 1/2 STAT H2O LVL: 8'	SCREEN TYPE SCREEN TYPE DIAMETER: LENGTH 1: LENGTH 2: SLOT SIZE:	1: PVC 2: 2* 5'	DRILLING METHOD: Auger SAMPLING METHOD: HOLE DIA: 8*, 2* TOTAL DEPTH: 11'
DRILLER: Jim Burton SURFACE COMPLETION: M	DEVELOPMENT M DEVELOPMENT T	THOD: PUmp	CASING SEAL: Port ] OPEN HOLE:	and
DEPTH BELOW BLOWS PER 6 SURFACE ON SAMPLER			1977 B	
PROM - 10	Grou	d Surface		
-	AT-G	rade Protective		
EMARKS / SOILS IDENTIFICATION	Wate	tight Manhole		
D'-6" Asphalt.	Lock:	ng Compression Cap		
6"- 2' Fill material.				
gravel.	2' x	2' Concrete Pad		
	Grave	Mix Concrete		
	PVC /	Tagino		
	2* D:	ameter		—
				Alla 61 Solid
	Neat (AST	Cement Grout 4 Type II, 5% Bentonite	Added)	o o sond
	0'-	,		
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
ĩ			in the	
	PVC :	ameter		
				B'- II' Screen
	Grave	Pack		
	4'- 1	1.		
	Bore	Hole		
C*-	8", 3	" Diameter		
	_			
	Botto	m Cap	ī	



ENVIRONMENTAL SPECIALISTS

	WELL LOG		
WELL: SVE5 DATE DRILLED: 07/29/200 SITE: 11, 11 E. Mineola Avenue, , Valley Strea OWNER: 11, 11 E. Mineola Avenue, , Valley Strea	COORD #1: COORD #2: m, NY m, NY	PERMIT #1: PERMIT #2:	COUNTY: XSTREST: USE: Monitor
INNER CASING: PVC OUTER CASING: DIAMETER: 2" DIAMETER: LENGTH: 6' LENGTH: SET WELL: 11' GAL PER MIN: GRAVEL PK SZ: MORIE #2 STAT H20 LVL: DRILLER: Jim Burton DEVELO SURFACE COMPLETION: M DEVELO	SCREEN SCREEN DIAMETE LENGTH 1/2 LENGTH 8' SLOT SI PPMENT METHOD: PUmp PPMENT TIME: 1/2	TYPE 1: PVC TYPE 2: R: 2" 1: 5' 2: ZE: .020 CASING SEAL: Port OPEN HOLE:	DRILLING METHOD: Auger SAMPLING METHOD: HOLE DIA: 8", 2" TOTAL DEPTH: 11'
DEPTH BELOW BLOWS PER 6" SURFACE ON SAMPLER FROM - TO	Ground Surface		
	AT-Grade Protective		
REMARKS / SOILS IDENTIFICATION	Watertight Manhole Locking Compression Cap		
0'-6" Asphalt. 6"- 2' Fill material. 2'- 11' Light brown m/c sand trace small gravel.	2' x 2' Concrete Pad Gravel Mix Concrete		
	PVC Casing 2" Diameter		
	Neat Cement Grout (ASTM Type II, 5% Bento D'- 4'	nite Added)	0'- 6' Solid
c		-	
	PVC Screen 2ª Diameter		5'- 11' Screen
	Gravel Pack		
. с.	BOTE HOLE 8", 2" Diameter Bottom Cap		

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ENVIRONMENTAL SPECIALISTS



Sid Harvey Industries, Inc. Valley Stream New York

Air Sparge Well and Air Sparge Well Cluster Logs

NAC CONSULTANTS, INC.



NESTED AIR SPARGE WELL CL	<u>USTEK AS-2</u>
<u>CONSTRUCTION LOC</u>	<u> </u>
Weli Cap	Well NumberAS-2A (shallow) & AS-2B (deep)
Flushmount Curb Box	NYSDEC Project Voluntary Cleanup Program V-00145-1
Land Surface	Project Operable Unit 2 Remedial Action Work Plan
Clean Fill	Surveyor Survey Date
3 Feet Below Grade	Land Surface Elevation
. <u>10</u> Approximate Depth to Water (ft.)	Measuring Point Elevation
1 Inch Diameter Well Casing	Northing Eastiny
PVC Well Casing Material Bentonite Grout	Installation Date March 7, 2005
	Drilling Contractor Phil Zackman, Jr R&L Well Drilling, LLC
43 Feet Below Grade	Drilling Method Hollow Stem Auger
I Inch Diameter Well Screen	Drilling Rig Deep Rock DR-50
10 Sto Size PVC Weil Casing Material	Drilling Fluid Water
43 Feet Below Grade 48 Feet Below Grade	Fluid Loss During Drilling (Est_ 5 to 10 gailons
	Development Techniquesn/a
	Date(s) of Development
4-1/4 Inch Diameter BoreholeBentonite Grout	Water Removed During Development
	Depth to Water (Ft. below M.P.)a/a
65 Feet Below Grade	Pumping Depth to Water (Ft. below M.P.) <u>n/a</u>
1 Inch Diametor Well Screen PVC Well Screen Material	Pumping Duration
Filter Pack	Yield <u>n/a</u> gpm
WG # 1 Grain Size 70 Feet Below Grade	Specific Capacity
reet Below Grade	Engineer Michael Milovich
Notes:         Cuttings not present until 25 feet BLS. Possible void below grade. Rebar and wood           found 1 to 3 feet BLS.	Company NAC Consultants, Inc.

# NESTED AID SPADCE WELL CLUSTER AS.2

#### AIR SPARGE WELL CONSTRUCTION LOG Well Number(s) AS-3 ····· Well Cap NYSDEC Project Voluntary Cleanup Program V-00145-1 --- Flushmount Curb Box Operable Unit 2 Remedial Action Work Plan Project ---- Land Surface Survey Date Surveyor Clean Fill Land Surface Elevation 3 Feet Below (Angled) Grade Measuring Point Elevation 4-1/4 Inch Diameter Borehole 2 Inch Diameter Well Casing Easting Northing Steel Well Casing Material Installation Date August 4-5, 2005 ▼ 9.47 Depth to Water (ft., measured 8/5/05) Drilling Contractor J. Pedersen - Delta Well and Pump Co., Inc. Drilling Method Hollow Stem Auger - Angular Drilling Technique Bentonite Grout (Vorclay) Drilling Fluid Water Fluid Loss During Drilling (Est 15 gallons 78 Feet Below (Angled) Grade 80 Feet Below (Angled) Grade Development Techniques n∕a 2 Inch Diameter Well Screen Date(s) of Development n/a St. Steel Well Screen Material n/a Water Removed During Development 10 Slot Size Depth to Water (Ft. below M.P.) n/a Filter Pack (Filpro) WG #1 Grain Size Pumping Depth to Water (Ft. below M.P.) n/a 83 Feet Below (Angled) Grade Pumping Duration n/a Yield n/a gpm Specific Capacity n/a Notes: This well was installed at a 25° angle towards the northeast corner of the Cleaning Department. Hydrogeologist Michael Bluight Approximate Vertical Depth: 72.50 feet

-

Company

NAC CONSULTANTS, INC.

Approximate Horizontal Run: 33.81 feet



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-11520

	NESTED AIR SPARGE WELL CL	USTER AS-7
	CONSTRUCTION LOC	<u>S</u>
	Well Cap	Well Number     AS-7A (shallow) & AS-7B (deep)       NYSDEC Project     Voluntary Cleanup Program V-00145-1       Project     Operable Unit 2 Remedial Action Work Plan
	Clean Fill Fet Below Grade	Survey Date Survey Date
	Inch Diameter Well Casing	Measuring Point Elevation           Northing
	PVC Well Casing Material Bentonite Grout	Installation Date <u>March 14, 2005</u> Drilling Contractor <u>Phil Zackman, Jr R&amp;L</u> Well Drilling, LLC
	43 Feet Below Grade	Drilling Method Hollow Stem Auger
	PVC     Well Screen Material       10     Slot Size       45     Feet Below Grade         48     Feet Below Grade	Drilling Fluid Water Fluid Loss During Drilling (Est 5 to 10 gallons
	4-1/4 Inch Diameter Borehole Bentonite Grout	Development Techniques n/a
	65 Feet Below Grade	Water Removed During Development <u>n/a</u> Depth to Water (Ft. below M.P.) <u>n/a</u> Pumping Depth to Water (Ft. below M.P.) <u>n/a</u>
	Filter Pack	Pumping Duration <u>n/a</u> Yield <u>n/a</u> gpm Specific Capacity <u>n/a</u>
	Notes:         Soil was not screened dur to damaged bailer	Engineer Michael Milovich Company NAC Consultants, Inc.



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# AIR SPARGE WELL CONSTRUCTION LOG

Well Cap	Well Number(s) AS-9
Flushmount Curb Box	NYSDEC Project Voluntary Cleanup Program V-00145-1
	Project Operable Unit 2 Remedial Action Work Plan
Land Surface	Surveyor Survey Date
Clean Fill	Land Surface Elevation
Feet Below (Angled) Grade	Measuring Point Elevation
4-1/4 Inch Diameter Borehole 2 Inch Diameter Well Casing	Northing Easting
Steel Well Casing Material	Installation Date August 8-9, 2005
9.44 Depth to Water (fl., measured 8/9/05)	Drilling Contractor J. Pedersen - Delta Well and Pump Co., Inc.
	Drilling Method Hollow Stem Auger - Angular Drilling
Bentonite Grout (Vorclay)	Drilling Rig Failing F-10
	Drilling Fluid Water
67 Feet Balow (Analad) Grada	Fluid Loss During Drilling (Est_ 15 gallons
69 Feet Below (Angled) Grade	Development Techniques n/a
2 Inch Diameter Well Screen	Date(s) of Development n/a
St. Steel Well Screen Material	Water Removed During Developmentn/a
Slot Size	Depth to Water (Ft. below M.P.) n/a
Filter Pack (Filpro) WG #1 Grain Size	Pumping Depth to Water (Ft. below M.P.)n/a
Feet Below (Angled) Grade	Pumping Duration n/a Yield n/a gpm
	Specific Capacityn/a
Notes: This well was installed at a 25° angle towards the	
northwest corner of the Cleaning Department.	Hydrogeologist Michael Bluight
Approximate Vertical Depth: 65.25 feet Approximate Horizontal Run: 30.43 feet	Company NAC CONSULTANTS, INC.

CONSTRUCTION LOG         Well Cap         Well Cap         Plathnouse Carb Box         A 5:10A (deallow) & A 5:10B (derg)         NYSDEC Project         Operable Unit 2 Remedial Action Work Plat         Diameter Weil Casing         PVC         PVC Weil Casing Material         A 5:10A (deallow) & A 5:10B (derg)         NYSDEC Project         Operable Unit 2 Remedial Action Work Plat         Survey Date	<u>NESTED AIR SPARGE WELL CLU</u>	USTER AS-10
Well Cap	CONSTRUCTION LOC	3
	Well Cap	Weil Number AS-10A (shallow) & AS-10B (deep) NYSDEC Project Voluntary Cleanup Program V-00145-1
10       Slot Size	Land Surface     Land Surface     Clean Fill     Gran     Gran	Project       Operable Unit 2 Remedial Action Work Plan         Surveyor
4-1/4 [nch Diameter Borehole	10         Slot Size         PVC         Well Casing Material           45         Feet Below Grade         48         Feet Below Grade	Drilling Fluid Water Fluid Loss During Drilling (Est 5 to 10 gallons
65     Feet Below Grade       68     Feet Below Grade       1     Inch Diameter Well Screen       PVC     Well Screen Material       10     Slot Size       Yield     n/a	4-1/4 (nch Diameter Borehole Bentonite Grout	Development Techniques <u>n/a</u> Date(s) of Development <u>n/a</u> Water Removed During Development <u>n/a</u>
1 10000000 ➡ 1000 To Feet Below Grade Specific Capacity n/a	65     Feet Bolow Grade       68     Feet Bolow Grade       1     Inch Diameter Well Screen       PVC     Well Screen Material       10     Slot Size	Depth to Water (Ft. below M.P.) <u>n/a</u> Pumping Depth to Water (Ft. below M.P.) <u>n/a</u> Pumping Duration <u>n/a</u> Yield <u>n/a</u> gpm
72     Feet Below Grade       Notes:	70     Feet Below Grade       72     Feet Below Grade	Specific Capacity n/a Engineer Michael Milovich Company NAC Consultants, Inc.



**Equipment Manuals** 



# **OILLESS SCROLL COMPRESSORS**

Model SES



When your pure air system demands reliability... demand Powerex's oilless compressors.

# **ENGINEERING SPECIFICATIONS**

Scroll Enclosure Simplex - Model SES (Starter and Aftercooler Included)

MODEL	HP	PHASE	SCFM @145 PSIG	SCFM @100 PSIG	VOLTAGE	FLA/ Motor	GALLON	DIMENSION LxWxH	SHP. WT (Lbs.)
SES0308	3	3	7.5	8.8	208/230/460	8.7/8/4	10	24 x 19 x 33	256
SES1308	3	1	7.5	8.8	230	17	10	24 x 19 x 33	269
SES0508	5	3	12	15.2	208/230/460	13.7/13.2/6.6	10	24 x 19 x 33	365
SES1518	5	1	12	15.2	230	25	10	24 x 19 x 33	384

# Scroll Basemount Simplex - Model SBS (Aftercooler Included)

MODEL	HP	PHASE	SCFM @145 PSIG	SCFM @100 PSIG	VOLTAGE	FLA/ Motor	GALLON	DIMENSION LXWXH	SHP. WT (Lbs.)
SB50307	3	3	7.5	8.8	208/230/460	8.7/8/4	Basemount	28 x 16 x 16	120
SBS1307	3	1	7.5	8.8	230	16	Basemount	28 x 16 x 16	135
SBS0507	5	3.	12	15.2	208/230/460	13.7 / 13.2 / 6.6	Basemount	28 x 16 x 16	140
SBS1517	5	1	12	15.2	230	25	Basemount	28 x 16 x 16	150

# Scroll Tankmount Simplex - Model STS (Aftercooler Included)

MODEL	HP	PHASE	SCFM @145 PSIG	SCFM © 100 PSIG	VOLTAGE	FLA/ Motor	GALLON JANK	DIMENSION LXWXH	SHP. WT (Lbs.)
STS030	3	3	7.5	8.8	208/230/460	8.7/8/4	30/60	39x22x35 / 51x23x39	240 / 350
STS130	3	1	7.5	8.8	230	16	30 / 60	39x22x35 / 51x23x39	255 / 365
STSOSO	5	3	12	15.2	208/230/460	13.7 / 13.2 / 6.6	30 / 60	39x22x35 / 51x23x39	260 / 370
STS151	5	1	12	15.2	230	25	30/60	39x22x35 / 51x23x39	276 / 386

# Scroll Tankmount Duplex - Model STD (Aftercoolers Included)

MODEL	HP	PHASE	SCFM @145 PSIG	SCFM @100 PSIG	VOLTAGE	FLA/ Motor	GALLON TANK	DIMENSION LxWxH	SHP. WT (Lbs.)
STD030	3 (2)	3	15	17.6	208/230/460	8.7/8/4	80	64 x 26 x 40	570
STD130	3 (2)	1	15	17.6	230	16	80	64 x 26 x 40	500
STD050	5 (2)	3	24	30.4	208/230/460	13.7 / 13.2 / 6.6	80 / 120	64x26x40 / 71x31x75	610/615
STD151	5(2)	1	24	30.4	230	25	80 / 120	64x26x40/71x31x75	642/726

# **DIMENSIONAL DRAWINGS\***

MODEL SES\_\_\_\_\_

MODEL SBS\_\_\_\_\_ MO

MODEL STS\_\_\_\_\_

MODEL STD\_

OPTIONAL EQUIPMENT

or Desiccant Drvers



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SPECIAL ENGINEERED PRODUCTS\_\_\_\_\_



\*Drawings for reference only.



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tic Starter



# Scroll Tankmount/Basemount Air Compressors

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.

# Descriptions

#### GENERAL

The Powerex Oilless Rotary Scroll Air Compressor has advanced scroll compressor technology through the development of a completely oilless unit. The Powerex Scroll Compressor offers a dynamically balanced air end which insures vibration-free operation. The rotary design permits a continuous 100% duty cycle. No oil separation, oil filtration, or inlet valves are required on the Powerex Scroll unit.

## **COMPRESSION CYCLE**

The Powerex oilless rotary scroll air compressor is based on the theory of scroll compression. A scroll is a free standing, intricate spiral bounded on one side by a solid, flat plane or base. A scroll set, the basic compression element of a scroll compressor, is made up of two identical spirals which form right and left hand parts. One of these scroll components is indexed or phased 180° with respect to the other so the scrolls can mesh. Crescent-shaped gas pockets are formed and bounded by the spirals and the base plate of both scrolls. As the moving scroll is orbited around the fixed scroll, the pockets formed by the meshed scrolis follow the spiral toward the center and diminish in size. The moving scroll is prevented from rotating during this process so the 180° phase relationship of the scrolls is maintained. The compressor's inlet is at the outer boundary of the scrolls. The compressed gas is discharged through the outlet at the center of the fixed scroll so no valves are needed.

#### TIP SEAL

The tip seal on the scroll compressor is self-lubricated and allows the unit to operate efficiently without oil and expensive filtration. The tip seal should be replaced every 10,000 hours of operation.

#### BEARINGS

The bearings on the scroll compressor are regreaseable to allow extended compressor life. Service should be performed every 10,000 hours of operation.

#### DRY TYPE INLET FILTER (P/N IP032901AV)

Order P/N·IP032901AV for both the 3 HP and 5HP units. Change every 2,500 hours or more often in dirty locations.

#### HOURMETER

The hourmeter on the scroll compressor indicates the actual number of hours the unit has been in operation. The hourmeter is also used to determine maintenance and service timing. **An hourmeter must be installed** with every Scroll compressor.

#### CONDENSATE DRAIN VALVE

A condensate drain valve must be installed on any tank used to allow removal of the liquid which will collect during compressor operation.



Drain liquid from tank daily.

# ADANGER

# Breathable Air Warning

This compressor/pump is NOT equipped and should NOT be used "as is" to supply breathing quality air. For any application of air for human consumption, you must fit the air compressor/pump with suitable in-line safety and alarm equipment. This additional equipment is necessary to properly filter and purify the air to meet minimal specifications for Grade D breathing as described in Compressed **Gas Association Commodity** Specification G 7.1 - 1966, OSHA 29 CFR 1910. 134, and/or Canadian Standards Associations (CSA).

DISCLAIMER OF WARRANTIES IN THE EVENT THE COMPRESSOR IS USED FOR THE PURPOSE OF BREATHING AIR APPLICATION AND PROPER IN-LINE SAFETY AND ALARM EQUIPMENT IS NOT SIMULTANEOUSLY USED, EXIST-ING WARRANTIES ARE VOIDED, AND POWEREX DISCLAIMS ANY LIABILITY WHATSOEVER FOR ANY LOSS, PERSONAL INJURY OR DAMAGE.

# Installation

#### RECEIVING THE UNIT

Immediately upon receipt of the scroll compressor, the unit should be inspected for any damage which may have occurred in shipment.

The compressor nameplate should be checked to see if the unit is the correct model and voltage as ordered.

#### APPLICATION

When the scroll compressor is to be used in applications other than the compressing of atmospheric air, please contact a Powerex representative for engineering and warranty information at 1-888-769-7979.

### INSTALLATION SITE

- The scroll compressor must be located in a clean, well lit and well ventilated area.
- The area should be free of excessive dust, toxic or flammable gases and moisture.
- Never install the compressor where the ambient temperature is higher than 104° F or where humidity is high.
- 4. Clearance must allow for safe, effective inspection and maintenance.

# Minimum ClearancesAbove24"Drive belt side12"Other sides20"

5. If necessary, use metal shims or leveling pads to level the compressor. Never use wood to shim the compressor.

#### VENTILATION

- If the scroll compressor is located in a totally enclosed room, an exhaust fan with access to outside air must be installed.
- 2. Never restrict the cooling fan exhaust air.
- Never locate the compressor where hot exhaust air from other heat generating units may be pulled into the unit.

#### WIRING

Refer to the general product manual. All electrical hook-ups must be performed by a qualified electrician. Installations must be in accordance with local and national electrical codes. Use solderless terminals to connect the electric power source.

#### PIPING

Refer to the general product manual.

- Make sure the piping is lined up without being strained or twisted when assembling the piping for the scroll compressor.
- Appropriate expansion loops or bends should be installed at the compressor to avoid stresses caused by changes in hot and cold conditions.
- 3. Piping supports should be anchored separately from the compressor to reduce noise and vibration.
- 4. Never use any piping smaller than the compressor connection.
- 5. Use flexible hose to connect the outlet of the compressor to the piping so that the vibration of the compressor does not transfer to the piping.

#### SAFETY VALVES

Tank mounted compressors are shipped from the factory with safety valves installed in the tank manifold. The flow capacity of the safety valve is equal to or greater than the capacity of the compressor.

- The pressure setting of the safety valve must be no higher than the maximum working pressure of the tank.
- Safety valves should be placed ahead of any possible blockage point in the system, i.e. shutoff valve.
- 3. Avoid connecting the safety valve with any tubing or piping.
- 4. Manually operate the safety valve every six months to avoid sticking or freezing.

# Operation

#### **BEFORE START UP**

- 1. Make sure all safety warnings, labels and instructions have been read and understood before continuing.
- 2. Remove any shipping materials, brackets, etc.
- Confirm that the electric power source and ground have been firmly connected.
- 4. Be sure all pressure connections are tight.
- 5. Check to be certain all safety relief valves, etc., are correctly installed.
- 6. Check that all fuses, circuit breakers, etc., are the proper size.
- 7. Make sure the inlet filter is properly installed.
- 8. Confirm that the drain valve is closed.
- Visually check the rotation of the compressor pump. If the rotation is incorrect, have a qualified electrician correct the motor wiring.

#### **START-UP AND OPERATION**

- Follow all the procedures under "Before start-up" before attempting operation of the compressor.
- 2. Switch the electric source breaker on.
- 3. Open the tank discharge valve completely.
- Check that the compressor operates without excessive vibration, unusual noises or leaks.
- 5. Close the discharge valve completely.
- 6. If the pressure does not rise on a three phase unit, turn the unit off. Have a qualified electrician switch the breaker OFF and exchange the R and T connections (two out of three phases of electric source) inside the magnetic switch.
- Check the discharge pressure. Also make sure the air pressure rises to the designated pressure setting by checking the discharge pressure gauge.
- Check the operation of the pressure switch by opening the stop valve and confirming the compressor starts as pressure drops.





#### Figure 1 - SBS Scroll Basemount Simplex







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# **Specifications**

# **Scroll Basemount Simplex - Model SBS**

Model	НР	Phase	SCFM @100 PSIG	Voltage	Full Load Amperage	Gallon Tank	Dimension LxWxH	Ship Weight (Lbs.)
SBS0307	3	3	8.6	208/230/460	8.7/8.0/4.0	Basemount	29x19x19	160
SBS1307	3	1	8.6	230	17	Basemount	29x19x19	175
SBS0507	5	3	14.7	208/230/460	13.7/13.2/6.6	Basemount	29x19x19	180
SBS1517	5	1	14.7	230	25	Basemount	29x19x19	190

# Scroll Tankmount Simplex - Model STS

Model	HP	Phase	SCFM @100 PSIG	Voltage	Full Load Amperage	Gallon Tank	Dimension LxWxH	Ship Weight (Lbs.)
STS030	3	3	8.6	208/230/460	8.7/8.0/4.0	30/60	39x22x35 / 51x23x39	280/390
STS130	3	1	8.6	230	17	30 / 60	39x22x35 / 51x23x39	295 / 405
STS050	5	3	14.7	208/230/460	13.7/13.2/6.6	30/60	39x22x35 / 51x23x39	300/410
STS151	5	1	14.7	230	25	30 / 60	39x22x35 / 51x23x39	310/420

# Scroll Tankmount Duplex - Model STD

Model	НР	Phase	SCFM @100 PSIG	Voltage	Full Load Amperage	Gallon Tank	Dimension LxWxH	Ship Weight (Lbs.)
STD030	3 (2)	З	17.2	208/230/460	17.4/16.0/8.0	80	64x26x40	650
STD130	3 (2)	1	17.2	230	34	80	64x26x40	680
STD050	5 (2)	3	29.4	208/230/460	27.4/26.4/13.2	80 / 120	64x26x40/71x35x75	690/715
STD151	5 (2)	1	29.4	230	50	80 / 120	64x26x40/71x35x75	710/735

#### MODEL SBS



MODEL STS

MODEL STD

#### **OPTIONAL EQUIPMENT**













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Item	Action needed	500	2500	Operating 5000	g Hours 10,000	15,000	20,000	Remarks
Tank	Drain moisture	Daily						
Inlet air filter	Replace	•		(Every 2,500 hrs or less)			Part #IP032901AV	
Blower fan	Clean			•	•	•	•	
Fan Duct	Clean			٠	•	•	٠	
Compressor Fins	Clean		•	(Every 2,500 hrs or less)				
Bearings	Grease						<b></b>	Service Center Only
Tip seal	Replace							
Dust seal	Replace				<b></b>		<b></b>	
V-belt	Inspect, replace	*Note 3	•		<b></b>			
Pressure Switch	Confirm operation				•		•	
Magnetic starter	Inspect				•		•	Replace if contact
Safety valve	Confirm operation		•	(Every 2,500 hrs or less)				
Pressure gauge	Inspect •			(Every 2,500 hrs or less)				
•	Inspect						_	
	Replace					•		

## **Maintenance Schedule**

NOTES:

1. Inspect and perform maintenance periodically according to maintenance schedule.

- 2. The maintenance schedule relates to the normal operating conditions. If the circumstances and load condition are adverse, shorten the cycle time and do maintenance accordingly.
- 3. \* The tension of the V-belt should be adjusted during the initial stage and inspected every 2,500 hours afterwards. Proper belt tension for 3 HP units is 7 lbs./.16" deflection; for 5 HP units, 7 lbs./.19" deflection.

4. See Compressor Pump Manuals for replacement or service procedures.
# **Electrical Wiring Diagram - Simplex**



\*Main disconnect and branch circuit protection to be installed by a qualified electrician in accordance with national and local codes.

## Figure 4 - 3-5 HP Basemount/Simplex Single-Phase 208/230 Volts



\*Main disconnect and branch circuit protection to be installed by a qualified electrician in accordance with national and local codes.

# Figure 5 - 3-5 HP Basemount/Simplex Three-Phase 208-230/460 Volts

# Scroll Air Compressors Tankmount/Basemount



Figure 6 - 3-5 HP Duplex Three-Phase 208-230/460 Volts

# **Replacement Parts List for SBS Models**

Ref. No.	Description	SBS Model Part Number	Otv.
1	Motor 3 HP 3 Phase	MC0223746V	1
'	Motor 3 HP 1 Phase	MC301519AV	1
	Motor 5HP 3 Phase	MC022307AV	1
	Motor 5HP 1 Phase	MC301520AV	1
2	Base	BA000301AV	1
3	Angle bracket	ST185500AV	4
4	Beltquard back	BG303800AV	1
5	Bracket	SL050700AV	1
6	Beltquard front	BG303900AV	1
7	3 HP Beltquard bracket	BG304000AV	1
	5 HP Beltguard bracket	BG304100AV	1
8	Δ Belt:		
	3 HP	BT010700AV	1
	5 HP	BT010700AV	2
9	△ Motor pulley:		
	ЗНР	PU009753AV	1
	5 HP	PU009754AV	1
10	Pressure switch	CW207559AV	1
11	Starter:		
	3 HP 230V 1 Phase	JP001045AV	1
	5 HP 230V 1 Phase	IP001046AV	1
	3 HP 230V 3 Phase	JP001047AV	1
	5 HP 230V 3 Phase	JP001049AV	1
	3 HP 460V 3 Phase	JP001048AV	1
	5 HP 460V 3 Phase	JP001050AV	1
12	90° Elbow	ST074204AV	1
13	1/2" Flare	ST126207AV	· 1
14	Discharge tube	SL300900AV	1
15	90° Flare elbow	ST126204AV	1
16	Aftercooler	SL300100AV	1
17	Left aftercooler bracket	SL300200AV	1
18	Right aftercooler bracke	t SL300300AV	1
19	∆ Check valve	IP087700AV	1
20	∆ Safety valve	V-215100AV	1
21	Scroll air end:		
	3 HP	SL014000AJ	1
	5 HP	SL016500AJ	1

( $\Delta$ ) Not shown.





# **Replacement Parts List for STS Models**

	Ref. No.	Description	STS Model Part Number	Quantity
	1	Motor:		
		3 HP 3 Phase	MC022374AV	1
		3 HP 1 Phase	MC301519AV	1
		5 HP 3 Phase	MC022307AV	1
		5 HP 1 Phase	MC301520AV	1
	2	Starter:		
		3 HP 230V 1 Phase	JP001045AV	1
		5 HP 230V 1 Phase	JP001046AV	1
		3 HP 230V 3 Phase	JP001047AV	1
		5 HP 230V 3 Phase	JP001049AV	1
		3 HP 460V 3 Phase	JP001048AV	1
		5 HP 460V 3 Phase	JP001050AV	1
	3	Receiver tank:		
		30 gallon	AR024700AJ	1
		60 gallon	AR022500AJ	1
	4	Beltguard	BT303900AV	1
	5	Motor pulley:		
		3 HP	PU009753AV	1
		5 HP	PU009754AV	1
P	6	Guard plate	BG217500AV	1
	7	Aftercooler	SL300100AV	1
	8	Tube air end/aftercooler	SL301000AP	1
	9	Tube aftercooler/tank	SL300900AP	1
	10	Check valve	IP087700AV	1
	11	Pressure gauge	GA016701AV	1
	12	Safety valve	V-215100AV	1
	13	Pressure switch	CW207573AV	<b>1</b> t
	14	Scroll air end:		
		3 HP	SL014000AJ	1
		5 HP	SL016500AJ	1
	15	Belt:		
		3 HP	BT010700AV	1
		5 HP	BT010700AV	2





# **Replacement Parts List for STD Models**

Ref. No.	Description	STD Model Part Number	Quantity
1	Motor:		
-	3 HP 3 Phase	MC022374AV	1
	3 HP 1 Phase	MC301519AV	1
	5 HP 3 Phase	MC022307AV	1
	5 HP 1 Phase	MC301520AV	1
2	Starter alternator panel:		
	3 HP 230V 1 Phase	ZZ000435AJ	1
	5 HP 230V 1 Phase	ZZ000436AJ	1
	3 HP 230V 3 Phase	ZZ000418AJ	1
	5 HP 230V 3 Phase	ZZ000419AJ	1
	3 HP 460V 3 Phase	ZZ000420AJ	1
	5 HP 460V 3 Phase	ZZ000421AJ	1
3	Receiver tank:		
	80 gallon	AR022900AJ	1
	120 gallon	AR023600AJ	1
4	Beltguard	BT303900AV	1
5	Belt:		
	3 HP	BT010700AV	2
	5 HP	BT010700AV	4
6	Motor pulley:		
	3 HP	PU009753AV	1
	5 HP	PU009754AV	1
7	Guard plate	BG217500AV	1
8	Aftercooler	SL300100AV	1
9	Tube air end/aftercooler	SL301000AP	1
10	Tube aftercooler/tank	SL300900AP	1
11	Check valve	IP087700AV	1
12	Pressure gauge	GA016701AV	1
13	Safety valve	V-215100AV	1
14	Pressure switch (Lead)	CW207558AV	1
15	Pressure switch (Lag)	CW207559AV	1
16	Scroll air end:		
	3 HP	SL014000AJ	<u>,</u> 1
	5 HP	SL016500AJ	





# **Powerex Limited Warranty**

**Powerex 3 Year / 10,000 Hour Extended Parts Limited Warranty** - Powerex warrants each Compressor Pump or Scroll Air-End against defects in material or workmanship from the date of purchase for a period of **Three years or 10,000 hours**, whichever may occur first. This warranty applies to the exchange of part(s) of the compressor pump or air-end found to be defective by an Authorized Powerex Service Center.

**Powerex 1 Year / 5,000 Hour Inlet to Outlet Limited Warranty** - Powerex warrants each Compressor Unit, System, Pump, or Air-End against defects in material or workmanship from the date of purchase for a period of **One Year or 5,000 Hours**, whichever may occur first. This warranty applies to the exchange of defective component part(s) and labor performed by an Authorized Powerex Service Center.

The above mentioned warranty applies to POWEREX manufactured units or systems only. Items listed in the operator's manual under routine maintenance are not covered by this or any other warranty.

THERE IS NO OTHER EXPRESS WARRANTY. IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILI-TY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO ONE YEAR FROM THE DATE OF PURCHASE: AND TO THE EXTENT PERMITTED BY LAW, ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED. THIS IS THE EXCLUSIVE REMEDY AND LIABILITY FOR CONSEQUENTIAL DAMAGES UNDER ANY AND ALL WAR-RANTIES IS EXCLUDED TO THE EXTENT EXCLUSION IS PERMITTED BY LAW.

All claims pertaining to the merchandise in this schedule, with the exception of warranty claims, must be filed with POWEREX within 6 months of the invoice date, or they will not be honored. Prices, discounts and terms are subject to change without notice or as stipulated in specific product quotations. All agreements are contingent upon strikes, accidents, or other causes beyond our control. All shipments are carefully inspected and counted before leaving the factory. Please inspect carefully any receipt of merchandise noting any discrepancy or damage on the carrier's freight bill at the time of delivery. Discrepancies or damage which obviously occurred in transit are the carrier's responsibility and related claims should be made promptly directly to the carrier. Returned merchandise will not be accepted without prior written authorization by POWEREX and deductions from invoices for shortage or damage claims will not be allowed. **UNLESS OTHERWISE AGREED TO IN WRITING, THESE TERMS AND CONDITIONS WILL CONTROL IN ANY TRANSACTION WITH POWEREX** any different or conflicting terms as may appear on any order form now or later submitted by the buyer. All orders are subject to acceptance by POWEREX.



# Scroll Air Compressor Service and Maintenance

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.

# Description

## GENERAL

The Powerex Oilless Rotary Scroll Air Compressor has advanced scroll compressor technology through the development of a completely oilless unit.

The Powerex Scroll Compressor offers a dynamically balanced air end which insures vibration-free operation. The rotary design permits a continuous 100% duty cycle. No oil separation, oil filtration, or inlet valves are required on the Powerex Scroll air compressor.

The Powerex oilless rotary scroll air compressor is based on the theory of scroll compression. A scroll is a free standing, intricate spiral bounded on one side by a solid, flat plane or base. A scroll set, the basic compression element of a scroll compressor, is made up of two identical spirals which form right and left hand parts. One of these scroll components is indexed or phased 180° with respect to the other so the scrolls can mesh.

Crescent-shaped gas pockets are formed and bounded by the spirals and the base plate of both scrolls. As the moving scroll is orbited around the fixed scroll, the pockets formed by the meshed scrolls follow the spiral toward the center and diminish in size. The moving scroll is prevented from rotating during this process so the 180° phase relationship of the scrolls is maintained. The compressor's inlet is at the outer boundary of the scrolls. The compressed gas is discharged through the outlet at the center of the fixed scroll so no valves are needed.

# **Dry Type Inlet Filter**

# 2500 HOURS - MAINTENANCE

The inlet filter on the scroll compressor assures 99% particulate free air is admitted to the unit. Order P/N IP032901AV for both the 3 HP and 5HP units. Change every 2,500 hours or more often in dirty locations.

- 1. Remove filter cover by releasing spring clamps (See Figure 1).
- 2. Remove wing screw.

. š. .

**ACAUTION** Do not attempt to clean filter . This filter requires replacement and is to be replaced when contaminated.

- Clean inlet plate, filter cover and six
   (6) silencer tubes using an air gun or by wiping dry with a cloth.
- 4. Install new inlet filter (Part Number IP032901AV) and reassemble cover.

See Service and Maintenance Video for Visual and Audio Instructions (Part Number IP633900AV).

# ADANGER

# Breathable Air Warning

This compressor/pump is not equipped and should not be used "as is" to supply breathing quality air. For any application of air for human consumption, the air compressor/pump will need to be fitted with suitable in-line safety and alarm equipment. This additional equipment is necessary to properly filter and purify the air to meet minimal specifications for Grade D breathing as described in Compressed Gas Association Commodity Specification for air, OSHA, ANSI and/or Canadian Standards Associations (CSA).

# DISCLAIMER OF WARRANTIES

In the event the compressor is used for the purpose of breathing air application and proper in-line safety and alarm equipment is not simultaneously used, existing warranties shall be voided, and Powerex disclaims any liability whatsoever for any loss, personal injury or damage.



# Scroll Air Compressors

# Grease Compressor searings **10,000 HOURS - MAINTENANCE** This service should ACAUTION be performed by an authorized Powerex Service Center to avoid failure. MAIN BEARINGS 1. Remove the plastic dust cap. Use only one of two locations found on the air end (See Figure 2). 2. Rotate the compressor pulley until the grease fitting is visible through the dust cap hole (See Figure 2). This will allow regreasing of the main bearings. 3. Use a grease gun extension adaptor to engage the grease fitting and supply the proper volume of grease as indicated on the grease delivery chart (See Grease Delivery chart below & Figure 2).

**CAUTION** Use only Powerex genuine grease. Pump grease gun before feeding (this liminates air from the grease passage i the extension adapter. (Complete Grease Kit Part Number IP616200AJ and Grease Tube Part Number IP600000AV).

## GREASING PIN CRANK BEARINGS

4. Replace plastic dust cap.

The bearings on the scroll compressor are regreaseable to allow extended compressor life. Service should be performed every 5,000 hours of operation.

- 1. Remove the V-Belts and the fan cover.
- Remove the air end pulley and cooling fan with a gear puller (See Figure 3).
- 3. Remove the fan duct shroud.
- Remove the three grease caps. Do not attempt to loosen or tighten the bolt.



 Grease all three pin crank bearings (See Figures 3, 4 & 5 and Grease Delivery Chart below).

The grease fitting, located in the center of the pin crank bearing, feeds only the orbit scroll side bearing. Use a needle adapter to supply grease to the housing side bearing. PUMP GREASE GUN BEFORE FEEDING TO ELIMINATE AIR FROM GREASE PASSAGE OF THE NEEDLE ADAPTER. Hold grease gun for 5 - 10 seconds after feeding to prevent grease blowback from the grease fitting.  Replace grease caps, fan shroud, pulley, etc.

(See Scroll Service and Maintenance Video for Audio and Visual Instructions.)



# **GREASE DELIVERY**

	SL	AE03	SL4	\E05
Bearing	1st Time	2nd Time	1st Time	2nd Time
Orbit Scroll Bearing	5 Times	3 Times	6 Times	4 Times
Pin Crank Bearing Orbit Scroll Side	5 Times	3 Times	6 Times	4 Times
Pin Crank Bearing Housing Side	5 Times	3 Times	6 Times	4 Times

NOTE: Each pump of the grease gun equals 0.65 grams of grease.

# Scroll Air Compressors





# **Maintenance Schedule**

ltem	Action needed	500	2500	Operating 5000	Hours 10,000	15,000	20,000	Remarks
Tank	Drain moisture	Daily						
Inlet air filter	Replace	•		(Every 2,5	00 hrs or	less)		Part #IP032901AV
Blower fan	Clean			•	•	•	•	
Fan Duct	Clean			•	•	•	•	
Compressor Fins	Clean		•	(Every 2,5	00 hrs or	less)		
Bearings	Grease							Service Center Only
Tip seal	Replace							
Dust seal	Replace	ť						
V-belt	Inspect, replace	*Note 3	•		<b></b>			
Pressure Switch	Confirm operation				•		•	
Magnetic starter	Inspect				•		•	Replace if contact points deteriorated
Safety valve	Confirm operation		•	(Every 2,5	00 hrs or	less)		
Pressure gauge	Inspect		•	(Every 2,5	00 hrs or	less)		
•	Inspect							

▲ Replace

# NOTES:

1. Inspect and perform maintenance periodically according to maintenance schedule.

- 2. The maintenance schedule relates to the normal operating conditions. If the circumstances and load condition are adverse, shorten the cycle time and do maintenance accordingly.
- 3. \* The tension of the V-belt should be adjusted during the initial stage and inspected every 2,500 hours afterwards. Proper belt tension for 3 HP units is 7 lbs./.16" deflection; for 5 HP units, 7 lbs./.19" deflection.
- 4. See Compressor Pump Manuals for replacement or service procedures.

# Tip Seal Set Replacement

# 10,000 HOURS - MAINTENANCE

The "Tip Seal Set" is a replacement part for SLAE03 and SLAE05 air ends. Please read these instructions thoroughly and carefully to ensure correct replacement.

# (See Scroll Service and Maintenance Video for Audio and Visual Instructions.)

Tip Seal Set	SLAE03	SLAE <b>05</b>
Air End Mod	el 3 Hp	5 Hp
Part No.	IP604500AV	IP604600AV

The tip seal on the scroll compressor is self-lubricated and allows the unit to operate efficiently without oil and expensive filtration. The tip seal should be replaced every 10,000 hours of operation.

## CONFIRMATION OF THE PARTS

. Confirm if the tip seal you purchased is correct for the air end you are repairing (See Parts Listing below).

ltem No.	Description	Qty.
1	HP tip seal for FS	1
2	LP tip seal for FS	1
3	HP tip seal for OS	1
4	LP tip seal for OS	1
5	Dust Seal	1
6	Backup Tube	1
HP = Hig	h Pressure LP = Lo	w Pressure

- FS = Fixed Scroll OS = Orbital Scroll
- Confirm if the following parts are included (See Figure 6).



## REPLACEMENT

- Remove six nuts with T-type wrench and then FS set from air end (See Figure 7).
- Remove LP and HP tip seals from Fixed Scroll set and Orbit set. Using the tip of a ball-point pen at the start will make it much easier (See Figure 7).
- 3. Remove dust from Scroll with clean cloth or air.

# **INSERTING TIP SEALS**

**NOTE:** Tips seals for Fixed Scroll and Orbit Scroll have opposing seal cut angels (See NOTE and explanatory diagram below). Insert tip seal so that the lip of tip seal is on the bottom of seal groove and inner side of involute and the direction of lip faces the center of involute (curving spiral). See Figure 9. This is to be done for both FS and OS sets.

- Use caution not to tear or distort lip.
- 1. Insert new HP tip seal from the center section for OS or Orbit Scroll so that there will be no clearance at the tip (start) section (See Figure 8 and 9).





**NOTE:** In order to distinguish between the tip seal for Fixed Scroll and the tip seal for Orbit Scroll place the tip seal as shown below then view from the arrow direction and refer to the figure on the right.



# Tip Seal Set Replacement (Continued)

 Insert so that new LP tip seal will contact closely with HP tip seal inside Scroll Groove (See Figure 7 on page 4).

**ACAUTION** Insert approximately half of the LP tip seal and remove the tip seal to confirm that a notch in the tip seal has been achieved. This will prevent movement during installation (See Figure 11).

- Repeat the same procedure for FS or Fixed Scroll tip seal set, remove both the dust seal and backup tube located on outermost side FS set.
- Insert new backup tube in the FS Scroll in the 6 o' clock position (See Figure 10).

- Insert new dust seal on the backup tube. Face seamed section of the dust seal in the 3 o'clock position (See Figure 10).
- 8. After replacing tip seal set, reassemble Fixed Scroll set to the Orbit Scroll. Tighten 6 nuts temporarily and confirm if crankshaft rotates smoothly by hand and tighten them firmly. Tightening torques are:

Bolt Torque	First	Second
SLAE03	15 in lb.	175 in lb.
SLAE05	15 in lb.	175 in lb.

**NOTE:** Assemble so that dust seal and tip seal will not drop between Orbit Scroll set and Fixed Scroll set.



# **Scroll Air Compressors**



Service Parts List						
Ref. No.	Description	Part No. For SLAE03	Models SLAE05	Quantity P SLAE03	er Unit SLAE05	
1	Stational Scroll Set	IP600100AV	IP600200AV	1	1	
2	Airend Pulley	IP600300AV	IP600400AV	1	1	
3	Кеу	IP600600AV	IP600600AV	1	1	
4	Centrifugal Fan	IP601300AV	IP601300AV	1	1	
5	Fan Duct (1)	IP601400AV	IP601400AV	1	1	
6	Fan Duct (2)	IP601500AV	IP601600AV	1	1	
7	Fan Cover	IP601700AV	IP601700AV	1	1	
8	Fan Dust Gasket (1)	IP601800AV	IP601900AV	1	1	
9	Heat Insulation Pipe	1P602000AV	IP602000AV	1	1	
10	Filter Plate	IP602100AV	IP602100AV	1	1	
11	Cartridge Filter	IP032901AV	IP032901AV	1	1	
12	Intake Pipe	1P602200AV	IP602200AV	1	1	
13	Intake Filter Cover	IP016101AV	IP016101AV	1	1	
14	Filter Cover Pipe	IP602300AV	IP602300AV	6	6	
15	Fan Duct Gasket (2)	IP602400AV	IP602400AV	1	1	
16	O-Ring	IP603200AV	IP603200AV	2	2	
17	Long Nipple	IP603300AV	IP603300AV	1	1	
18	Dust Cap	IP603500AV	IP603500AV	2	2	
19	Wing Bolt	IP604200AV	IP604200AV	1	1	
20	Tip Seal Set	IP604500AV	1P604600AV	1	1	

# Service Parts List

# **Powerex Limited Warranty**

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<u>Coverage</u>. The above mentioned warranty applies to Powerex manufactured units or systems only. Items listed in the operator's manual under routine maintenance are not covered by this or any other warranty. Failure to complete maintenance as stated in the maintenance schedule will void this warranty.

THERE IS NO OTHER EXPRESS WARRANTY. IMPLIED WARRANTIES, INCLUDING THOSE OF MER-CHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO ONE YEAR FROM THE DATE OF PURCHASE: AND TO THE EXTENT PERMITTED BY LAW, ANY AND ALL IMPLIED WAR-RANTIES ARE EXCLUDED. THIS IS THE EXCLUSIVE REMEDY AND LIABILITY FOR CONSEQUENTIAL DAMAGES UNDER ANY AND ALL WARRANTIES IS EXCLUDED TO THE EXTENT EXCLUSION IS PER-MITTED BY LAW.

<u>Limitation of Liability</u>. To the extent allowable under applicable law, Powerex's liability for consequential and incidental damages is expressly disclaimed. Powerex's liability in all events is limited to, and shall not exceed, the purchase price paid.

<u>Warranty Disclaimer</u>. Powerex has made a diligent effort to illustrate and describe the products in this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustrations or descriptions.

<u>Product Suitability</u>. Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Powerex attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, please review the product applications, and national and local codes and regulations, and be sure that the product, installation, and use will comply with them.

<u>Claims</u>. Claims pertaining to the merchandise in this schedule, with the exception of warranty claims, must be filed with POWEREX within 6 months of the invoice date, or they will not be honored. Prices, discounts and terms are subject to change without notice or as stipulated in specific product quotations. All agreements are contingent upon strikes, accidents, or other causes beyond our control. All shipments are carefully inspected and counted before leaving the factory. Please inspect carefully any receipt of merchandise noting any discrepancy or damage on the carrier's freight bill at the time of delivery. Discrepancies or damage which obviously occurred in transit are the carrier's responsibility and related claims should be made promptly directly to the carrier. Returned merchandise will not be accepted without prior written authorization by POWEREX and deductions from invoices for shortage or damage claims will not be allowed. **UNLESS OTHERWISE AGREED TO IN WRITING, THESE TERMS AND CONDITIONS WILL CONTROL IN ANY TRANSACTION WITH POWEREX** any different or conflicting terms as may appear on any order form now or later submitted by the buyer. All orders are subject to acceptance by POWEREX.



# **General Safety Guidelines**

# Compressed Air / Vacuum Systems

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.

# **Safety Guidelines**

This manual contains information that is very important to know and understand. This information is provided for SAFETY and to PREVENT EQUIPMENT PROB-LEMS. To help recognize this information, observe the following symbols.

# **A DANGER**

an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

Warning indicates AWARNING a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

Caution indicates a potentially haz-

**Danger indicates** 

ardous situation which, if not avoided, MAY result in minor or moderate injury.

**A NOTICE** 

Notice indicates important information that, if not followed, may cause damage to equipment.

# Unpacking

After unpacking the unit, inspect carefully for any damage that may have occurred during transit. Make sure to tighten fittings, bolts, etc., before putting unit into service.

Do not operate unit if damaged during shipping, handling or use. Damage may result in bursting and cause injury or property damage.

# General Safety Information

Since the air compressor, vacuum pump and other components (material pump, spray guns, filters, lubricators, hoses, etc.) used make up a high pressure or vacuum system, the following safety precautions must be observed at all times:

1. Read all manuals included with this product carefully. Be thoroughly familiar



with the controls and the proper use of the equipment.

- 2. Follow all local electrical and safety codes as well as in the United States, the National Electrical Codes (NEC) and Occupational Safety and Health Act (OSHA).
- 3. Only persons well acquainted with these rules of safe operation should be allowed to use the compressor.
- 4. Keep visitors away and NEVER allow children in the work area.
- 5. Wear safety glasses and use hearing protection when operating the unit.



- 6. Do not stand on or use the unit as a handhold.
- Before each use, inspect compressed air or vacuum system and electrical components for signs of damage, deterioration, weakness or leakage. Repair or replace defective items before using.
- 8. Check all fasteners at frequent intervals for proper tightness.

# AWARNING



Motors, electrical equipment and controls can cause electrical arcs that

will ignite a flammable gas or vapor. Never operate or repair in or near a flammable gas or vapor. Never store flammable liquids or gases in the vicinity of the unit.

# 

Never operate compressor or vacuum pump without a protective guard. This unit can

start automatically without warning. Personal injury or property damage could occur from contact with moving parts.

# A DANGER

# Breathable Air Warning

This unit is NOT equipped and should NOT be used "as is" to supply breathing quality air. For any application of air for human consumption, you must fit the air compressor/pump with suitable in-line safety and alarm equipment. This additional equipment is necessary to properly filter and purify the air to meet minimal specifications for Grade D breathing as described in **Compressed Gas Association** Commodity Specification for air, OSHA, ANSI and/or Canadian Standards Associations (CSA).

DISCLAIMER OF WARRANTIES IN THE EVENT THE COMPRESSOR IS USED FOR THE PURPOSE OF BREATHING AIR APPLICATION AND **PROPER IN-LINE SAFETY AND** ALARM EQUIPMENT IS NOT SIMUL-TANEOUSLY USED, EXISTING WAR-RANTIES ARE VOID, AND POWEREX DISCLAIMS ANY LIABILITY WHAT-SOEVER FOR ANY LOSS, PERSONAL INJURY OR DAMAGE.

9. Do not wear loose clothing or jewelry that will get caught in the moving parts of the unit.

# 

Surface may be hot even if the unit is stopped.



10. Keep fingers away from a running unit; fast moving and hot parts will cause injury and/or burns.

# General Safety Information

- If the equipment should start to vibrate abnormally, STOP the unit and check immediately for the cause. Vibration is generally a warning of trouble.
- 12. To reduce fire hazard, keep unit exterior free of oil, solvent, or excessive grease.

# AWARNING An ASME code safe-

ty relief valve with a setting no higher than the tank maximum allowable working pressure MUST be installed in the air lines or in the tank of any compressor. The ASME safety valve must have sufficient flow and pressure ratings to protect the pressurized components from bursting. The flow rating can be found in the parts manual.

# **A** CAUTION

with pressure switch or pilot valves set higher than the tank maximum allowable working pressure.

Do not operate

 Never attempt to adjust ASME safety valve on compressed air units. Keep safety valve free from paint and other accumulations.

# A DANGER

Never attempt to repair or modify a tank! Welding, drilling or any other modification will

weaken the tank resulting in damage from rupture or explosion. Always replace worn, cracked or damaged tanks.



Drain liquid from tank daily.

- 14. Tanks rust from moisture build-up, which weakens the tank. Make sure to drain tank regularly and inspect periodically for unsafe conditions such as rust formation and corrosion.
- 15. Fast moving air will stir up dust and debris which may be harmful. Release air slowly when draining moisture or depressurizing a compressor system.

# Installation

# **A**WARNING

Disconnect, tag and lock out power source then release all pressure from the system

before attempting to install, service, relocate or perform any maintenance.

**A CAUTION** appropriately rated equipment. Be sure the unit is securely attached to lifting device used. Do not lift unit by holding onto tubes or coolers. Do not use unit to lift other attached equipment.

# **A CAUTION** Never use the wood shipping skids for mounting the unit.

Install and operate unit at least 24" from any obstructions in a clean, well ventilated area. The surrounding air temperature should not exceed 104° F. This will ensure an unobstructed flow of air to cool unit and allow adequate space for maintenance.

# **A CAUTION** Do not locate the air inlet near steam, paint spray, sandblast areas or any other source of contamination.

**NOTE:** If compressor system is installed in a hot, moist environment, supply compressor pump with clean, dry outside air. Pipe supply air in from external sources.

# TANK MOUNTING

Bolt tank on a flat, even, concrete floor or on a separate concrete foundation. Use vibration isolators between the tank leg and the floor. After placing unit on vibration pads, **do not draw bolts tight**. Allow the pads to absorb vibrations. Install a flexible hose or coupling between the tank and service piping.

# **AWARNING**

Failure to properly install the tank can lead to cracks at the welded joints and possible bursting or leakage.



# PIPING

AWARNING Never use plastic (PVC) pipe for compressed air. Serious injury or death could result.

Any tube, pipe or hose connected to the unit must be able to withstand the temperature generated and retain the pressure. All pressurized components of the air system must have a pressure rating higher than or equal to the ASME safety valve setting. Incorrect selection and installation of any tube, pipe or hose could result in bursting and injury.

# **INSTALLING A SHUT-OFF VALVE**

Install a shut-off valve on the discharge port of the compressor tank to control the air flow out of the tank. Locate the valve between the tank and the piping system.

# AWARNING between a compressor pump and the tank without an appropriate safety valve. Personal injury and/or equipment damage may occur. Never use reducers in discharge piping.

When creating a permanently installed system to distribute compressed air, find the total length of the system and select pipe size from the chart. Bury

# MINIMUM PIPE SIZE FOR COMPRESSED AIR LINE

CFM	Leng 25'	th Of Pi 50'	iping Sy 100′	stem 250'		
10	1/2"	1/2″	1/2"	3/4"		
-20	3/4	3/4	3/4	1		
40	3/4	1	1	1		
60	3/4	1	1	1		
100	1	1	1	11/4		

# MINIMUM PIPE SIZE FOR VACUUM SYSTEMS

CFI	L VI 2:	ength ( 5′ 5	Of Pipin O' 10	g Syste )0′2	m 50′	
10	) 3/	4" 3/	/4" 1	" 1	11	
20	) 3/-	4 3/	/4 1	1		
-4(	) 1	1	1/4 1	1/4 1	Ж	
60	) 12	£ 1;	1/2 1	½ 2		
100	2	2	3	3	}	



2

underground lines below the frost line

avoid pockets where condensation gather and freeze.

Apply air pressure to the piping installation and make sure all joints are free from leaks BEFORE underground lines are covered. Before putting the unit into service, find and repair all leaks in the piping, fittings and connections.

# WIRING

AWARNING All wiring and

electrical connections must be performed by a qualified electrician. Installations must be in accordance with local and national codes.

**A CAUTION** Overheating, short circuiting and fire damage will result from inadequate wiring.

Wiring must be installed in accordance with National Electrical Code and local codes and standards that have been set up covering electrical apparatus and wiring. Consult the codes and standards and observe local ordinances. Be certain that adequate wire sizes are ed. and that:

. Service is of adequate ampere rating.

- 2. The supply line has the same electrical characteristics (voltage, cycles and phase) as the motor.
- 3. Ensure the line wire is the proper size and that no other equipment is operated from the same line. The chart gives minimum recommended wire sizes for horsepower of motor provided.

# MINIMUM WIRE SIZE USE 75°C COPPER WIRE

	Single Phase	Three Phase		
HP	230V	208/230V	460/575V	
3	10AWG	14 AWG	14 AWG	
5	8 AWG	12 AWG	14 AWG	
7.5	8 AWG	10 AWG	12 AWG	
10	N/A	8 AWG	12 AWG	
15	N/A	6 AWG	10 AWG	
25	N/A	3 AWG	8 AWG	

<sup>o</sup>ecommended wire sizes may be larger an the minimum set up by local ordinances. If so, use the larger size wire to prevent excessive line voltage drop. The additional wire cost is very small compared with the cost of repairing or replacing a motor electrically "starved" by the use of supply wires which are too small.

# GROUNDING

# A DANGER

Improperly grounded electrical components are shock hazards. Make

sure all the components are properly grounded to prevent death or serious injury.

This product **must** be grounded. Grounding reduces the risk of electrical shock by providing an escape wire for the electric current if short circuit occurs.

# MOTOR HOOKUP AND STARTER

Branch circuit protection must be provided as specified in National Electrical Code, Chapter 2, "Wiring Design and Protection." Article 210, using the applicable article "For Motors and Motor Controllers," (Article 430).

# DIRECTION OF ROTATION

**NOTE:** Improper rotation will result in reduced unit life or unit failure. The direction of rotation is indicated near the motor(s).

The proper difection is very important. The direction of rotation of 3 phase motors can be reversed by interchanging any two motor-line leads. For single phase motors, refer to the motor nameplate.

**IMPORTANT:** Check motor rotation before operating the unit.

# GENERAL WIRING DIAGRAMS

**A NOTICE** *wiring diagram for more specific information.* 



# Figure 1 - Single Phase Wiring Diagram



## Figure 2 - Three phase wiring diagram

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Notes





- Verify flow direction. (stamped on valve body)
- Valve can be mounted in any position.

MAINTENANCE

- Install a condensate drain on the outlet side of drain valve for proper . collection and drainage of condensate.
- If tubing is used for draining, Beware of "Whipping" when valve is open.
- Remove Contact Block from connector and attach wires as shown at right.

# SPECIFICATIONS

Interval time (T2) Discharge time (T1) Supply Voltage **Current Consumtion** Operating Temperature Environmental Protection Case Material Connection

1

2

з

### TIMER .5 - 45 minutes

.5 - 10 seconds 12v-240v 50/60Hz (+/- 10%) 4mA Max. -10°C to +50°C NEMA 4 **ABS Plastic FR Grade** DIN 43650A ISO 4400/6952

1

1

2

3

4

# REPLACEMENT PARTS

Description – Electric Cord (6 foot Length - Din Connector - Conduit Conn	Part No. 3021457F0000 Molded Din) C18209N2 ector M550Z-RB
- Timer	8201 (24v-240v) 8070 (10v-30v)
- Coil	,
Standard	
24v AC	297300
48v AC	295210
115v AC	42320
230v AC	42300
12v DC	297500
24v DC	42360
<ul> <li>Valve Only</li> </ul>	321496
Valve Assy.	(Valve & Coil)
1/2"-115V	321492
1⁄2"-230V	321493

Set DISCHARGE time(T1) using LEFT adjusting knob.

Set T1 to 2 seconds and T2 to 20 minutes.

(Adjust as necessary)

The SL300AV has a built in strainer.

We recommend periodically checking to ensure strainer

has not clogged.

Testing the drain is accomplished by pressing on the

test area of the timer.

# TIMER SETTING

300 PSI

5/32" - 4.0MM

+/ 10%

Any position

Thermal Group H

190°F Max.

Forged Brass I

IP 65/Nema 4

35°F - 130°F Ambient

12v - 240v (see coil for correct supply)

Set Interval time (T2) using Right adjusting knob.

Туре In/Out Ports

WHEN INSTALLING THE ELECTRONIC DRAIN VALVE MAKE SURE: POWER IS TURNED OFF AIR SYSTEM IS DRAINED (ZERO PRESSURE) CONTACT BLOCK FRONT 2

SL300AV SERIES DRAIN



# VALVE 2-way direct acting valve 3/8"NPT X 1/2"PT Male Inlet

Max. Working Pressure

Media Temperature

Valve Body

Environmental Protection

Orifice

Insulation

Mounting

Supply Voltage Voltage Tolerance

Operating Temperature

# 

Ersatzteilliste Spare parts list Liste de pièces de rechange Listino pezzi di ricambio Lista de piezas de recambio Lista de peças sobresselentes Reserveonderdelenlijst Reservedelsliste Reservdelslista 
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 Varaosaluettelo

 Wykaz czéœci zamiennych

 Seznam náhradních dílù

 Tartalékalkatrész lista

 Κατάλογος ανταλλακτικών

 Перечень запасных частей

 备用零件目录

 スペアパーツリスト

11

# KDT 3.60 KDT 3.80



X	Pos.	Bestell Nr.	Beschreibung	10 January 14
		549000 21100	DICHTUNGSSATZ "	
	6	000100 21600	GEHAUSE KDT 3.60	
	6	000100 21100	GEHÄUSE, KDT 3.80	
	9	020004 21100	KOLBEN	
	11	901330 00000	SCHIEBER (4x) 2)	
	15	000801 21100	SEITENDECKEL	
	16	000701 21100	SEITENDECKEL	
	18	001000 21100		
	20	025511 21100	DICHTUNG	
	24	911312 00000	DICHTUNGSSCHLAUCH	
	26	917152 00000	AUSGLEICHSCHEIBE	
	27	906540 00000	WELLENDICHTRING	
	28	906612 50000	WALZLAGER 3205 2RS C3 TA	
	29	906657 00000	WALZLAGER NU 205/ZS	
	31	511400 10100	SATZ DISTANZSCHEIBEN	
	37	945217 00000	SECHSKANTSCHRAUBE	
	30	010801 21100	SENKSCHDALIDE	
	41	945224 00000	SECHSKANTSCHBAUBE	- Television
	42	945220 00000	SECHSKANTSCHRAUBE	
	45	948742 00000	PASSKERBSTIFT	
	47	947736 00000	PASSFEDER	
	50	053201 21100	LATERNE	
	52	950308 00000	UNTERLEGSCHEIBE	·······
	53	945337 00000		
	57	949409 00000		
	61	040101 21100	FILTERGEHÄUSE	
	62	025501 21100	DICHTUNG	
	64	946955 00000	STIFTSCHRAUBE	
	65	951003 00000	STIFTSCHRAUBE	
	67	964407 00000	SCHALLDÄMPFERROHR	
	68	909507 00000	FILTERPATRONE C 1112/2 (1x) 2)	
	71	009000 27000	ANPRESSFEDER	
	72	948750 00000		
	75	040201 21100		
	76	025516 21100	DICHTUNG	
	77	022802 21100	FILTERTRÄGER	
	79	945320 00000	INNENSECHSKANTSCHRAUBE	
	80	946944 00000	STIFTSCHRAUBE	
	81	947504 00000	UNTERLEGSCHEIBE	
	82	947104 00000	SECHSKANTMUTTER	
	83	952019 00000	DICHTUNG	
	86	025515 21100	DICHTUNG	
	88	560203 21100	KÜHLER	
	91	909510 00000	FILTERPATRONE C 713 (1x) 2)	
	93	946965 00000	STIFTSCHRAUBE	
	94	947105 00000	SECHSKANTMUTTER	
	95	949450 00000	U-SCHEIBE	
	97	950304 00000	U-SCHEIBE	
	98	945322 00000		
	103	025512 21100		
	104, -	945319 00000		
	110	921500 50000	HANDGRIFF	
	121	560204 21100	KÜHLER	
	125	025504 21100	DICHTUNG	

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KDT 3.60 - 3.80

Pos. Bestell Nr. Beschreibung	IRAUBE
	IRAUBE
	IRAUBE
2 127 025517 21100 DICHTUNG	IRAUBE
129 945372 00000 INNENSECHSKANTSCH	IRAUBE
130 945328 00000 INNENSECHSKANTSCH	
132 946930 00000 STIFTSCHRAUBE	
005602 21100 DECKEL	
141 016606 21100 ANSCHLUSS-STUCK	
146 025507 21100 DICHTUNG	
148 945368 00000 INNENSECHSKANTSCH	IRAUBE _
149 741310 30000 GUMMIPUFFER	
▲ 161 918300 21100 ABDECKHAUBE	
163 920800 21100 LUFTLEITHAUBE	
165 960700 21100 LUFTERHAUBE	
166 960701 21100 LUFTERHAUBE	
170 945321 00000 INNENSECHSKANTSCH	HAUBE
171 945371 00000 INNENSECHSKANTSCH	HAUBE
173 949806 00000 SENKSCHRAUBE	
174 951703 00000 FEDERSCHEIBE	
175 741302 00000 GUMMIPUFFER	
176 945634 00000 GEWINDESTIFT	
178 951602 00000 HINGMUTTER	
184 051016 00000 KARELTÜLLE	
104 951910 00000 RABELTULLE	
105 940772 00000 HOTRINIETE	
190 951018 00000 STIFTSCHRAUBE	INAOBE
191 947506 00000 UNTERLEGSCHEIRE	
192 947106 00000 SECHSKANTMUTTER	
195 902108 00000 KUPPLUNGSHÄLETE (N	(TON
196 902209 00000 KUPPLUNGSSCHEIBE /	GELB
197 544501 21100 GEBLÄSEKUPPI UNG M	AT VENTILATOR
285 728000 99622 DRUCKREGULIERVENT	TL / 0.6 BAR
285 728001 99622 DRUCKREGULIERVENT	TL / 1.0 BAR
285 728002 99622 DRUCKREGULIERVENT	TL / 2.0 BAR
268 948066 00000 DICHTRING	
290 964307 00000 SCHALLDAMPFERROH	R
291 912805 00000 VERSCHLUSS-STOPFE	N
400 769302 40840 FREQUENZUMFORMER	3
401 961301 19600 DICHTUNG	
402 945315 00000 INNENSECHSKANTSCH	HRAUBÉ

"Dichtungssatz - 54900021100 - Pos.: 20, 24, 62, 75, 76, 85, 86, 104, 125, 126, 127, 146, 288 a erforderliche Bestellmenge / Wartung



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	·~ .		
	Pos.	Ident No.	Description
inter i		549000 21100	SET OF SEALS 1
		000100 21600	PUMP BODY KDT 2 60
	6	000100 21000	PUMP BODY, KDT 3.80
	9	020004 21100	ROTOR
1	11	901330 00000	CARBON VANES (4x) 2)
	15	000801 21100	LID
1	16	000701 21100	LID
	18	001100 21100	BEARING COVER
	19	001000 21100	BEAHING COVER
	20	025511.21100	SEAL
	24	917152 00000	COMPENSATING DISC
	27	906540 00000	SHAFT-SEALING BING
	28	906612 50000	BALL BEARING
	29	906657 00000	BALL BEARING
	31	511400 10100	SET DISTANCE DISC
	37	945217 00000	HEX HEAD SCREW
	38	016801 21100	CLAMPING DISC
	39	949807 00000	SCREW
	41	945224 00000	HEX-HEAD SCHEW
	42	945220 00000	STRAIGHT PIN
	45	947736 00000	KEY
	50	053201 21100	CONNECTION FLANGE
	52	950308 00000	WASHER
	53	945337 00000	SOCKET HEAD SCREW
	57	949409 00000	WASHER
	58	945270 00000	SHAFT END BOLD
	61	040101 21100	FILTER HOUSING
	62	025501 21100	GASKET
	64	946955 00000	STUD
	65	951003 00000	STUD
	67	909507 00000	
		009000 27000	LEAE SPRING
	72	948750 00000	BLIND BIVET
	73	040201 21100	FILTER-COVER
	75	025518 21100	GASKET
	76	025516 21100	GASKET
	77	022802 21100	FILTER HOLDER
	79	945320 00000	SOCKET HEAD SCREW
	80	946944 00000	STUD
	81	947504 00000	
	83	952019 00000	LOCATING PEG
	85	025514 21100	GASKET
	86	025515 21100	GASKET
	88	560203 21100	COOLER
	91	909510 00000	FILTER CARTRIDGE C 713 (1x) 2)
	93	946965 00000	STUD
	94	947105 00000	HEX.NUT
	.95	949450 00000	WASHER
	97	950304 00000	WASHER
	98	945322 00000	SOURET HEAD SUREW
	104	025513 21100	
	105	945319 00000	SOCKET HEAD SCREW
	110	921500 50000	HANDLE
	121	560204 21100	COOLER
	125	025504 21100	GASKET

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KDT 3.60 - 3.80

		- Part - Mail and a company of the second	
D	Pos.	Ident No.	Description
KDT 3.60 - 3.80	Pos. 126 127 129 130 132 134 141 146 148 149 161 163 165 166 170 171 173 174 175 176 178 182 184 185 186 188 190 191 192 195 196 197 285	Ident No. 025512 21100 025517 21100 945372 00000 945328 00000 945328 00000 005602 21100 016606 21100 025507 21100 945368 00000 918300 21100 960700 21100 960700 21100 960700 21100 945321 00000 945321 00000 945321 00000 945634 00000 951916 00000 94572 00000 945333 00000 94572 00000 945333 00000 947506 00000 947506 00000 947106 00000 947106 00000 947106 00000 902108 00000 902108 00000 942504 00000 947106 00000 947106 00000 902108 00000 902108 00000 9451 21100 728000 99622	Description
	285 285 288 290 291 400	728001 99622 728002 99622 948066 00000 964307 00000 912805 00000 769302 40840	PRESSURE REGULATING VALVE / 14,5 PSI PRESSURE REGULATING VALVE / 29 PSI SEALING RING SILENCER TUBE PLUG FREQUENCY, CONVERTOR
	401 402	945315 00000	GASKET SOCKET HEAD SCREW

 $^{\eta}$  Set of seals - 54900021100 - Pos.: 20, 24, 62, 75, 76, 85, 86, 104, 125, 126, 127, 146, 288  $^{2}$  necessary order quantity / maintenance

F



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D	Pos.	No. Identificazione	Designazione
80		549000 21100	SERIE DI GUARNIZIONE "
7	6	000100 21600	CARCASSA, KDT 3.60
0	6	000100 21100	CARCASSA, KDT 3.80
	9	020004 21100	ROTORE
<u> </u>	11	901330 00000	PALETTE DI CHARBONE (4x) 2)
9	15	000801 21100	COPERCHIO
e	16	000701 21100	COPERCHIO
<b>—</b>	18	001100 21100	COPERCHIO CUSCINETTO
5	19	001000 21100	COPERCHIO CUSCINETTO
5	20	025511 21100	GUARNIZIONE
<u>×</u>	24	911312 00000	GUARNIZIONE
	26	917152 00000	DISCO COMPENSATORE
	27	906540 00000	GUARNIZIONE PER L'ALBERO
	28	906612 50000	CUSCINETTO A SFERA
	29	906657 00000	CUSCINETTO A SEEBA
	31	511400 10100	SERIE DISCO GIUOCO
	37	945217 00000	VITE ESAGONALE
	38	016801 21100	DISCO DI FISSAGIO
	30	949807 00000	VITE
		945224 00000	VITE ESAGONALE
	42	945220 00000	VITE ESAGONALE
	42	949220 00000	PERNO
	45	947736 00000	CHIAVETTA
	47 50	052201 21100	
	50	055201 21100	BONDELLA
	- 52	945227 00000	
	53	949337 00000	
	57	949409 00000	
	00	945270 00000	
	60	040101 21100	
	64	025501 21100	
		946955 00000	
	60	951003 00000	
	67	964407 00000	
	68	909007 00000	MOULA
	71	009000 27000	
	72	948750 00000	
	- 13	040201 21100	
	/5	025518 21100	GUARNIZIONI
	76	025516 21100	SUPPORTO ENTRO
		022802 21100	
	79	945320 00000	
	80	946944 00000	
	81	947504 00000	BONDELLA DADO ESACONALE
	82	94/104 00000	DADU ESAGUNALE
	83	952019 00000	SPINE DI HISCONTRO
	85	025514 21100	GUARNIZIONE
	86	025515 21100	GUARNIZIONE
	88	560203 21100	RAFFREDDATORE
	91	909510 00000	CARTUCCIA FILTRO C 713 (1x) 2
	93	946965 00000	L'ASTA A VITE
	94	947105 00000	DADO ESAGONALE
	95	949450 00000	RONDELLA
	97	950304 00000	RONDELLA
	, 98	945322 00000	VITE ESAGONALE INTERNA
	103	068801 21100	COPERCHIO
	104	025513 21100	GUARNIZIONE
	105	945319 00000	VITE ESAGONALE INTERNA
	110	921500 50000	MANETTA
	121	560204 21100	RAFFREDDATORE
	125	025504 21100	GUARNIZIONE

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)	Pos.	No. Identificazione	Designazione	
x	-		(Manual Marange Mana) ( an airs a na an airs ( Malantana y Malanta Statement	
	126	025512 21100	GUARNIZIONE	
	127	025517 21100	GUARNIZIONI	
	129	945372 00000	VITE ESAGONALE INTERNA	
	130	945328 00000	VITE ESAGONALE INTERNA	
	132	946930 00000	L'ASTA A VITE	
	134	005602 21100	COPERCHIO	
	141	016606 21100	PEZZI RACCORDI	
	146	025507 21100	GUARNIZIONE	
	148	945368 00000	VITE ESAGONALE INTERNA	
	149	741310 30000	AMMORTIZZATORE IN GOMMA	
	161	918300 21100	CARTER	
	163	920800 21100	CAPPOTTA DEL CONDOTTA ARIA	
	165	960700 21100	CAPPOTTA DEL VENTILATORE	
	166	960701 21100	CAPPOTTA DEL VENTILATORE	
	170	945321 00000	VITE ESAGONALE INTERNA	
	171	945371 00000	VITE ESAGONALE INTERNA	
	173	949806 00000	VITE A TESTA SVASATA	
	174	951703 00000	DISCO A MOLLA	
	175	741302 00000	AMMORTIZZATORE IN GOMMA	
	176	945634 00000	SPINA FILETTATUBA	
	178	951602 00000	GOLFARE CON FORO FILETTATO	
	182	014900 21100	FLANGE	
	184	951916 00000	PROTEZIONE IN GOMMA	
	185	948772 00000	CHIODO TUBOLABE	
	186	947508 00000	BONDELLA	
	188	945333 00000	VITE ESAGONALE INTERNA	
	190	951018 00000	L'ASTA A VITE	
	191	947506 00000	BONDELLA	· ·
	192	947106 00000	DADO ESAGONALE	
	195	902108 00000	GIUNTO	
	196	902209 00000	DISCO GUINTO	
	197	544501 21100	GUINTO CON VENTILATORE	
	285	728000 99622		B
	285	728001 09622	VALVOLA REGULAZ PRESSIONE / 10 BA	8
	285	720001 99022		
	200	048066 00000		n
	200	948066 00000		
	200	912805 00000		
	400	769302 40940		
	400	05302 40040		·
	401	945215 00000		
	402	940010 UUUUU	TE ESAGONALE INTERNA	

<sup>1)</sup> Serie di guarnizione - 54900021100 - Pos.: 20, 24, 62, 75, 76, 85, 86, 104, 125, 126, 127, 146, 288
<sup>2)</sup> quantità di ordinazione necessari / manutenzione

KDT 3.60 KDT 3.80	USA /0-05 /0-34 /0-52 /0-54 /0-400 /6	Tutte tipi Modello speciale - protezione anti-corrosione Modello speciale - > flusso in volume Modello speciale - protezione anti-corrosione e palette speciale Modello speciale - refrigerazione Modello speciale - con convertitore di frequenza Modello speciale - protezione anti-corrosione
, ' Vedere a	/B5-200	Modello speciale - flangia del motore

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KDT 3.60 - 3.80

	Pos.	No. De pedido	Descripción
		549000 21100	
	6	000100 21600	CARCASA, KDT 3.60
	6	000100 21100	CARCASA, KDT 3.80
	9	020004 21100	ÉMBOLO
	11	901330 00000	
	15	000801 21100	
-	18	001100 21100	
	19	001000 21100	TAPA DE COJINETE LADO B
	20	025511 21100	JUNTA
	24	911312 00000	MANGUERA DE JUNTA
	26	917152 00000	ARANDELA DE COMPENSACIÓN
	27	906540 00000	ANILLO DE JUNTA DE ÁRBOL
	28	906612 50000	COJINETE DE RODAMIENTO 3205 2RS C3 TA
	29	906657 00000	COJINETE DE RODAMIENTO NU 205/ZS
-	31	511400 10100	JUEGO DE ARANDELAS DISTANCIADORAS
	37	945217 00000	TORNILLO DE CABEZA HEXAGONAL
	38	016801 21100	
~	39	949807 00000	
	41	945224 00000	
	42	948742 00000	PASADOR ENTALLADO DE A JUSTE
	47	947736.00000	LENGUETA DE AJUSTE
	50	053201 21100	FAROL
	52	950308 00000	ARANDELA
~	53	945337 00000	TORNILLO HEXAGONAL INTERIOR
	57	949409 00000	ARANDELA
	58	945270 00000	TORNILLO TERMINAL DE ÁRBOL
	61	040101 21100	CARCASA DE FILTRO
	62	025501 21100	JUNTA
-	64	946955 00000	ESPARRAGO
	67	951003 00000	
	68	909507 00000	
-	71	009000 27000	MUELLE DE PRESIÓN
	72	948750 00000	REMACHE CIEGO
	73	040201 21100	TAPA DE FILTRO
-	75	025518 21100	JUNTA
	76	025516 21100	JUNTA
		022802 21100	SOPORTE DE FILTRO
	79	945320 00000	
	80	946944 00000	
	- 01	947504 00000	
	83	952019 00000	
	85	025514 21100	JUNTA
	86	025515 21100	JUNTA
	88	560203 21100	REFRIGERADOR
	91	909510 00000	CARTUCHO DE FILTRO C 713 (1x) 2)
	93	946965 00000	ESPÁRRAGO
	94	947105 00000	TUERCA HEXAGONAL
-	95	949450 00000	AHANDELA
	97	950304 00000	
	98	945322 00000	TADA
-	103	025513 21100	
	105	945319 00000	
	110	921500 50000	EMPUÑADURA
-	121	560204 21100	REFRIGERADOR
	105	025504 21100	ILINITA

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D	Pos.	No. De pedido	Descripción
0	126	025512 21100	JUNTA
õ	127	025517 21100	JUNTA
<b>.</b>	129	945372 00000	TORNILLO HEXAGONAL INTERIOR
Ϋ́	130	945328 00000	TORNILLO HEXAGONAL INTERIOR
Ċ	132	946930 00000	ESPARRAGO
ö	134	005602 21100	TAPA
	141	016606 21100	PIEZA DE EMPALME
60	146	025507 21100	JUNTA
⊢	_148	945368 00000	TORNILLO HEXAGONAL INTERIOR
	149	741310 30000	AMORTIGUADOR DE GOMA
Y	161	918300 21100	CAPERUZA DE HECUBRIMIENTO
	163	920800_21100	
	165	960700 21100	
	166	960701 21100	
	1/0	945321 00000	
	171	945371 00000	
	173	949808 00000	
	175	741302 00000	AMORTIGUADOR DE GOMA
	175	945634 00000	VABILLA BOSCADA
	178	951602 00000	TUEBCA DE CÁNCAMO
	182	014900 21100	BRIDA INTERMEDIA
	184	951916 00000	BOOUILLA DE CABLE
	185	948772 00000	REMACHE TUBULAR
	186	947508 00000	ARANDELA
	188	945333 00000	TORNILLO HEXAGONAL INTERIOR
	190	951018 00000	ESPÁRRAGO
	191	947506 00000	ARANDELA
	192	947106 00000	TUERCA HEXAGONAL
	195	902108 00000	MITAD DE ACOPLAMIENTO (MOT)
	196	902209 00000	DISCO DE ACOPLAMIENTO / AMARILLO
	197	544501 21100	ACOPLAMIENTO DE SOPLADO CON VALVULA
	285	728000 99622	VÁLVULA REGULADORA DE PRESION / 0,6 BAR
	285	728001 99622	VALVULA REGULADORA DE PRESION / 1.0 BAR
	285	728002 99622	VALVULA REGULADORA DE PRESION / 2,0 BAR
	288	948066 00000	ANILLO DE JUNTA
	290	964307 00000	TUBO DE SILENCIADOR
	291	912805 00000	TAPON DE DESGASTE
	400	769302 40840	CONVERTIDOR DE FRECUENCIA
	401	961301 19600	
	402	945315 00000	IOHNILLO HEXAGONAL INTERIOR

<sup>1)</sup> Junta completa - 54900021100 - Pos.: 20, 24, 62, 75, 76, 85, 86, 104, 125, 126, 127, 146, 288 2) cantidad necesario / mantenimiento



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	Variante(n)	Pos 2)	Bestell Nr. / Ident No.	/ No. Identification /	Beschreibung / Description / Designation / Designatione / Desripcion
en optionale optionale opcional	ModIfications Variantes		No. Identificaziona /	No. De pedido	
KDT 3.60/XX	NSA	190 191 192 195	902100 21100 902100 21100 902100 21300	951018-00000 947506-00000 947106-00000 947106-00000 902108-00000 902108-00000	STIFTSCHRAUBE / STUD / PRISCHHIER / L'AS FA A VITE / ESFÄHRAGO UNTERLEGSCHEIRE / WASHER / ROHDELLE / ROHDELLA / ARANDELA SECHSKANTMUTTER / HEX NUT / ECROU A 6 PANS / DADO ESAGONALE / TUERCA NEXAGONAL KDT 3.60 - MOTORKUPPLUNG / COUPLING / ACCOUPLEMENT / GIUNTO / ACOPLAMIENTO KDT 3.80 - MOTORKUPPLUNG / COUPLING / ACCOUPLEMENT / GIUNTO / ACOPLAMIENTO KDT 3.80 - MOTORKUPPLUNG / COUPLING / ACCOUPLEMENT / GIUNTO / ACOPLAMIENTO
KDT 3.80/XX	/0-05	ი	020005 21100	020004 21100	KOLBEN / ROTOR / PISTON / ROTORE / ÉMBOLO
	/0-34	9 <u>6</u>	000103 21100 040102 21100	000100-21100 040101-21100	GEHÁUSE / PUMP BODY / CORP DE POMPE / CARCASSA / CARCASA FILTERGEHÁUSE / FILTER HOUSING / BOITE POUR FILTRE / CARCASSA DEL FILTRO / CARCASA DE FILTRO
,	/0-52	9 11 285 403	020005 21100 901379 00000 734000 02000	620004-21100 991330-00000 72000X-99622	KOLBEN / ROTOR / PISTON / ROTORE / ÉMBOLO SCHEBER / VANES / PALETTE / PALETTE / EMPUJADOR DRUCIGEGULERVENTIL / PAESSURE REGULATING VALVE / SCUPALE REGLAGE PHESSION / VALVOLA REGULADORA DE PRESIÓH DRUCIGEGULERVENTIL 2/2 BAR / PRESIÓH DRUCKREGULERVENTIL 2/2 BAR / PRESIÓH VALVOLA REGULAZIONE PRESSIONE 2/2 BAR / VÁLVULA REGULADORA DE PRESIÓN 2/2 BAR /
	/0-54	88 166 210 230	560700 21100 019901 21100	560203 21100 960701-21100	WITTER- A COOLEN / REFRICIDISSEUR - INFERENDATORE / REFRIGERADOR IU/FTER-HAUBE / VENTILATOR HOOD / CARTER DE VENTILATEUR / CAPPOTTA DEL VENTILATORE / CAPERNUS- DE VENTILATOR IU/FTER-HAUBE / VENTILATOR HOOD / CARTER DE VENTILATEUR / CAPOTTA DEL VENTILATORE / CAPERNUS- DE VENTILADOR UMLENKSTÜCK / RETURN PIECE / PIECE DE RETOUR / PEZZO INVERSIONE / PIEZA DE DESVIACIÓN
ν κ κτ τι τ <sub>ανα μ</sub>	/0-40D	61 141 400 401 402 405	040103 21100 016608 21100 769302 40840 961301 19600 945315 00000 769302 42100	040101-21100 016606-21100	FILTERGEHÁUSE / FILTER HOUSING / BOITE POUR FILTRE / CONTENITORE FILTRO / CARCASA DE FILTRO ANSCHLUSS-STÜCK / CONNECTING PIECE / PIECE RACCORD / PEZZI RACCORDI / PIEZA DE EMPALME FREQUENZUMPORMER / FREQUENCY CONVERTOR / CONVERTISSEUR DE FRÉQUENCE / CONVERTITORE DI FREQUENZ CONVERTIDOR DE FRECUENCIA - DICHTUNG / GASKET / JOINT / GUARMIZIONE / JUNTA INNENSECHSKANTSCHRAUBE / SOCKET HEAD SCREW / VIS HEXAGONALE INTERNE / VITE ESAGONALE INTERNA / TORI HEXAGONAL INTERIOR MESSUMFORMER / MESUREMENT CONVERTER / CONVERTISSEUR DE MESURE / CONVERTITORE DI MISURA / MESSUMFORMER / MESUREMENT CONVERTER / CONVERTISSEUR DE MESURE / CONVERTITORE DI MISURA / CONVERTIDOR DE MEDIDA
		ဖြစ်စိုစ်	000110 21100 020011 21100 000811 21100 000811 21100	000100 21100 020004 21100 000801 21100 000801 21100	GEHÀUSE / PUMP BODY / CORP DE POMPE / CARCASSA / CARCASA KOLBEN / ROTOR / PISTON / ROTORE / ÉMBOLO SEITENDECKEL / LID LATERAL / COUVERCLE LATÉRAL / COPERCHIO LATERALE / TAPA LATERAL SEITENDECKEL / LID LATERAL / COUVERCLE LATÉRAL / COPERCHIO LATERALE / TAPA LATERAL
	/85/200	182	014900 21600 902100 21600	00000 001400 00000 001400 00000 001400	ZWISCHENFLANSCH / INTERMEDIATE FLANGE / BRIDE INTERMEDIAIRE / FLANGE INTERMEDIA / BRIDA INTERMEDIA MOTORKUPPLUNG / COUPLING / ACCOUPLEMENT / GIUNTO / ACOPLAMIENTO
				( <u>( 1997) - 20</u> 200	

121105 1211005 121105 121105 121105 121105 121105 121105 121105 1



Wartung Maintenance Entretien Manutenzione Mantenimiento				
	Pos.	Menge * Quantity * Quantité * Quantità * Cantidad *	Bestell-Nr. Ident No. No. Identification No. Identificazione No. de pedido	Bezeichnung Description Designation Designazione Descripcion
3.80	•	1	549000 21100	Dichtungssatz, Complete set of seals, Jeu de joints, Kit di guarnizioni, Junta Completa
- 00	11	4	901330 00000	Schieber, Rotor Vane, Palette, Silenciado
KDT 3.6	68	. 1	909507 00000	Filterpatrone, Filter cartridge, Cartouche Filtrante, Cartuccia filtro, Cartucho de filtro
	91	1. , ·	909510 00000	Filterpatrone, Filter cartridge, Cartouche Filtrante, Cartuccia filtro, Cartucho de filtr
	A	1		
			3	

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Vacuum pumps • Compressors

# Application

Vacuum pumps KVT 3.60, 3.80, 3.100, 3.140 Compressors KDT 3.60, 3.80, 3.100, 3.140 Pressure vacuum pumps DVT 3.60-3.140 These operating instructions apply to:

# Safety Regulations

.

on Regulations VBG 16, Compressors, in particu-Please comply with Accident Preventi-Pumps may only be converted or modified after lar Section IIIc "Installation" and IV "Operation" plus VBG 4 "Electrical equipment and tools" approval by the manufacturer.

# Application

Inlet air must be standard dry atmospheric air. Do The pumps can be used to generate a vacuum not use for pumping toxic or inflammable sustances. The pumps work oil-free. Prevent suction of oil mist. (KVT), overpressure (KDT) or combined (DVT)



The specification is valid up to a height of 800 m above sea level.

# Transport and storage

Store pump in a dry area. Prevent condensation caused by vapour

Lift and transport only by using the ring screws.

# Installation

walls should be no less than 10 cm of free space in order to ensure sufficient air flow for cooling. It is recommended to install the radial compres-Clearance between compressors and adjacent sor with easy access for maintenance.

# 3.60-3.80-3.100-3.140 DVT / KVT / KDT

**Operating Instructions** 

Rotary vane vacuum pumps/compressors, oilfree running, air-cooled



Contact Gebrüder Becker prior to installation Ambient temperatures must not exceed 45°C. under noise insulation canopies.

# **Connection and installation**

pipelines. Keep connections free from oil, grease, Ensure correct dimensions (see Table) and clean nes exceeding 5 m in length we recommend the water and any other contamination. With pipeliinstallation of non-return valves.

Keep connections free from oil, grease, water and other contaminants. Remove end caps at DA and SA. Do not connect to pipeline yet.

# Motor connection

observing all applicable safety regulations. Comply with Connect the radial compressor to the electricity supply EN 60204 T1.

nal box) or ready-made plugs. This work should be car-Connect motor based on connecting diagram (in termiried out by an experienced electrician only. Check for

Install motor circuit-breaker with Main switch and connecting voltage and frequency.

set to nominal motor current. (For data see motor rating plate).

Avoid switching of more than 10 times per hour.



(arrow on casing). Exchange phases if rotation is ncorrect

# Commissioning

Set vacuum control valve VR or pressure control valve DR to operating values (for values see table). Connect pressure line at DA and inlet line at SA

Gebr. Becker GmbH & Co. • Postfach 250220 • D-42238 Wuppertal • Tel. +49 202 6 97-0 • Fax +49 202 65 08 55 Service: • Tel. +49 202 6 97-171 • Fax +49 202 64 44 74 • Internet: www.becker-international.com • e-mail: info@becker-international.com

equipment against excessive pressure (for maximum values see rating plate). In case of permitted compression end pressures of more than 1 bar additionally connect a pressure meter and mark end pressure. Do not operate the compressor without safety

# Maintenance

Maintain pump regularly to achieve the best operating results. Maintenance intervals will depend on the pump's use and ambient conditions.



mains plug from socket to avoid unintentional restarting. Before commencing maintenance, remove



Air compression will generate high temperatures at the compressors: Allow the pump parts to cool before disassembly.



enclosure cover GD. Clean depending on dust accumu-The filter cartridges are inserted behind the Additional fitters are available for operation in very dusty lation. Blow out filter from inside to outside. Replace blocked, oily or greasy cartridges environment.



 $\frac{1}{2}$  T Blow out dirt in cooling air channels KK by The varies are subject to wear due to abrasion from the walls of the enclosure. compressed air.



On replacement blow out enclosure by dry compressed Check vare width every 3000 operating hours or annually (for minimum widths see Table). Remove side cover SD for this.

Replace the grease loss in the rolling bearing due to disassembly - 2g 'Amblygon 15/2' grease in total.Grease is to be found behind GB or with included grease gun.

prelubricated for life and will not require mainten-DVT/KVT/KDT3.60-3.80:The roller bearings are ance.

DVT/KVT/KDT3.100-3.140:Grease Roller bearings at A and B after 2,000 hours of operation at both of the grease nippels while the compressor is Replace by original roller bearings only running (3.100: 5g and 3.140: 7g).

Repairing Please return to Gebr. Becker.



im Sinne der EG-Maschinenrichtlinie 89/392/EWG, Anhang II A 

Gebr. Becker Gabfi & Ca. Hölker Feld 29-31 42279 Wappertal Der Hersteller

citklint hiermin, daß die Pumpe

DVT / KVT / KDT 3.60-3.80-3.100-3.140

o der vom uns gelickeiten Austührung folgenden einsching Sestimmungen entspricht :

EU: Richtilate Maschinen BM/992/EWG
 EG: Richtilate elektriveche Reerlebauitten 73/23/EWG
 EG: Richtilate elektrivetagtatekohe Verträglichkeit B9/36/EWG

Angewendete harmunistarte Normen, italvæundere: Hurarits in der aktechten Frauer

EN 1012 TJ, EN 1013 TJ, EMV EN 50081-82

Angewendete nationale icchaische Noraira, insbesondere: VBG 16

Grhi. Becker GmpH & Co. Wuppertal, den 17.05.1226

(a) March Structure Str Di Henning K Trialer

DVT / KVT / KDT 3.60-3.80-3.100-3.140 0001 05/2000

# Tabelle-Table-Tableau-Tabella-Tabla

DVT/KVT/KDT3.60
Anschlußleitung bis 2m / 2m bis 10m1" / 1 1/2"1" / 1 1/2"1 1/2" / 2"1 1/2" / 2" Pipework up to 2m / 2m up to 10m Tuyauterie jusqu'à 2m / de 2m jusqu'à 10m Tubazione fino a 2m / da 2m fino a 10m Tubo de conexión hasta 2m / de 2 a 10m
Schieber-Mindestbreite [mm]
Volumenstrom bei 50/60 Hz [m3/h]
Länge ohne Motor [mm]/Breite [mm]
Höhe [mm]
Ventilregelbereich
Schalldruckpegel [db(A]] DVT74757778 Acoustic pressure level [db(A]] Niveau de pression acoustique [db(A]] Livello di pression acustica [db(A]] Nivel de pressión acústica [db(A]]
Technische Änderungen vorbehalten Right of modifications reserved Sous réserve des modifications Sotto riserva di modificazioni Salvo modificaciones técnicas

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 $p(s_{1,2})$ 





# LIMITED WARRANTY FOR NEW PRODUCTS

The Seller (Becker Pumps Corp.) warrants to Buyer (Original Consumer, Purchaser or End User) that its products will be free from defects in materials and workmanship for one (1) year after date of purchase (See: Exception). This date of purchase shall be the actual date the product(s) was shipped from an authorized Distributor of the Seller or the Seller's own facilities to the Buyer. Formal proof of receipt may be required. It is the responsibility of the Buyer to inform the Seller's "Customer Service Department" of any problems with the operation of the products within this one (1) year warranty period and to obtain authorization prior to returning such product for warranty consideration should it be deemed necessary.

WARRANTY SERVICE CAN ONLY BE PROVIDED BY SERVICE PERSONNEL AUTHORIZED BY BECKER PUMPS CORPORATION.

All products authorized for return shall be sent with shipping charges "PREPAID" to the Seller at 100 East Ascot Lane, Cuyahoga Falls, Ohio 44223 or an approved Warranty Service Center. A Return Authorization Number shall be provided to Buyer to be placed on the outside of the package as well as on any enclosed packing list. All shipments received "Freight Collect" by Seller will be refused.

After the product is received, a detailed analysis will be made as to the nature of the problem. Should it be found that there is a defect of materials or workmanship, corrective steps will be immediately taken either to repair or replace in whole or in part the defective item(s) at no charge to the Buyer. Should the Seller determine it best to replace the whole product with a new identical product, the warranty on the new product shall be in force only to the extent of completing the warranty period of the original purchased product. The repaired or replaced product will then be returned to the Buyer freight prepaid via standard motor freight, and a credit in the same amount of the return standard motor freight charges will be issued to the Buyer as reimbursement for the incoming freight.

IF IT IS DETERMINED THAT THE PROBLEM WAS THE RESULT OF ONE OF THE FOLLOWING CAUSES:

- 1. Damage resulting from improper installation or operation in excess of nameplate specifications.
- 2. Damage from improper maintenance.
- 3. Damage from misuse, abuse, accident or alteration.
- 4. Damage from improper electrical supply and/or wiring.
- 5. Damage from excessive foreign materials (dirt, dust, metal, plastic, water, etc.) ingested by the unit.

WARRANTY WILL NOT BE HONORED and the usual charges for repair or replacement will be made, FOB the factory. NOTE: Normally wearing parts are not covered by this Becker Limited Warranty (examples would be coupling discs, vanes, oil and air filter elements, etc.).

This is the sole expressed Warranty of the Seller. No affirmations or promises of the Seller shall be deemed to create an expressed Warranty regarding a sale of Seller's products.

Exception: All new Becker U Series, Dekatorr, Pumps that have been operated from initial purchase throughout the full warranty period with Becker Vacuum Pump Oil shall be warranted for a period of two (2) years after the date of initial purchase. Proof of oil purchase may be required.

# BECKER PUMPS CORP.

100 East Ascot Lane 
Cuyahoga Falls
Ohio
44223
(330) 928-9966

# BECKER

ISO 9001 Certified (E Compliant

# **KDT** Series

# 100% OIL-LESS COMPRESSORS

The Becker KDT series is a line of 100% Oil-less, rotary vane, low pressure compressors. They are designed to operate on a continuous basis throughout a pressure range from atmospheric pressure to 22 PSIG.

Each KDT unit is a direct drive compressor and is supplied with a TEFC flange mounted electric motor. Each unit is equipped with inlet and discharge filters, a pressure regulating valve, and vibration isolators as

standard equipment, all of which are an integral part of the compressor.

The Becker KDT compressor is ideal for applications where air is the gas and where operation is in the low pressure range where high pressure compressors are less efficient. Applications for the KDT compressor include graphic arts, soil remediation, pneumatic convey-

ing, robotics and material handling, packaging, and paper converting.



Becker Pumps Corp. • 100 East Ascot Lane • Cuyahoga Falls, Ohio 44223-3768 Ph. (330) 928-9966 • (888) 633-1083 • FAX: (330) 928-7065 • e-mail: beckerpc@bright.net • www.beckerpumps.com


**TECHNICAL DATA** 











End View (Opposite Motor End)

	<u>\</u>				
	KDT 3 60	VDT 3 PO	DT 3.100	DT 3.140	
All data based on 60 Hz operation			2	2	
Flow (SCFM @ 0 PSIG)	39	48	69	95	
Horsepower	5*	7 <sup>1</sup> / <sub>2</sub> *	10*	12*	
Speed (RPM)	1740	1740	1740	1740	
Maximum Pressure (PSIG)	22	22	22	22	
Weight (lbs.)w/o motor	104	108	156	172	
Weight (lbs.)w/ motor-**	191*	265*	323*	368*	
Noise Level (Max. dBA)	74	76	78	84	
Outlet size (BSP, inches)	1	1	1 <sup>1</sup> / <sub>2</sub>	11/2	
Dimensional Data	-	(Inc	nes)		
а	12.83	12.83	15.67	15.67	
b	7.5	7,5	9.65	9.65	
b <sub>1</sub>	3.75	3.75	4.82	4.82	
е	5.43	5.43	7.5	7.5	
e <sub>i</sub>	2.56	2.56	3.75	3.75	
g	13.9	13.9	18.5	18.5	
g <sub>1</sub>	7.68	7.68	8.78	8.78	ļ
g <sub>2</sub>	5.55	5.55	9.06	9.06	
h	6.38	6.38	6.38	6.38	l
h	11.38	11.38	11.7	11.7	
h <sub>3</sub>	12.28	12.28	13.0	13.0	
h <sub>4</sub>	12.9	12.9	13.25	13.25	
i .	3.78	3.78	5.5	5.5	
k <sub>2</sub>	17.64	17.64	22.17	22.17	
k_	28.2	30	34.15	36.6	
0	1.81	1.81	2.36	2.36	

Manufacturer reserves right to alter data without notice.

\* Operation at lower pressure may use smaller motor.

\*\* May vary with motor type and manufacturer

- 1 Inlet Port
- 2 Discharge Port
- 3 Pressure Relief Valve
- 4 Vibration Isolators

3170006 - 2/0

	ソ		Replace the grease loss in the rolling bearing due to disassembly - 2g 'Amblygon 15/2' grease in total Grease is to be found behind GB or with included grease gun.	prelubricated for life and will not require mainten- ance. DVT/KVT/KDT3.100-3.140:Grease Roller bearings at A and B after 2,000 hours of operation at both of the grease nippels while the compressor is running (3.100: 5g and 3.140: 7g).	Replace by original roller bearings only. <b>Repairing</b> Please return to Gebr. Becker.	BECKER	www.prop.com. KanturnithertAfrang In Sine der EC.MachinentafinertAfrang Der Menselen Gahr Becker Gabil & C.	Rither Ford 20,51 ALTP Weighertal actual Mamile of Pumper DVT / KVT 3,629-3,60-3,140 DVT / KVT 3,629-3,60-3,140 is duryon unsuger Bedimanuger activities in	<ul> <li>E.C. Blanker Antachness Phys. Rev. D (2014).</li> <li>E.C. Blankinke charter and an analysis of the state of the state</li></ul>	Merroration 1910, 194
Operating Instructions	npressors,		Do not operate the compressor without safety equipment against excessive pressure (for maxi- mum values see rating plate). In case of permit- ted compression end pressures of more than 1 bar additionally connect a pressure meter and mark end pressure.	Maintenance Maintain pump regularly to achieve the best ope- rating results. Maintenance intervals will depend	on the pump's use and ambient conditions.		Air compression will generate high temperatures at the compressors: Allow the pump parts to cool before disassembly.	The filter cartridges are inserted behind the enclosure cover GD. Clean depending on dust accumu- tation. Blow out fitter from inside to outside. Replace blocked, oily or greasy cartridges. Additional filters are available for operation in very dusty Additional filters are available for operation in very dusty	Amount of the second and the second of the second and the second and the second and the second and the second seco	Check vane width every 3000 operating hours or amually flor minimum widths see Table). Remove side cover SD for this. On replacement blow out enclosure by dry compressed alr.
DVT / KVT / KDT 3.60-3.80-3.100-3.140	Rotary vane vacuum pumps/cor oilfree running, air-cooled		Contact Gabridder Becker prior to installation under noise insulation canoples. Ambient temperatures must not exceed 45°C. <b>Connection and installation</b>	Ensure correct dimensions (see Table) and clean pipelines. Keep connections free from oil, grease, water and any other contamination. With pipellnes exceeding 5 m in length we recommend the installation of non-return valves.	Keep connections free from oil, grease, water and other contaminants. Remove end caps at DA and SA. Do not connect		Motor connection Connect the radial compressor to the electricity supply observing all applicable safety regulations. Comply with EN 60204 T1.	Connect motor based on connecting diagram (In termi- ral box) or ready-made plugs. This work should be car- ried out by an experienced electrician only. Check for connecting voltage and frequency. Install motor circuit-breaker with Main switch and set to nominal motor circuit-breaker with Main switch and set to nominal motor circuit-	Avoid switching of more than 10 times per hour. Avoid switching of more than 10 times per hour. Briefly start motor and check rotation (arrow on casing). Exchange phases if rotation is incorrect.	<b>Commissioning</b> Correct pressure line at DA and inlet line at SA. Correct pressure line at DA and inlet line at SA. Set vacuum control values (for values see table). DR to operating values (for values see table).
<b>BECKER</b>	Vacuum pumps • Compressors	Application	These operating Instructions apply to: -Pressure vacuum pumps DVT 3.60-3.140 -Vacuum pumps KVT 3.60, 3.80, 3.100, 3.140 -Compressors KDT 3.60, 3.80, 3.100, 3.140	Please comply with Accident Preventi- on Regulations VBG 16, Compressors, in particu-	lar Section Illc *Installation" and IV *Operation" plus VBG 4 *Bectrical equipment and tools". Pumps may only be converted or modified after approval by the manufacturer.	Application	The pumps can be used to generate a vacuum (KVT), overpressure (KDT) or combined (DVT). Inlet air must be standard dry atmospheric air. Do not use for purrping toxic or inflammable sustances. The pumps work oll-free. Prevent suction of oil mist.	The specification is valid up to a height of 800 m above sea level.	Transport and storage Store pump in a dry area. Prevent condensation caused by vapour. Lift and transport only by using the ring screws.	It is recommended to install the radial compres- sor with easy access for maintenance. Learance between compressors and adjacent walls should be no less than 10 cm of free space in order to ensure sufficient air flow for cooling.

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DVT/KVT/KDT3.603.803.1003.140
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Volumenstrom bel 50/60 Hz [m3/h]55/6670/8298/112132/154 Air flow at 50/60 Hz [m3/h] Déblt d'air à 50/60 Hz [m3/h] Capacità aria a 50/60 Hz [m3/h] Caudal volumétrico de aire con 50/60 Hz [m3/h]
Långe ohne Motor [mm]/Breite [mm]448/353448/353563/470563/470 Length without motor [mm]/Width [mm] Longeur sans moteur [mm]/Largeur [mm] Lunghezza senza motore [mm]/Larghezza [mm] Longitud sin motor [mm]/Ancho [mm]
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Technische Änderungen vorbehalten Right of modifications reserved Sous réserve des modifications Sotto riserva di modificazioni

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Saivo modificaciones técnicas







Baureihe/series/série/serie

DVT 3.60-3.80, KDT 3.60-3.80

Vakuumpumpen • Verdichter Vacuum pumps • Compressors Pompes à vide • Compresseurs Pompe per vuoto • Compressori Ersatzteilliste Spare parts list Liste de pièces de rechange Listino pezzi di ricambio



# DVT 3.60-3.80, KDT 3.60-3.80

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KEY CONNECTION FLANGE SPRING DISC SOCKET HEAD SCREW COUPLING WASHER WASHER DIAVE SHAFT ELTER HOUSING GASKET HEXNUT WASHER SILENCER SPRING DISC SOCKET HEAD SCREW RDECKEL GASKET ASKET HANDLE COOLER GASKET GASKET GASKET GASKET SOCKET HEAD SCREW GASKET GASKET FILTER HOLDER SOCKET HEAD SCREW BEARING BEARING SET DISTANCE DISC RING COMPENSATING DISC SHAFT SEALING RING HEX HEAD SCREW HEX HEAD SCREW HEX HEAD SCREW STRAIGHT PIN STUD SILENCER SILENCER FILTER CARTRIDGE FILTER CARTRIDGE SILENCER SILENCER BLIND RIVER FILTER COVER STUD WASHER HEX.NUT LOCATING PEG GASKET COOLER COOLER CATRUGE Beschreibung BEARING COVER BEARING COVER PUMP BODY GASKET ROTOR /ANES STUD

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#### Checking Vane Wear in Becker Compressors

Becker<sup>®</sup> Pumps Corporation recommends checking the vane wear at 3,000-hour intervals based on "normal" installations. "Normal" basically means that the compressor is protected from rain, high humidity, temperature extremes, dust, etc. Typically, however, remediation systems have Becker compressors located outside in the weather and subject to all types of adverse operating conditions. Therefore, Becker recommends that a weather shield be installed above the compressor and that the vanes be checked on monthly (or 1000-hour) intervals. Moisture entering the compressor (even though an air intake filter is used) carries particulates into the vane/rotor chamber. Since the vanes are made of carbon, and are very brittle, even small amounts of particulates will cause rapid vane wear. Checking vane wear will allow the consultant to determine wear rate and estimate when vane replacement will be required. Each Becker model has a minimum vane thickness specification. If the vane is allowed to wear below minimum, then vane breakage will occur and entails a time consuming and costly repair. Checking the vanes is only a 15- to 30-minute procedure and requires simple hand tools.

#### Vane Inspection Procedure

First, shut off power to the compressor and close all process piping valves at the air sparge manifold. Release any pressure from the compressor. Pressurized air in the sparge points will try to return through the compressor. Lock out/Tag out the electrical power to the compressor motor. Allow the compressor to cool for a few minutes. Using a 5mm or 6mm hex key (depends on the compressor model), remove the plastic end housing of the compressor to expose the compressor endplate.



Using a 10mm socket, remove the bolts holding the endplate to the rotor chamber body (See picture, left). Now thread two of the 10mm bolts into the 2 threaded holes in the endplate. Alternately tighten the two bolts to "pull" the endplate free from the rotor chamber (See picture, right). Now the vanes (4 or 5 depending on model) are accessible.





Make note of the vane's beveled edge orientation. Remove each vane and visually inspect for cracks and chips. Use a metric ruler to measure the width of each vane and compare with factory specifications (See picture, left). If the vanes are below the manufactures minimum specs replace them with new ones. Reusing worn out or damaged vanes could result in vane breakage (See picture, right).



See Checking Compressor Vanes, Continued, on Page 3

#### Checking Compressor Vanes, Continued

Before reassembling the compressor, inspect the rotor shaft bearing located in the end housing. Make sure that it isn't scored, pitted, or contaminated with dirt. Also inspect the machined surfaces of the rotor chamber and end housing for debris and rust. Minor rust can be removed with fine grit sandpaper (don't forget to clean out any residue). Reassemble the compressor in the reverse order of disassembly.

Check that the vanes move freely in the slots in the rotor (See picture, below left). Any binding will prevent proper operation. Here's a hint: a wooden yard stick is the perfect size to "rod out" the vane slots. Another good idea is to put anti-seize lubricant on all bolt threads; that will make future disassembly much easier. Lubricate the front and rear bearings using the Becker grease gun and lubricant. Inspect and clean all the air intake filters. It is also a good idea to visually check the electric motor to compressor coupling (the "lovejoy" coupling) for abnormal wear (See picture, below right). Now the Becker can be put back into service.



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#### Helpful Links:

Becker Pumps Corporation: http://www.beckerpumps.com/

This article is part of a series written by Broward County's Remediation System Inspector, Mr. Stirling Gosa. If you have any questions, please feel free to email Mr. Gosa at sgosa@broward.org.

#### **Feedback Forum**

In order to improve the services which the EAR Section provides and better understand your needs, we need your feedback! Do you have a suggestion for the *Times*? Are there areas in which the Section can serve you better? Any comments may be sent via US Mail or fax to:

Broward County DPEP/PPRD ATTN: Lorenzo Fernandez, P.E. 218 S.W. 1" Avenue Fort Lauderdale, FL 33301 Fax: (954) 765-4804 You may also contact Mr. Fernandez via email at <u>lfernandez@broward.org</u> or by telephone at (954) 519-1249.

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# DVT/KVT/KDT 3.000 REPAIR & SERVICE MANUAL





100 East Ascot Lane • Cuyahoga Falls, OH 44223 Tel: 330-928-9966 • Fax: 330-928-7065

# DVT, KVT, KDT 3.000 REPAIR & SERVICE MANUAL

This manual is intended to be used in conjunction with the current parts list for the appropriate model. Reference numbers used in this manual are position numbers shown on the parts list. The sealing compounds and greases referred to in this manual are the sealants and greases recommended by the pump manufacture. These are available through your Becker Pump Distributor.

#### DVT/KVT/KDT 3.000 REPAIR & SERVICE MANUAL

PAGE 1

# Disassembly

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- 1. Remove the 4 bolts (#188) from the motor flange (#182) and remove the motor and flange.
- 2. Remove the coupling disc. (#196)
- 3. Remove the shaft end screw from the rotor shaft. (#58)
- 4. Remove the coupling with fan (#56) and shaft key. (#47)
- 5. Remove the 4 socket head cap screws (#171) and protective hood (#161).
- 6. Loosen and remove the 3 socket head cap screws (#188) with spring washers from the connection flange (#50) and remove flange.
- 7 Remove the filter cover and remove the filter cartridges. (#68 and #69)
- 8. Remove the ring bolt. (#178)
- 9. Remove the 4 SHCS (#170) and remove air guide cover (#163)
- 10. Remove valves (#285 and 281 or 341 and 345)
- 11. Roll pump housing onto filter cover gasket surface.
- 12. Remove SHCS (#173) and rubber foot. (#175)
- 13. Remove canopy. (protective hood #161)
- 14. Remove 6 SHCS (#105) and cover (#103).
- 15. Remove dust separator (#91).

#### 16. DVT/KVT/KDT 3.80:

- Remove 2 SHCS (#79) and filter holder (#77).
- Remove 4 SHCS (#131) and 4 SHCS (#129) to separate cooler (#121) from cover (#134) and filter housing (#61).
- Separate after cooler (#88) from filter housing. (DVT/KDT only)
- Remove 3 SHCS (#130) and cover (#134).
- Remove 4 SHCS (#198) and filter housing (#61).

#### DVT/KVT/KDT 3.100 & 3.140:

- Remove 6 SHCS (#138) and 4 SHCS holding filter housing (#161) to pump body(#5)
- Separate after cooler (#88) from filter housing. (DVT/KDT only)
- Roll unit on to inlet port and remove 4 SHCS (#132) and remove cooler assembly (#123&121).
- 17. Remove 6 bolts (#41) from B-side endshield (#14/16). Screw 2 bolts in to threaded holes in endshield and tighten to pull endshield off locating pins.
- 18. Remove vanes (#11).
- 19. Remove 6 bolts (#41) from A-side endshield (#13/15). Screw 2 bolts in to threaded holes in endshield and tighten to pull endshield off locating pins. Remove A-side endshield and rotor assembly from housing.
- 20. Press rotor out of A-side endshield.

The unit is now completely disassembled. Thoroughly clean the unit in a suitable solvent, discarding gaskets, filters, and dust separator. After cleaning in solvent, degrease rotor, end shields, and cylinder with contact cleaner and blow dry with compressed air to remove all traces of solvent and grease.

#### DVT/KVT/KDT 3.000 REPAIR & SERVICE MANUAL

PAGE 2

# Inspection

- 1. Inspect cylinder for chatter marks or scoring.
- Inspect side shields. If heavily scored, replace.
   Note: Anytime a major component ( end shield, rotor, or cylinder housing) is replaced, the rotor to cylinder clearance must be reset.
- 3. Inspect rotor for damage.

### Reassembly

#### 1. Replacement of A side bearing

- Remove the 3 internal hex head screws from bearing cap and remove cap. (# 42&18)
- Remove bearing, shaft seal (if unit is equipped with seal on A-side) and teflon tube seals. (#28,26&24)
- If unit does not have sealed bearings, fill new bearing with Amblygon TA15/2 grease.
- Install new shaft seal and teflon tube seals.
- Place bearing in seat in end shield and replace bearing cap, be sure to evenly tighten screws.

#### 2. Replacement of B side bearing

- Remove the 3 internal hex head screws from bearing cap and remove cap. (#42&19)
- Remove bearing outer race with rollers and cage, shaft seal, and teflon tube seals. (#28,26, &24)
- Install new shaft seal and teflon tube seals.
- Fill new roller bearing half full with Amblygon grease and place in bearing seat in end shield.
- Replace bearing cap and be sure to evenly tighten internal hex head screws.
- Remove bearing retaining clip (#36).
- Remove bearing inner race from rotor end and replace with new race.
- Replace bearing retaining clip (#36).

PAGE 3

## Setting rotor to A side endshield clearance

1. With new bearings and shaft seals in A side endshield, place shim stack of 0.15mm to 0.20mm on A side of rotor shaft. Press endshield onto shaft and measure clearance between endshield and rotor. See table 2 for proper clearances. Add or subtract shims to obtain proper clearance.

# Setting rotor to cylinder clearance

The following steps 1-18 are only required if a major component of the pump has been replaced. (endshield, rotor, or pump housing.)

- 1. Place housing on work bench so that the minimum clearance area (the area of minimum rotor to cylinder clearance when the pump is fully assembled) is positioned at the bottom.
- 2. Remove locating pegs (#17) from both endshields. Mark endshields for suitable location of new holes for locating pegs.
- 3. Set rotor to endshield clearance using new bearings and shaft seals.
- 4. Insert gauge tape (feeler gauge, shim stock, paper, or non reinforced tape) of proper thickness, and approximately the same width as a rotor segment between two vane slots), into the cylinder. Make sure the rotor is supported by a single thickness of gauge tape above the cylinder.
- 5. Place rotor and A side endshield into housing making sure that rotor segment, not a vane slot, is resting on the gauge tape.
- 6. Install A side endshield bolts but do not fully tighten.
- 7. Install B side endshield bolts but do not fully tighten
- 8. Using moderate pressure, press down on endshield and center endshield bolts in holes, tighten bolts.
- 9. On 4.5mm drill bit mark drilling depth using peg as guide.
- 10. Drill holes in endshield to proper depth, taking care to keep drill perpendicular to endshield.
- 11. Repeat on opposite end.
- 12. Remove endshields and redrill holes in body with 4.9mm drill bit.
- 13. Using 5mm H7 reamer ream holes in endshields.
- 14. Ream holes in body using 5mm carbide reamer.
- 15. Install locating pegs in endshields and remove gauge tape from rotor and cylinder.
- 16. Reinstall A side endshield and rotor.
- 17. Install vanes and B side endshield.
- 18. Rotor to cylinder clearance is now reset, continue reassembling unit in normal manner.

# Reassembly

- 1. Reinstall filter housing (#61) and after cooler (DVTs & KDTs only) with new gaskets.
- Stand assembly on B-side endshield and install cooler (#121 on 3.80s or 123&121 on 3.100 and 3.140) with new gaskets.
- 3. On 3.80 replace cover (#134) and filter holder (#77) for dust separator.
- 4. With assembly still standing on B-side endshield reinstall connection flange (#50)

#### DVT/KVT/KDT 3.000 REPAIR & SERVICE MANUAL

PAGE 4

# **Reassembly continued**

- 5. Reinstall shaft key (#47) and fan with coupling (#56)
- 6. Replace shaft end bolt and washer and fully tighten.
- 7. Replace cooler cover (#166 protective hood).
- 8. Replace protective hood (#161), foot (#175) and ring screw (#178&#132).
- 9. Install motor mounting flange (#182)
- 10. Check motor coupling distance and install new coupling disc.
- 11. Mount motor to pump; wire for correct voltage and rotation.
- 12. Test unit for 1 hour before installation.

# Setting motor coupling distance

- 1. Place straight edge across the machined surface of the motor connection flange (# 50) and measure to the outer ring of the pump coupling. (#56)
- 2. Subtract 2mm (.080") from measurement obtained in step 1.
- 3. Place straight edge across motor coupling (#195) and push coupling on to motor shaft far enough to obtain the distance calculated in step 2 from outer ring of coupling to mating surface of motor adaptor ring. (#182)
- 4. Apply blue lock tite (Lock Tite # 242) to motor coupling set screw and tighten.
- 5. Attach motor to pump.

# Unit testing

- 1. Check that motor is wired for correct voltage and frequency. Check motor for correct direction of rotation.
- 2. Operate pump under no load for approximately 20 minutes.
- 3. Place vacuum gauge and ball or gate valve on inlet port (on combined units also install pressure gauge and valve on discharge port). Adjust pump relief valves so that pump can not exceed rated vacuum and pressure. Check motor amperage. As unit warms up, amps will go down and vacuum and pressure may go up, so it may be necessary to reset valves.

4. When everything is operating properly continue test for 60 minutes.

# **Trouble Shooting**

Problem	Possible Cause	Solution	
Unit lacks sufficient vacuum or compressed air.	Clogged filters	Clean or change filters; add a higher capacity external filter in series with the existing internal filters.	
	Stuck rotor vanes.	Disassemble unit and clean all oil traces from internal parts.	
		Replace carbon vanes, since they become hygroscopic when exposed to oil.	
		Chect for oil contamination in the suction line.	
	Pressure or vacuum relief valves need adjusting.	Recalibrate valves.	
	Leaks or restrictions in piping.	Open pipe connections and examine for internal contamination or buildup.	
		Tighten all piping connections.	
		Replace rubber hoses.	
	Insufficient pump speed (RPM).	Check voltage and amperage to motor.	
		Inspect motor and coupling halves.	
		Check that the pump shaft turns freely.	
	Clogged Ports.	Clean and open all ports.	
	Defective gaskets.	Inspect gaskets for breakage or disintegration. Replace if necessary.	Ð

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Problem	Possible Cause	Solution
Unit lacks sufficient vacuum or compressed air (cont.).	Line losses too high.	Piping diameter too small—replace with larger diameter.
		replace if necessary.
	Carbon dust separator clogged.	Inspect, clean, or replace.
	Unit is operating at an elevated altitude.	Contact the factory for assistance. Performance may be reduced when operating above sea level.
Motor breakers trip	Defective motor.	Test motor and replace if necessary.
	Undersized circuit breaker.	Replace with correctly sized breaker.
	Heaters too small.	Replace with correctly sized heaters.
	Low motor voltage.	Check at motor terminals. Contact electric service provider.
	Ambient temperature too high.	Reduce ambient temperature to below 104°F.
	Stuck rotor.	Disassemble pump to determine reason. Replace all necessary parts.
	Clogged carbon dust separator— back pressure too high.	Clean or replace dust separator.
Unit runs rough and cannot be rotated manually	Broken rotor vane.	Disassemble unit and replace vane. Check cylinder for wear.
	Worn coupling disc.	Remove motor and inspect rubber coupling disc and pins. Replace, if necessary, and realign.
	Siezed bearings.	Remove end shields and inspect bearings. Replace if necessary. Reshim bearings to maintain proper clearance.

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Problem	Possible Cause	Solution
Unit runs rough and cannot be rotated manually (cont.).	Oil in the cylinder.	Remove end shields and inspect cylinder. Clean oil and replace vanes.
	· · ·	Clean unit thoroughly.
		Inspect piping; determine source o oil and eliminate.
	Locked rotor.	Remove end shields and inspect cylinder. Remove contamination.
Pump overheats.	Cooling ducts blocked.	Clean cooling ducts.
	Cooling fan broken.	Replace fan.
	•	

# **Repair Tolerances**

Pump Type	Rotor Length	Cylinder Length	Cylinder Inside Dia.
DVT 3.80	169.685 - 169.710	169.975 - 170.000	118.000 - 118.035
DVT 3.100	249.571 - 249.600	249.971 - 250.000	118.000 - 118.035
DVT 3.140	239.571 - 239.600	239.971 - 240.000	142.000 - 142.040
KVT/KDT 3.80	169.655 - 169.680	169.975 - 170.000	118.000 - 118.035
KVT/KDT 3.100	249.541 - 249.570	249.971 - 250.000	118.000 - 118.035
KVT/KDT 3.140	239.541 - 239.570	239.971 - 240.000	142.000 - 142.040

Fump Type	(D)	(E)	End Shield (C)	Cylinder
DVT 3.80 1 DVT 3.100 2 DVT 3.140 2 KVT/KDT 3.80 1 KVT/KDT 3.100 2 KVT/KDT 3.140 2	69.75 - 169.78 49.61 - 249.65 39.66 - 239.70 69.75 - 169.78 49.61 - 249.65 239.66 - 239.70	Min. New 27.0 - 39.0 27.0 - 39.0 32.0 - 49.0 27.0 - 39.0 27.0 - 39.0 32.0 - 49.0	0.04 - 0.07 0.04 - 0.07 0.05 - 0.08 0.04 - 0.07 0.04 - 0.07 0.05 - 0.08	0.09 - 0.11 0.09 - 0.11 0.09 - 0.11 0.09 - 0.11 0.09 - 0.11 0.09 - 0.11





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100 East Ascot Lane • Cuyahoga Falls, OH 44223 Tel: 330-928-9966 • Fax: 330-928-7065



Thermal Transfer Products 5215 21st Street, Racine, Wisconsin 53406-5024 Phone (262) 554-8330 Fax (262) 554-8536

#### INSTALLATION AND SERVICE RECOMMENDATIONS AIR COOLED COMPRESSED AIR AFTERCOOLERS AA-35 THRU AA-300 UPA-20 THRU UPA-100

#### General Information

- 1. Air cooled aftercoolers are built for operation with maximum air pressure of 250 psi, and temperature of 350°F.
- 2. The motors furnished are built for fan duty. Consideration should be given to the installation location so motors are not subjected to extreme temperatures.
- 3. Air cooled aftercoolers are generally installed at floor level. If the unit is to be used to reclaim waste heat for space heating, it is recommended that the unit be mounted 7 to 14 feet above the floor, depending on the structure, for proper heat distribution.

#### Installation

- 1. Air cooled aftercoolers are designed for mounting either by mounting legs, or by suspension from brackets attached to the cabinet. (Hanger rod not included).
- 2. Aftercoolers should not be located in corrosive atmospheres as rapid deterioration of casing, cooling coil, fan and motor may take place resulting in reduced life.
- 3. Piping should be sized based on air flow and pressure drop requirements and not on the aftercooler's supply and return connection sizes. The piping must also be properly supported to prevent manifold stress.
- 4. A strainer located ahead of the aftercooler should be installed to trap scale, dirt or sludge that may be present in piping and equipment, or that may accumulate with use.
- 5. A separator/trap/drain should be installed in the outlet piping of the aftercooler to remove condensate.
- Elexible connectors should be installed to prevent the stressing of manifolds. (Must be properly installed to validate warranty.)
- 7 Arrange the outlet pipe so that the moisture that condenses within the aftercooler can drain freely by gravity.
- For proper air flow, a minimum of 12" clearance should be allowed between the aftercooler fan and any walls or obstructions.

#### INSTALLATION AND SERVICE RECOMMENDATIONS AIR COOLED COMPRESSED AIR AFTERCOOLERS CONTINUED

#### Electrical

- 1. Caution: To prevent possible electrical shock, it is important to properly ground this unit using grounding screw provided. Be sure not to disconnect the motor grounding wire when making this connection.
- 2. Connect motor only to a power supply of the same characteristics as shown on the motor nameplate. Be sure to provide proper fusing to prevent motor burnout. Before starting motor, follow manufacturer's recommendations. Turn fan manually to eliminate possible motor burnout in the event the fan has been camaged in shipment. Observe operation after motor is started for the tirst tame.
- 3. In a typical compressor aftercooler installation, the aftercooler is interlocked to the compressor so it runs whenever the compressor is turned on.

#### Maintenance

- 1. Inspect the unit regularly for loose bolts and connections, rust, corrosion, and dirty or clogged heat transfer surface (cooling coil).
- P. Heat Transfer Surface: Dirt and dust should be removed by brushing the fins and tubes and blowing loose dirt off with an air hose. Should the surface be greasy, the motor should be removed and the fins and tubes brushed or sprayed with a non-flammable degreasing fluid. Follow with a hot water rinse and dry thoroughly. A steam hose may also be used effectively.
- 3. Casing, Fan and Motor: Dirt and grease should be removed from these parts. Rusty or corroded surfaces should be sanded clean and repainted.
- 4 Internal Cleaning: Once a year piping should be disconnected and a degreasing agent circulated through the unit to remove sludge from internal tube surfaces to return the unit to full papaeity. A thorough pleaning of the entire system in the same manner is desirable to avoid parry-over from uncleaned piping. The strainer or any filtering devices should be removed and serviced following this cleaning operation.
- 5 Motor: keep outside aurtable tree of dirt and grease so motor will dool properly. Make sure cound air over motor a pot costructed. Sleeve bearing motors are normally turnished and require lubrication every six motions. Add it tew arops of SLA E. 20 oil to each bearing. When TEFO Motors are turnished, they are normally prelubricated call bearing motors and require no greace for about tive to ten years.
- Bepairs or Replacement of Parts: When ordering replacement parts or making an inquiry regarding service, mention model number, serial number and the original purchase order number. Any reference to the motor must carry full nameplate data.
  - auglic cleaners photod but the unset to clean these heat exchangers.





#### PRODUCT WARRANTY

Thermal Transfer Products warrants its products to be free of any defects in workmanship or materials under what is considered to be normal service for 12 months from the date of manufacture from our plant in Racine, Wisconsin USA.

All obligations and liactifities are limited to the repair or replacement of the defective part at our option. Thermal Transfer Products accepts no liability for consequential damage or reinstallation labor.

Any accessories or components furnished by other manufacturers shall be subject to the manufacturer's particular warranty.

Thermal Transfer Products reserves the right to revise or improve any products with no obligation to incorporate these changes in any products manufactured prior to such revisions or improvements. The company will not assume responsibility for contingent liability through any alleged failure or failure of any of its products or accessories.

This 12-month warranty does not apply to failures, which result from:

- Over-pressurization,
- Improper application,
- Improper installation or mounting design, which permits excessive vibration and causes failure or breakage of parts due to material fatigue or deterioration.
- Damages as a result of freezing.
- Shipping damage.
- Failure due to corrosion or damage from storage in corrosive atmospheric conditions.
- · Earlier to to any the factory provided installation and service instructions.

To obtain warranty approval, the customer must first obtain a Return Goods Authorization (RGA) number trouble. Thermal Transfer Products distributor through whom the product was originally purchased.

All units must be held for inspection by a factory representative or at the discretion of the Thermal Transfer Product, Service Deptheturned to the factory for evaluation. (See the Warranty Return Policy for further detailed

#### DNALTHORIZED LIELD SERVICE

If a basic recursion and to reed field betwee on a product or its accessory, the buyer shall be responsible for all manual reconsectation determined therein. This includes charges for freight, labor and service, together with any other expension inclused.

# **Solenoid Valve**

#### DESCRIPTION:

2-way, internally piloted, normally closed, solenoid valve with assisted lift

PIPE SIZE:	1/4" - 1"
COILS:	

BDU - 8W 310°F (Class F)	
DA - 8W 310°F (Class F)	
ADF - 8W 360°F (Class H)	
UDA -12W 310°F (Class F)	
DH -12W 360°F (Class H)	
GH -14W 360°F (Class H)	

GRANZOW.



Sealing Material	Tempera	ature	Medium	
Y = NBR + PA (polyamide)	14ºF	195°F	Air, Inert gas, Water	

	Dino		Orifico	Cv	Power	Operating Pressu		Operati	essure
	Size	Model	Sizo	Flow	(watt)	Min	M.O.	P.D.	
	OIZe		5126	Factor	(wait)	psi AC psi		DC psi	
					8			75	
	1/4"	21HN2KY110	7/16"	1.4	12			200	
					14			200	
					8		Į	75	
	3/8"	21HN3KY110	7/16" 5/8"	/16" 1.4 5/8" 2.8	12	0	200	200	
					14			200	
ſ					8			35	
	1/2" 21HN	21HN4KY160			12			160	
					14			200	
Γ					8			35	
	3/4"	21HN5KY160	5/8"	2.8	12	-		160	
					14			200	
		21HN6KY250			8		116	-	
ン	> 1"		1"	8.3	12		200	22	
					14		200	85	

# **21HN**

# **Solenoid Valve**





MATERIALS OF CONSTRUCTION
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Body Armature Tube	Brass Stainless Steel 300
Annature Tube	Stanness Steel 500
Fixed Core	Stainless Steel 400
Plunger	Stainless Steel 400
Spring	Stainless Steel 300
Shading Ring	Copper
Orifice	Brass

ELECTRICAL CONNECTION:

Rating:	NEMA 4
Strain relief connector:	Model 009
1/2" conduit connector:	Model 010
6 ft. power cord:	Model GRN100





SPARE PARTS:						
Coils:	see other s	side				
Kit:	1/4" – 3/8"	KTGHT3KOY11				
	1/2" – 3/4"	KTGHT4KOY16				
	1"	KTGHT6KOY25				

COIL SPECIFICATIONS:						
Watt	Inrush VA	Holding VA				
8	25	14.5				
12	36	23				
14	43	27				

VALVE DIMENSIONS							
MODEL	Α	В	С				
21HN2KY110		3-1/2	2-7/32				
21HN3KY110	1.31/32	5-172	2-1152				
21HN4KY160	1-51/52	3 15/16	2.3/1				
21HN5KY160		5-15/10	2-5/4				
21HN6KY250	2-9/16	4-13/32	4-3/32				

COIL DIMENSIONS							
WATT D E F							
8 1-3/16		1-21/32	2-1/8				
12	1-7/16	1-29/32	2-3/8				
14	2-1/16	2-7/32	2-21/32				

Dimensions in inches





2300 CrownPoint Executive Drive Charlotte, NC 28227 Phone 704-845-2300 FAX 704-845-2301

#### www.granzow.com

#### INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS SOLENOID VALVES

The manufacturer warrants the equipment manufactured by it to be free from defects in materials or workmanship for a period of ninety (90) days from the date of shipment to buyer. If the equipment or any part thereof becomes defective within ninety (90) days from such date, the defective equipment will be replaced or credit allowed therefore at the sole option of manufacturer, but without credit or payment for any labor.

The foregoing is the exclusive remedy of any buyer of manufacturer's equipment. The maximum damages liability of the manufacturer is the cost of replacement of the equipment or part.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER WRITTEN, ORAL OR STATUTORY, AND IS EXPRESSLY IN LIEU OF THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. THE MANUFACTURER SHALL NOT BE LIABLE FOR LOSS OR DAMAGE BY REASON OF STRICT LIABILITY IN TORT OF ITS NEGLIGENCE IN WHATEVER MANNER INCLUDING DESIGN, MANUFACTURE OR INSPECTION OF THE EQUIPMENT OR ITS FAILURE TO DISCOVER, REPORT, REPAIR OR MODIFY LATENT DEFECTS INHERENT THEREIN.

THE MANUFACTURER, HIS REPRESENTATIVE OR DISTRIBUTOR SHALL NOT BE LIABLE FOR LOSS OR USE OF THE EQUIPMENT OR OTHER INCIDENTAL OR CONSEQUENTIAL COSTS, EXPENSES OR DAMAGES INCURRED BY THE BUYER, WHETHER ARISING FROM BREACH OF WARRANTY, NEGLIGENCE OR STRICT LIABILITY IN TORT.

The manufacturer does not warrant any equipment, part, material

component, or accessory manufactured by others and sold or supplied in connection with the sale of manufacturers products.

#### CAUTION

#### 1. PRESSURIZED DEVICES

This equipment is a pressure containing device

-Do not exceed maximum operating pressure.

-Make sure equipment is depressurized before working on or disassembling it for service.

2. ELECTRICAL

This equipment requires electricity to operate.

-Install equipment in compliance with national and local electrical codes.

-Standard equipment is supplied with NEMA 4 electrical enclosures and is not intended for installation in hazardous environments.

-DISCONNECT POWER SUPPLY TO EQUIPMENT WIHEN PERFORMING ANY ELECTRICAL SERVICE WORK. A. INSTAILATION

a.1 Before mounting the valve it is essential to check that the solenoid valve model, the voltage (Volt) and the frequency (Hz) correspond to the characteristics required. **B. MECHANICAL PART** 

b.1 Assembly of the solenoid valve must correspond with the flow directions indicated with an arrow on the valve body.

b.2 If the valves are provided with caps for protecting the connections, make sure they are removed before assembly.

b.3 Care should be taken to prevent foreign bodies from entering the valve during the assembly phase, e.g. material chips, dirt or particles of insulating material such as the PTFE tape from the "external thread" connections.

b.4 Although the valve can be used in any position, the inverted position is not advised since possible impurities could become blocked inside the core tube causing malfunctioning.

b.5 When installing the valve make sure that the position and surrounding space are sufficient to allow for possible future maintenance or replacement of the coil.

b.6 Never use a part of the core tube or the coil itself as a lever during the tightening phase: this could cause irreparable damage to the valve.

b.7 In those installations where impurities, slag or deposits of various types may infiltrate the fluid, it is advisable to mount a filter upstream the valve.

b.8 In case of solenoid valves with holes drilled for supports, use must be made exclusively of these without modifying the holes or anything else on the valve body.

b.9 For solenoid valves with connections to be welded, please refer to paragraph d.4. C. ELECTRICAL CONNECTIONS

c.1 Before connecting the coil to the supply system, make sure that the charactenistics conform to the supply voltage.

c.2 Each coil features two terminals located opposite each other and a ground terminal. The terminals opposite each other are used for energizing the coil and are not polarized. If a plug-in connector is provided the terminals on the connector are marked 1 and 2. c.3 Where applicable the ground terminal must be connected.

c.4 The coil should not be energized before being installed on the valve since this could cause it to burn out.

c.5 Rotate the coil to the most suitable position, loosening and subsequently tightening the upper nut.

c.6 If the valve body should be subject to condensation or defrosting it is advisable to add a moistureproof 0 Ring as illustrated in our catalogue.

D. WORKING TEMPERATURE

d.1 It is normal for the coil temperature to increase during operation; irregular overheating will cause smoke and a smell of burning. In this case the supply must be immediately isolated.

d.2 Care should be taken not to install the valve near to sources of heat or in environments where there could be a dissipation of the heat produced by the coil.
d.3 For special conditions, e.g. high temperatures or particular safety regulations, please consult our catalogue or our Technical Office.

d.4 Particular attention should be paid to the temperatures when installing valves with connections welded.

d.5 When carrying out welding between the valve connection and the pipe of the system, it is necessary to dismantle the coil and check that the temperature of the valve body does not exceed values of 100 -150°C (200-300° F). The flame should be regulated so that it does not come into contact with the valve. The body of the latter should be cooled by wrapping it in wet cloth. Should it be impossible to carry out these precautions, we suggest dismantling the parts inside the valve.

E. MAINTENANCE

e.1 After disconnecting the supply voltage and discharging the pressure carry out inspection of the valve.

e.2 Clean and inspect all the internal parts and replace them if necessary.

e.3 Remount all the parts making up the solenoid valve with care, paying great attention to the correct position of each part and protecting the sealing surfaces.

e.4 Check for tightness and correct operation.

#### 2C634B, 2C708C, 2C710C 2C713B, and 2C819B

**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<sup>®</sup> Utility Shutter-Mounted Exhaust Fans

#### Description

Dayton utility exhaust fans are designed for exhaust applications in stores, offices, factories, shops, farm buildings, greenhouses, etc. Efficient, easy-to-install exhaust fans with automatic shutters. Model 2C634, 7" Shutter fan fits in half of an 8 x 16" concrete block. Shutter flanges have eight pre-punched 1/4 x 1/2" slotted mounting holes for ease of installation. 7 to 18" diameter deep pitched propeller. Fan guards have charcoal grey metallic polyester finish to resist corrosion. Wire guards comply with OSHA Federal 1/2" max. opening requirement. Totally enclosed, sleeve bearing 115V, 60 Hz motors. Shipped completely assembled. **Optional Accessory:** Speed controller for up to 3 amps, Part No. 4YC44.

#### Unpacking

- 1. Inspect for any damage that may have occurred during transit.
- Shipping damage claim must be filed with carrier.
- Check all bolts, screws, setscrews, etc. for looseness that may have occurred during transit. Retighten as required.
- Before installing, rotate the propeller to be sure there are no obstructions which would interfere with proper operation. Adjust as required.

General Safety Information AWARNING Do not depend on any switch as sole means of disconnecting power when installing or servicing the fan. If the power disconnect is out-of-sight, lock it in the open position and tag to prevent application of power. Failure to do so may result in fatal electrical shock.

## AVERIISSEMENT

d'une réparation du ventilation ou d'une réparation du ventilateur, ne pas compter sur un sélecteur comme seul moyen de coupure de l'alimentation électrique. Si l'interrupteur d'alimentation est hors de vue, le verrouiller en position d'arrêt et apposer une plaquette interdisant son utilisation. À défaut, un choc électrique pourrait être fatal.

All electrical connections should be made by a qualified electrician.





Dayton Electric Mfg. Co. certifies
 that the fans shown hereon are
 licensed to bear the AMCA seal.
 The ratings shown are based on
 tests and procedures performed
 in accordance with AMCA
 Publication 211 and AMCA
 Publication 311 comply with the
 requirements of the AMCA

Certified Ratings Program.



Figure 1 - Dimensions

#### Dimensions

A Square	В	с	D	E
11 <sup>1</sup> /8"	4 15/16"	6"	2 <sup>3</sup> /8″	8"
13 <sup>1</sup> /8	5 <sup>9</sup> /16	5 <sup>1</sup> /8	2 <sup>3</sup> /8	10
15 <sup>1</sup> /8	6	6 <sup>1</sup> /8	2 <sup>3</sup> /8	12
19 <sup>1</sup> /8	6 <sup>1</sup> /2	6 <sup>1</sup> /8	2 <sup>3</sup> /8	16
21 <sup>1</sup> /8	8 <sup>3</sup> /4	6 <sup>1</sup> /8	3	18
	A Square 11 <sup>1</sup> /8" 13 <sup>1</sup> /8 15 <sup>1</sup> /8 19 <sup>1</sup> /8 21 <sup>1</sup> /8	A Square         B           11         1/8"         4         15/16"           13         1/8         5         9/16           15         1/8         6           19         1/8         6         1/2           21         1/8         8         3/4	A Square         B         C           11 1/8"         4 <sup>15</sup> / <sub>16</sub> "         6"           13 1/8         5 <sup>9</sup> / <sub>16</sub> 5 <sup>1</sup> / <sub>8</sub> 15 1/8         6         6 <sup>1</sup> / <sub>8</sub> 19 1/8         6 <sup>1</sup> / <sub>2</sub> 6 <sup>1</sup> / <sub>8</sub> 21 1/8         8 <sup>3</sup> / <sub>4</sub> 6 <sup>1</sup> / <sub>8</sub>	A Square         B         C         D           11 1/8"         4 15/16"         6"         2 3/8"           13 1/8         5 9/16         5 1/8         2 3/8           15 1/8         6         6 1/8         2 3/8           19 1/8         6 1/2         6 1/8         2 3/8           21 1/8         8 3/4         6 1/8         3

#### Performance

Certified CFM and Sones Licensed by AMCA \*

	CFM @ Static Pressure Shown								
	Prop.	0.0"	0.125"	0.250"	Sones	Nom		Nom.	
† Modeł	Dia.	SP	SP	SP	@0.0" SP	HP	Amps	RPM	
2C634B	7"	140	-		4.8	1/30	1.4	1550	
2C819B	10	585	285		6.6	1/30	1.4	1550	
2C710C	12	800	470		7.6	1/30	1.4	1550	
2C713B	16	1095	720	_	8.0	1/20	1.8	1550	
2C708C	18	1860	850	_	8.4	1/15	1.2	1050	

(\*) Performance shown is for Installation Type A, Free Inlet, Free Outlet. Speed (RPM) shown is nominal. Performance is based on actual speed of test. Performance ratings include the effects of guard and shutter in the airstream. Sound ratings shown are loudness values in fan sones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for Installation Type A, free inlet fan sone levels. (1) All units are speed controllable.

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# Dayton<sup>®</sup> Utility Shutter-Mounted Exhaust Fans

# General Safety Information (Continued)

- 1. Follow all local electrical and safety codes in the United States and Canada, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA) in the United States, and the Canadian Electric Code (CEC) in Canada.
- Always disconnect power source before working on or near a motor or its connected load.

**AWARNING** Motor will restart without warning after protector trips.

A CAUTION In United States to reduce the risk of injury to persons, OSHA complying guards are required when fan is installed within 7 feet of floor or working level.

**A CAUTION** In Canada to reduce the risk of injury to persons, CSA complying guards are required when fan is installed below 2.5 meters (8.2 feet) above floor or grade level.

- 3. Protect the power cable from coming in contact with sharp objects.
- Do not kink power cable and never allow the cable to come in contact with oil, grease, hot surfaces, or chemicals.

# A CAUTION Do not use in explosive

atmospheres.

- Make certain that the power source conforms to the requirements of your equipment.
- The fan frame and motor must be electrically grounded to a suitable electrical ground, such as a grounded water pipe or ground wire system.

#### Installation

1. The unit should be securely mounted in a rigid framework.

**NOTE:** Allowing the fan frame to flex or move will result in undue vibrations and possible premature motor or propeller failure.

- 2. Install any auxiliary components.
- 3. Connect power to the motor, using



Figure 2 - Wiring Diagram: 115 Volt Connection

**A CAUTION** Fan frame and motor must be securely and adequately grounded to a suitable electrical ground, such as a

ground water pipe or ground wiring system!

 Before activating the fan, doublecheck to ensure that there are no obstructions (framing, stud, shutter, etc.) which would interfere with proper fan operation.

#### Operation

- Keep the area free of objects that could impede air flow on both the intake and exhaust side of fan.
- For proper exhaust operation, a window, door, or louver should be opened on the opposite side of the area to be ventilated.
- Turn the fan on, the shutter will open automatically. When the unit is turned OFF, the shutter will close.
- Speed controllable units are designed to operate at a minimum of fifty percent line voltage.

#### Maintenance

AWARNING Do not depend on any switch as sole means of disconnecting power when installing or servicing the fan. If the power disconnect is out-of-sight, lock it in the open position and tag to prevent application of power. Failure to do so may result in fatal electrical shock.

AVERTISSEMENT Lors de l'installation ou d'une réparation du ventilateur, ne pas compter sur un sélecteur comme seul moyen de coupure de l'alimentation électrique. Si l'interrupteur d'alimentation est hors de vue, le verrouiller en position d'arrêt et apposer une plaquette interdisant son utilisation. À défaut, un choc électrique pourrait être fatal.

#### MINOR AND ROUTINE

- 1. Disconnect power source before servicing.
- 2. Lubricate the motor sleeve bearings every six months using S.A.E. 20 nondetergent oil.
- 3. Periodically clean the propeller, guard, motor, and shutter of any accumulated dirt.

#### PARTS REPAIR

- 1. Refer to illustration of parts placement (Figure 3).
- 2. Disconnect power before servicing.
- Remove the four screws holding the guard to the venturi panel. Remove the guard/motor/propeller assembly.
- 4. Loosen the setscrew on propeller hub and remove the propeller.

**A CAUTION** Do not repair damaged propellers. They should be replaced with a properly balanced replacement.

- 5. Loosen the nuts holding motor on guard and remove motor.
- Reassemble the unit in reverse order of disassembly.

A CAUTION Propeller is installed hub first on motor shaft, flush with end, and setscrew located over the flat area.

# 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

Address parts correspondence to: Grainger Parts P.O. Box 3074 1657 Shermer Road Northbrook, IL 60065-3074 U.S.A.



#### Figure 3 — Repair Parts Illustration

#### **Repair Parts List**

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Ref. No.	Description	Part Number 2C634B	For Models: 2C708C	2C710C	2C713B	2C819B	Qty.
1	Motor	13420001	13012001	13420001	13072002	13420001	1
2	Shutter assembly	09410001	09414001	09412001	09413001	09411001	1
3	Propeller	03124001	03174001	03172001	03173001	03125001	1
4	Intake guard	09602002	09606002	09604002	09605004	09603002	1
5	#10-16 x 5/8" SM Screw	*	*	*	*	*	4
6	#8-32 Spinlock nut	*	*	*	*	*	4

(\*) Standard hardware items, available locally.



# Dayton Utility Shutter-Mounted Exhaust Fans

#### Troubleshooting Chart

Symptom	Possible Cause(s)	Corrective Action		
Excessive noise	1. Dry motor bearings	1. Relubricate motor bearings		
	2. Loose propeller	2. Tighten setscrews in hub		
	3. Crooked or damaged propeller	3. Replace propeller		
Fan inoperative	1. Blown fuse or open circuit breaker	1. Replace fuse or reset circuit breaker		
	2. Defective motor	2. Repair or replace motor		
	3. Speed control off or too low	3. Turn controller on		
Insufficient air flow	1. Blocked intake or exhaust opening	1. Clear opening of obstruction or increase size of opening		
	2. Low voltage	2. Determine cause and correct		
	3. Speed control set too low	3. Increase speed with controller		

#### LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. Dayton® Utility Shutter-Mounted Exhaust Fans, 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.

LIMITATION OF LIABILITY. To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to and shall not exceed the purchase price paid.

WARRANTY DISCLAIMER. Dayton has made a diligent effort to illustrate and describe the products in this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the products are MERCHANTABLE, or FIT FOR A PARTICULAR PURPOSE, or that the products will necessarily conform to the illustrations or descriptions. Except as provided below, no warranty or affirmation of fact, expressed or implied, other than as stated in the "LIMITED WARRANTY" above is made or authorized by Dayton.

**PRODUCT SUITABILITY.** Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Dayton attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, review the product applications, and all applicable national and local codes and regulations, and be sure that the product, installation, and use will comply with them.

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, consequentially 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**. Dayton will make a good faith effort 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 U.S.A.

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



#### **Operating Instructions & Parts Manual**

#### 2C634B, 2C708C, 2C710C 2C713B, and 2C819B

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<sup>®</sup> Utility Shutter-**Mounted Exhaust Fans**

#### Description

Dayton utility exhaust fans are designed for exhaust applications in stores, offices, factories, shops, farm buildings, greenhouses, etc. Efficient, easy-to-install exhaust fans with automatic shutters. Model 2C634, 7" Shutter fan fits in half of an 8 x 16" concrete block. Shutter flanges have eight pre-punched 1/4 x 1/2" slotted mounting holes for ease of installation. 7 to 18" diameter deep pitched propeller. Fan guards have charcoal grey metallic polyester finish to resist corrosion. Wire guards comply with OSHA Federal 1/2" max. opening requirement. Totally enclosed, sleeve bearing 115V, 60 Hz motors. Shipped completely assembled. Optional Accessory: Speed controller for up to 3 amps, Part No. 4YC44.

#### Unpacking

- 1. Inspect for any damage that may have occurred during transit.
- 2. Shipping damage claim must be filed with carrier.
- 3. Check all bolts, screws, setscrews, etc. for looseness that may have occurred during transit. Retighten as required.
- 4. Before installing, rotate the propeller to be sure there are no obstructions which would interfere with proper operation. Adjust as required.

#### General Safety Information

AWARNING Do not depend on any switch as sole means of disconnecting power when installing or servicing the fan. If the power disconnect is out-of-sight, lock it in the open position and tag to prevent ..... application of power. Failure to do so may result in fatal electrical shock.

#### AVERTISSEMENT Lors de

l'installation ou d'une réparation du ventilateur, ne pas compter sur un sélecteur comme seul moyen de coupure de l'alimentation électrique. Si l'interrupteur d'alimentation est hors de vue, le verrouiller en position d'arrêt et apposer une plaquette interdisant son utilisation. À défaut, un choc électrique pourrait être fatal.

A CAUTION All electrical connections should be made by a qualified electrician.





Dayton Electric Mfg. Co. certifies that the fans shown hereon are licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 comply with the

requirements of the AMCA Certified Ratings Program.



1/4 x 1/2" Slots

#### Figure 1 - Dimensions Dimensions

Model	A Square	В	c	D	E	
2C634B	11 1/8"	4 15/16"	6"	2 <sup>3</sup> /8″	8″	
2C819B	13 <sup>1</sup> /8	5 <sup>9</sup> /16	5 <sup>1</sup> /8	2 <sup>3</sup> /8	10	
⇒2C710C	15 <sup>1</sup> /8	6	6 1/8	2 <sup>3</sup> /8	12	
2C713B	19 <sup>1</sup> /8	6 <sup>1</sup> /2	6 <sup>1</sup> /8	2 <sup>3</sup> /8	16	
2C708C	21 <sup>1</sup> /8	8 <sup>3</sup> /4	6 <sup>1</sup> /8	3	18	

#### Performance

Certified CFM and Sones Licensed by AMCA \*

		CFM @ Static Pressure Shown						
† Model	Prop. Dia.	0.0" SP	0.125" _ <b>SP</b>	0.250″ S <u>P</u>	Sones @0.0" SP	Nom. HP	Amps	Nom. RPM
2C634B	7"	140	_	-	4.8	1/30	1.4	1550
2C819B	10	585	285	_	6.6	1/30	1.4	1550
2C710C	12	800	470		7.6	1/30	1.4	1550
2C713B	16	1095	720	_	8.0	1/20	1.8	1550
2C708C	18	1860	850	_	8.4	1/15	1.2	1050

(\*) Performance shown is for Installation Type A. Free Inlet, Free Outlet. Speed (RPM) shown is nominal. Performance is based on actual speed of test. Performance ratings include the effects of guard and shutter in the airstream. Sound ratings shown are loudness values in fan sones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation Type A, free inlet fan sone levels. (†) All units are speed controllable.

Form 552035

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# Dayton<sup>®</sup>Utility Shutter-Mounted Exhaust Fans

# General Safety Information (Continued)

- 1. Follow all local electrical and safety codes in the United States and Canada, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA) in the United States, and the Canadian Electric Code (CEC) in Canada.
- Always disconnect power source before working on or near a motor or its connected load.

**AWARNING** Motor will restart without warning after protector trips.

A CAUTION In United States to reduce the risk of injury to persons, OSHA complying guards are required when fan is installed within 7 feet of floor or working level.

**A CAUTION** In Canada to reduce the risk of injury to persons, CSA complying guards are required when fan is installed below 2.5 meters (8.2 feet) above floor or grade level.

- 3. Protect the power cable from coming in contact with sharp objects.
- Do not kink power cable and never allow the cable to come in contact with oil, grease, hot surfaces, or chemicals.

# A CAUTION Do not use in explosive

- atmospheres.
- Make certain that the power source conforms to the requirements of your equipment.
- The fan frame and motor must be electrically grounded to a suitable electrical ground, such as a grounded water pipe or ground wire system.

#### Installation

1. The unit should be securely mounted in a rigid framework.

**NOTE:** Allowing the fan frame to flex or move will result in undue vibrations and possible premature motor or propeller failure.

- 2. Install any auxiliary components.
- Connect power to the motor, using an approved wiring method.



Figure 2 - Wiring Diagram: 115 Volt Connection

**A CAUTION** securely and adequately grounded to a suitable electrical ground, such as a ground water pipe or ground wiring system!

 Before activating the fan, doublecheck to ensure that there are no obstructions (framing, stud, shutter, etc.) which would interfere with proper fan operation.

#### Operation

- 1. Keep the area free of objects that could impede air flow on both the intake and exhaust side of fan.
- For proper exhaust operation, a window, door, or louver should be opened on the opposite side of the area to be ventilated.
- 3. Turn the fan on, the shutter will open automatically. When the unit is turned OFF, the shutter will close.
- Speed controllable units are designed to operate at a minimum of fifty percent line voltage.

#### Maintenance

AWARNING Do not depend on any switch as sole means of disconnecting power when installing or servicing the fan. If the power disconnect is out-of-sight, lock it in the open position and tag to prevent application of power. Failure to do so may result in fatal electrical shock.

# AVERIISSEMENT Lors de

d'une réparation du ventilateur, ne pas compter sur un sélecteur comme seul moyen de coupure de l'alimentation électrique. Si l'interrupteur d'alimentation est hors de vue, le verrouiller en position d'arrêt et apposer une plaquette interdisant son utilisation. À défaut, un choc électrique pourrait être fatal.

#### MINOR AND ROUTINE

- 1. Disconnect power source before servicing.
- Lubricate the motor sleeve bearings every six months using S.A.E. 20 nondetergent oil.
- Periodically clean the propeller, guard, motor, and shutter of any accumulated dirt.

#### PARTS REPAIR

- 1. Refer to illustration of parts placement (Figure 3).
- 2. Disconnect power before servicing.
- Remove the four screws holding the guard to the venturi panel. Remove the guard/motor/propeller assembly.
- 4. Loosen the setscrew on propeller hub and remove the propeller.

**A CAUTION** Do not repair damaged propellers. They should be replaced with a properly balanced replacement.

- 5. Loosen the nuts holding motor on guard and remove motor.
- 6. Reassemble the unit in reverse order of disassembly.

A CAUTION Propeller is installed hub first on motor shaft, flush with end, and setscrew located over the flat area. Dayton Operating Instructions and Parts Manual



# 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

Address parts correspondence to: Grainger Parts P.O. Box 3074 1657 Shermer Road Northbrook, IL 60065-3074 U.S.A.





#### **Repair Parts List**

Ref.		Part Number	For Models:				
No.	Description	2C634B	2C708C	2C710C	2C713B	2C819B	Qty.
1	Motor	13420001	13012001	13420001	13072002	13420001	1
2	Shutter assembly	09410001	09414001	09412001	09413001	09411001	1
3	Propeller	03124001	03174001	03172001	03173001	03125001	1
4	Intake guard	09602002	09606002	09604002	09605004	09603002	1
5	#10-16 x 5/8" SM Screw	*	*	*	*	*	4
6	#8-32 Spinlock nut	*	*	*	*	*	4

(\*) Standard hardware items, available locally.


Dayton Operating Instructions and Parts Manual

### Dayton<sup>®</sup> Utility Shutter-Mounted Exhaust Fans

### Troubleshooting Chart

Symptom	Possible Cause(s)	Corrective Action			
Excessive noise	1. Dry motor bearings	1. Relubricate motor bearings			
	2. Loose propeller	2. Tighten setscrews in hub			
	3. Crooked or damaged propeller	3. Replace propeller			
Fan inoperative	1. Blown fuse or open circuit breaker	1. Replace fuse or reset circuit breake			
	2. Defective motor	2. Repair or replace motor			
	3. Speed control off or too low	3. Turn controller on			
Insufficient air flow	1. Blocked intake or exhaust opening	1. Clear opening of obstruction or increase size of opening			
	2. Low voltage	2. Determine cause and correct			
	3. Speed control set too low	3. Increase speed with controller			

### LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. Dayton® Utility Shutter-Mounted Exhaust Fans, 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.

LIMITATION OF LIABILITY. To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to and shall not exceed the purchase price paid.

WARRANTY DISCLAIMER. Dayton has made a diligent effort to illustrate and describe the products in this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the products are MERCHANTABLE, or FIT FOR A PARTICULAR PURPOSE, or that the products will necessarily conform to the illustrations or descriptions. Except as provided below, no warranty or affirmation of fact, expressed or implied, other than as stated in the "LIMITED WARRANTY" above is made or authorized by Dayton.

**PRODUCT SUITABILITY.** Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Dayton attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, review the product applications, and all applicable national and local codes and regulations, and be sure that the product, installation, and use will comply with them.

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, consequentially 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**. Dayton will make a good faith effort 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 U.S.A.





### 7200 Series

A real value in general purpose rotameters. Vertical connections are from 3/8" NPT to 2" NPT

### Description

Metering Tube Machined Cast Acrylic

Internal Components 316L Stainless Steel

Inlet/Outlet Fittings NPT, Vertical

Fitting Material Standard: PVC (not for air service) Optional: 316 Stainless Steel, Brass, Aluminum

Elastomers Standard: EPR Optional: Buna-N, Viton®

### Options

Certified Calibrations Conform to ISA RP 16.6

Scales Can be produced in any volumetric unit



### Acrylic Tube

### Performance

Capacities 1 to 200 GPM – Water 4 to 245 SCFM – Air

Scale 127 mm (5") Direct reading

Accuracy ± 3% to ± 6% of Full Scale Flow See specifications table

Turndown 10:1 to 12.5:1 unless otherwise indicated

Repeatability 1% to 2% See specifications table

Max Temperature Water – 130° F (54° C) Air – 100° F (38° C)

Max Pressure Water -- 150 psig Air -- 100 psig

Ambient Temperature 33° F to 125° F (1° C to 52° C)

# Kourse and a serve

### Caution:

Meters used in gas service are designed to operate at 14.7 psia. Meters used in pressure gas service must be shielded using 3/8" polycarbonate to protect personnel and equipment in the event of tube failure.

А 80 70 년 60 Ξž 50 В 1111 40 30 20 10

Refer to specification table on page 7

### 7200 Series Specifications:

Order Number	Flow GPM - Water	Flow SCFM - Air	F.S. Accuracy±/ Repeatability	Press. Drop (In. / W.C.)	Connection Size	Dimen A	sions B
0051	1	4	3%/2%	2.9	3/8" FNPT	1.375″	8.25″
0052	1	4	3%/2%	2.9	1/2" FNPT	1.375″	8.25″
0061	2	8	3%/2%	5.2	3/8" FNPT	1.375″	8.25″
0062	2	8	3%/2%	5.2	1/2" FNPT	1.375″	8.25″
0071	3.5	14	3%/2%	9.5	3/8" FNPT	1.375″	8.25″
0072	3.5	14	3%/2%	9.5	1/2" FNPT	1.375″	8.25″
0081	5	20	3%/2%	13.1	3/8" FNPT	1.375″	8.25″
0082	5	20	3%/2%	13.1	1/2" FNPT	1.375″	8.25″
0151	5	20	3%/1%	10	1" FNPT	2.000″	10.25″
0161	10	43	3%/1%	12	1" FNPT	2.000″	10.25″
0171	15	62	3%/1%	18	1" FNPT	2.000″	10.25″
0181	21	86	3%/1%	22	1" FNPT	2.000″	10.25″
0191	30.5	_	3%/1%	26	1" FNPT	2.000″	10.25″
0201	40	<u> </u>	6%/2%	32	1 1/2" MNPT	2.000″	12.06″
0211	50	_	6%/2%	38	1 1/2" MNPT	2.000″	12.06″
0221	40	165	4%/1%	18	2" FNPT	3.000″	13.25″
0231	60	245	4%/1%	25	2" FNPT	3.000″	13.25″
0241	80	-	4%/1%	30	2" FNPT	3.000″	13.25″
0251	100*	-	4%/1%	35	2" FNPT	3.000″	13.25″
0261	120*	_	6%/2%	45	2" FNPT	3.000″	13.25″
0271	160*		6%/2%	60	2" FNPT	3.000"	13.25″
0281	200*	_	6%/2%	80	2" FNPT	3.000″	13.25″

* These meters have less than 10:1 turndown. See table for specifics.										
Order Number	Flow Range	Actual Turndown								
0251	20 - 100 GPM	5:1								
0261	30 - 120 GPM	4:1								
0271	45 - 160 GPM	3.55:1								
0281	55 - 200 GPM	3.63:1								

Max. Pr	essure	Max. Temp				
Water	Air	Water Air				
150 psig	100 psig	130° F	100° F			

Ordering: Use the following guide to determine the specific product number you require.

720	5			
Meter Series	Order number from	Fitting	O-Ring	Fluid To
	specifications table above	Material	Material	Be Metered
		Brass - 1	EPR - 1	GPM—Liquid - W
		316 SSL - 2	Buna-N - 2	SCFM-Air - A
		PVC - 3	Viton® - 3	
		Aluminum - 6		<b>Example:</b> 7205 - 0281 - 3

### INSTALLATION INSTRUCTIONS for 7200, 7300, 7400, 7500 & 7800 Meters

To get the most from the flowmeter you are about to install take time to read the following information before beginning work.

1) Carefully inspect the meter for damage that may have occurred during shipping.

Make sure your pressure, temperature, fluid and other requirements are compatible with the meter.

Select a suitable location for installation to prevent excess stress on the meter which may result from:

a) Misaligned pipe.

b) The weight of related plumbing.

- c) "Water Hammer" which is most likely to occur when flow is suddenly stopped as with quick closing solenoid and operated valves.
- (If necessary a surge chamber should be installed. This will also be useful in high pressure start-up situations.)
- d) Thermal expansion of liquid in a stagnated or valve isolated system.
- e) Instantaneous pressurization which will stress the meter and could result in tube failure.

Note: In closed thermal transfer or cooling systems install the meter in the cool side of the line to minimize meter expansion and contraction and possible related fluid leaks.

4) Handle the meter carefully during installation.

a) Use an appropriate amount of Teflon tape on external pipe threads before making connections. Do not use paste or stick type thread sealing products.

b) Extreme caution should be exercised when using PVC solvent cement around Acrylic. Solvents can cause acrylic to stress crack.

- 5) Install the meter vertically with the inlet port at the bottom.
- 6) Meters should be cleaned with a mild soap solution. This will be an effective cleaner of rust stains. Caution must be used so that materials of construction are not damaged by cleaning solutions. Hard water deposits can be removed with a 5% acetic acid solution (vinegar).

CAUTION:

- 7) Meters are not oxygen cleaned. Use with incompatible fluids will cause O-rings to swell and break tubes. Meters used in gas service should have suitable valves plumbed in at the inlet and outlet of the meter. The valve at the outlet should be used to create back pressure as required to prevent float bounce. The inlet valve should be used for throttling purposes.
- 8) Meters with shields must never be operated without shields securely in place. Failure to use safety shields may result in serious injury to personnel and property.
- 9) Meters without case enclosures are designed to operate at 14.7 psia. Meters in pressure service must be sufficiently shielded using 3/8" polycarbonate to protect personnel and equipment in the event of tube failure.
- 10) Pressure and temperature maximums must never be exceeded.

### PRESSURE/TEMPERATURE

Pressure and temperature ratings for 7200, 7400, 7500 models are inversely proportional. 7310 and 7810 models with plastic fittings are inversely proportional, while ratings for 7310 and 7810 Series models with metal fittings are simultaneous.

7200 Series In Acrylic Tube/PV 2" Tube Diamete 3" Tube Diamete Acrylic Tube/Alu 2" Tube Diamete 3" Tube Diamete	<b>n-Line Acrylic Mod</b> C Fittings—Water er er uminum Fittings—Air er er	els PSIG /⁰F 150/130 125/130 PSIG/⁰F 100/100 100/100	<b>7330, 78</b> Tube Size 4,5,6 9	30 Series Union Ends I Polysulfone Tube PVC Fittings PSIG/ °F 150/130 125/130	<b>Models</b> Polysulfone Tube PVDF Fittings PSIG/⁰F 150/160 125/160
<b>7400 Series G</b> PVC Fittings PSIG/ ⁰F 130/100	Iass Tube Models PVDF Fittings PSIG/ ⁰F 150/150	SS Fittings PSIG/ °F 200/200	<b>7310, 78</b> ⊤ube Size	10 Series Stainless Ca Polysulfone Tube Metal Fittings PSIG/ ºF	<b>se Models</b> Polysulfone Tube PVC Fittings PSIC/95
7500 Series A Water Service Air Service	<b>crylic Block Mode</b> PSIG/ºF 125/130 100/100	ls	4,5,6 9	200/200 150/200	150/130 125/130

### NOTE

Pressure and temperature limits are based on a study of the engineering data for particular materials used in construction and on the design of individual models. This information is supplemented by destructive testing results. Maximum pressures suggested are at 70° F. Maximum temperatures suggested are at 0 psig, so pressure and temperature maximums are inversely proportional except for stainless case enclosed meters. Pressure and temperature maximums for these meters are simultaneous. Meters with stainless enclosures must **never** be operated without shields securely in place. Meters exposed to difficult environments such as those created by certain chemicals, excessive vibration or other stress inducing factors could fail at or below the suggested maximums. **Never** operate meters above pressure and temperature maximums. eter failure could result in damage to equipment and serious personal injury. Always use suitable safety gear including OSHA approved eye otection when working around meters in service. We are happy to pass along chemical compatibility information that has been published by the manufacturers of raw materials used in our products; however, this information should not be construed as a recommendation made by King Instrument Company, Inc. for a specific application. Specifications are subject to change without notice.

### KING INSTRUMENT COMPANY

12700 Pala Drive, Garden Grove, CA 92841 Phone (714) 891-0008 Fax (714) 891-0023



### **400 Series Temperature Controls**

Types: B400, B402, B403, C400, C402,C403, E400, E402, E403, F400, F402, F403

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

Types B & C (Immersion Stem)

Temperature variations are sensed by a liquid filled sensor which expands or contracts against a bellow which in turn actuates or deactuates one, two or three snap-action switches at a predetermined set point(s).

### Type E & F (Bulb & Capillary)

Temperature variations of a liquid filled sensing bulb are hydraulically transmitted to a bellow which either actuates or deactuates one, two, or three snap-acting switches at a pre-determined set point(s). Set points are adjusted by turning an internal calibrated pointer and dial (E & B types) or internal adjustment screw (F & C types).

### Part I - Installation

Toois Needed Screwdriver Hammer Adjustable wrench

### MOUR HIRE

INSTALL UNIT WHERE SHOCK, VIBRATION AND TEM-PERATURE FLUCTUATIONS ARE MINIMAL. ORIENT UNIT SO THAT MOISTURE IS PREVENTED FROM ENTERING THE ENCLOSURE. DO NOT MOUNT UNIT IN AMBIENT TEMPERA-TURES EXCEEDING PUBLISHED LIMITS.

400 Series temperature controls can be mounted in any position, provided the electrical conduit is not facing up. Three cast-in knockouts for 3/4" electrical conduit are located on the side and rear of the enclosure. These can easily be knocked out by placing the blade of a screwdriver in the groove and rapping sharply with a hammer. Mount the unit via the (2) 1/4" screw clearance holes on the enclosure. See Dimensions. Units may also be mounted via the NPT on immersion stem.



ALWAYS HOLD A WRENCH ON THE IMMERSION STEM 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. For best control, 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 instruments range limits.

### 



DISCONNECT ALL SUPPLY CIRCUITS BEFORE WIRING.



ELECTRICAL RATINGS STATED IN LITERATURE AND ON NAMEPLATE SHOULD NEVER BE EXCEEDED. OVER-LOAD ON A SWITCH CAN CAUSE FAILURE ON THE FIRST CYCLE.



WIRE UNITS ACCORDING TO LOCAL AND NATIONAL ELECTRICAL CODES. MAXIMUM RECOMMENDED WIRE SIZE IS 14 AWG.

Connect conduit to the case and wire directly to the switch terminals according to local and national electrical codes. Bring the wires up to terminals from the rear of the case. (See Figure 1.) If manual reset switch or DPDT options are used, lead wires are supplied, color coded as follows:

	Switch 1	Switch 2	
Common	Violet	Yellow	
Normally Open	Blue	Orange	
Normally Closed	Black	Red	



ALLOW ENOUGH SLACK SO AS NOT TO AFFECT SWITCH MOVEMENT WHEN MAKING SETTING ADJUSTMENTS AND ENSURE THAT THE WIRES ARE NOT TOUCHING THE COVER WHEN INSTALLED.

NOTE: For larger wire gauges, a one time shift may be experienced or expected due to space limitations within the enclosure. Verify setpoint after installation.



Figure 1

NOTE: The middle switch assembly is omitted for dual switch controllers. The outer two switch assemblies are omitted for single switch controllers. Type "C" and "F" controls have internal screw adjustments and type "B" and "E" have cam assemblies for internal calibrated adjustments.

### Part II - Adjustments

Tools Needed Screwdriver

NOTE: For set point adjustments and re-calibration, connect control to a calibrated temperature bath.

### Type C400 & F400

Remove cover. Switch has screw adjustments inside enclosure. If switch transfer point differs from actual temperature, adjust setting. To RAISE the temperature setting turn the screw IN (clockwise) and to LOWER the setting turn the screw OUT (counter clockwise). When making adjustments, do not exceed the proof temperature rating on nameplate.

### Types C402, C403, F402 & F403

Remove cover. Follow same procedure as paragraph above. Switches may be set together or apart, up to 100% of range scales. On dual switch models, either switch may be set high. On triple switch models, the third (middle) switch has no over-travel mechanism and must always be set to the highest temperature when switches are set apart. Altering the setting of one switch will usually have little effect on the other(s), however re-adjustment may be desired at a critical temperature setting and after changing switch(es) or thermal assembly.

### Types B400, B402, B403, E400, E402 & E403

Controls are factory calibrated for maximum accuracy at the dial midpoint. Switches may be set together or apart up to 100% of the range scale. On dual switch models either switch may be set high. On triple switch models, the third (middle) switch has no over-travel mechanism and must always be set to the highest temperature when the switches are set apart. Altering the setting of one switch will usually have little effect on the other(s), however re-calibration may be desired at a critical setting or after changing switch(es) or thermal assembly.

To re-calibrate, turn pointer to desired set point. If the actual temperature and set point temperature do not agree, turn zero

adjustment screw clockwise to raise and counterclockwise to lower set temperature setting (See Figure 2)

### **Re-Calibration Adjustment**



Figure 2

Types With Manual Reset (Option 1530

These optional models incorporate a snap switch that, when actuated, remains tripped until temperature decreases and the reset button is manually depressed to the reset position. On multi-switch units, this switch must be set to the highest setting.

### **Part III - Replacements**

<u>Tools Needed</u> Screwdriver Adjustable Wrench to 1 1/8"

USE ONLY FACTORY AUTHORIZED REPLACEMENT PARTS AND PROCEDURES. DISCONNECT ALL LIVE CIRCUITS BEFORE PROCEEDING. COMPONENTS FOR REPLACEMENT PARTS INCLUDE THE SWITCHES AND THERMAL ASSEMBLIES ONLY. ORDER PARTS BY NAMEPLATE INFORMATION DATA ON MODEL, RANGE, OPTIONS AND ELECTRICAL RATINGS.

### REPLACEMENT OF SWITCH(ES)

1) Disconnect leadwires.

 Remove the two mounting screws. On multiswitch controls, first remove switch bias springs. (See Figure 1)

 Insert replacement switch and replace screws and bias springs.

4) Check switch set point and re-calibrate per PART II if necessary.

### REPLACEMENT OF THERMAL ASSEMBLIES

### Models 1BS-8BS

1) With temperature sensor facing up, loosen 3/8" hex dress nut and remove 1 1/8" hex nut from sensor housing.

2) Remove thermal assembly.

 Carefully place new thermal assembly into housing and secure it with 1 1/8" hex nut. Tighten dress nut until snug.

4) Recalibrate per PART II.

### Modeis 120, 121

1) With temperature sensor facing up, loosen 1/4" hex screw (4).

2) Remove thermal assembly.

3) Carefully place new thermal assembly over housing and secure it with 1/4" hex screw (4).

4) Recalibrate per PART II.



### Dimensions



Models 120-121



Models 2BS-8BS

### **RECOMMENDED PRACTICES**

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 instructionsprovided with unit must be read and understood.

 To avoid damaging unit, proof pressure and max temperature limits stated in Itterature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to proof pressure or max temperature is acceptable on a limited basis (i.e.start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at proof pressure or maximum temperature limits could reduce sensor ifle.

 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 dangerous runaway condition could result.

 The adjustable range must be selected so that incorrect, inadvertent or malicious setling at any range point can not result in an unsafe system condition.

 Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. Orient unit so that moisture does not enter the enclosure via the electrical connection.

Unit must not be attared 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. Check unit immediately.

 Preventative maintenance/periodic testing is necessary for critical applications where damage could endanger property/ personnel.

· For all applications, a factory set unit should be tested before use.

Electrical ratings stated in literature and on nameplata must not be exceeded. Overload on a switch can cause damage, possible on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.

- · Use only factory authorized replacement parts and procedures.
- · Do not mount unit in ambient temp. exceeding published limits.

 For remote mounted temperature units, capillary lengths beyond 10 feet can increase chance of error, and may require re-calibration of set point and indication.

### LIMITED WARRANTY

UE warrants that the product thereby 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 UE (F.O.B. UE); provided, however, that this warranty applies only to equipment found to be so defective within a period of 12 months after installation by buyer but not to exceed 18 months after delivery by the seller. Except for the limited warranty of repair and replacement stated above, UE disclaims all warranties whatsoever with respect to the product, including all implied warranties of merchantability or fitness for any particular purpose.

### LIABILITY LIMITATION

The sole and exclusive remedy of buyer for any liability or seller for any claim, including 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 imputed to seller, is limited to the limited warranty or repair and replacement stated herein. In no event

shall the seller be liable for any special, indirect, consequential or other damages or like general nature, including, without liamation, loss of profits or production, or loss or expenses of any nature, incurred by the buyer or any third party.



UNITED ELECTRIC Controls

180 Dexter Avenue, P.O. Box 9143 Watertown, MA 02272-9143 USA Telephone: 617 926-1000 Fax: 617 926-2568 http://www.ueonline.com

### 3989K

### Thermometers

### Application

Industrial type design for fluid medium which does not corrode 304 stainless steel.

### Size

2" (50.8 mm) - Type TI.20

### Accuracy

±1.0% full scale value (ASME B40.3)

### Min. / Max. Ranges

-100°F to 1000°F (and equivalent Celsius)

### Working Range

Steady: full scale value Short time: 110% of full scale value

### Under / Over Range Protection

Temporary over or under range tolerance of 50% of scale up to 500°F (260°C). For ranges above 500°F, maximum over range is 800°F; continous, 1000°F intermittent.



### Standard Features

Connection

Material: 304 stainless steel Center backmount (CBM) ¼\* NPT

### Stem

Materiai: 304 stainless steel Diameter: ¼" (6.35 mm) Length: 21½" to 24" (63.5 mm to 609.6 mm)

### Measuring Element

Bi-metal helix

### Case

Material: 304 stainless steel Hermetically sealed per ASME B40.3 standard

Dial White aluminum, dished, with black markings

Pointer

Blackaluminum

### Standard Scales

Single: Fahrenhelt or Celsius Dual: Fahrenheit (outer) and Celsius (Inner)

Window Flat instrument glass

### Weight

2" - 5 oz. Add 1 oz. for every 2" of stem length

### **Bimetal Thermometers**

All Stainless Steel Construction Back Connection Without External Reset Type TI.20



### STANDARD RANGES

Fahrenholt	Dual Scale F & C	Celsius
Single Scale	F Outer, C Inner	Single Scale
-100/150 F	-100/150 F & -70/70 C	-50/50 C
-40/120 F	-40/120 F & -40/50 C	-20/120 C
0/140 F	0/140 F.& -20/60 C	0/50 C
0/200 F	0/200 F & -15/90 C	0/100 C
0/250 F	0/250 F & -20/120 C	0/150 C
20/240 F	20/240 F & -5/115 C	0/200 C
25/125 F	25/125 F & -5/50 C1	0/250 C
50/300 F	50/300 F & 10/150 C	0/300 C
50/400 F	50/400 F & 10/200 C	0/450 C1
50/550 F	50/500 F & 10/260 C	100/550 C1
150/750 F	150/750 F & 65/400 C	
200/1000 F1	200/1000 F & 100/540 C1	

Not recommanded for continuus service over 800°F (425°C)

### Dampening

Viscous silicone to minimize pointer oscillation (ranges below 400°F)

Order Options (min. order may apply) Special scales and dial markings Acrylic windows Calibration certification traceable to NIST



Type TI.20

,	WIKA TYPE	DIAL BOZE	Α.	Π	С	S (Stem Length)
	20	2" (50.8 mm)	2- 1/10" (\$2.4 mm)	7/10° (11,1 mm)	1/4* (0.4 mm)	Ast Reporting

Note: Thermowells for temperature instruments are recommended for all process systems where pressure, velocity, or viscous, abrasive and corrosive materials are present individually or in combination. A properly selected thermowell protects the temperature instrument from possible damage resulting from these process variables. Furthermore, a thermowell permits removal of the temperature instrument for replacement, repair or testing without effecting the process media or the system. STEM LENGTH 2% (83.5 mm) 4" (101.8 mm) 6" (152.4 mm) 9" (228.8 mm) 12" (304.8 mm) 15" (381.0 mm) 18" (157.2 mm) 24" (609.8 mm)

### LIQUID FILLED GAUGES

### 4053K

### ► LIQUID FILLED SERIES #400 <u>STAINLESS STEEL CASE</u> 1½", 2", 2½" and 4" Gauges

This series is designed for use with air, gas, oil and water or any medium not corrosive to brass or bronze. Liquid filled gauges are recommended for reducing shock waves caused by pressure or vibration fluctuations.

### **STANDARD** FEATURES:

### **MOVEMENT:** Brass.

**BOURDON TUBE:** C Shaped in phosphor bronze up to 600 psi and Helical above 600 psi.

POINTER: Black enamelled aluminum.

DIAL: White aluminum.

WINDOW: Polycarbonate. (Temperature compensating)

LIQUID FILL: Glycerin.

**CONNECTION:** 1/8 NPT male standard on  $1\frac{1}{2}$ " size. 1/4 NPT male connection at bottom, or back of case on 2",  $2\frac{1}{2}$ " and 4" sizes.

ACCURACY: ASME/ANSI B40.1 Grade A (2-1-2%)

\* Additional options available as noted on next page.



-

11/2", 2", 21/2" and 4" SIZES

 $\Box$  Standard gauge scales, outer scale is PSI, inner scale is metric (kPa & Bar).

C> FD - Available Dry

### **STANDARD RANGES:**

STANDARD D	AVAILABLE RANGES FOF SIZES:		AJOR	MINOR	ORDER	STANDARD D	AVAILABLE RANQES FOR FIZES:			MAJOR	MIMOR	ORDEN			
PLANCE	RANGE IN BAR 24 28			2 ½ and 4'	(pal)	(pa))	CODE	RANCE	IN BAR	1½* 2*		2 %* and 4*	(p4)	(pa)	CODE,
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30~-0-15 pai	-1:0·1 bar	~	~	~	5	.5	3015	0-300 psl	0-20 bnr	~	~	~	50	5	300
30°-0-30 pai	-1 <b>:0:</b> 2 bar	~	~	~	10	1	3030	0-400 pai	0-25 bar	1	~	~	100	10	400
30°-0-60 psi	-1-0-4 bar	*	~	~	10	1	3080	0-600 pai	0-40 bar	~	~	~	100	10	800
30°-0-100 pai	-1.0.7 bar	*	~	~	20	2	30100	0-1000 psi	0-70 bar	*	~	~	200	20	1000
30"-0-150 psł	•1·0·10 bar	*	r	~	20	2	30150	0-1500 psl	0-100 bor	1	~	~	200	20	1500
30°-0-200 psi	-1-0-14 bar	*	~	~	40	4	30200	0-2000 psi	0-140 bar	v	~	~	500	50	2000
30°-0-300 psi	₄1 v0·20 bar	v	~	~	50	5	30300	0-3000 pai	0-200 bar	~	-	-	500	50	3000
, 0-15 psi	0-1 bar	¥	~	r	2	,z	15	0-5000 psi	0-315 bot	r	r	~	1000	100	5000
0-30 ps)	0-2 bar	~	~	~	5	.5	30	0-6000 psi	0-400 ber			~	1000	100	6000
0-60 p±i	0–4 bar	V	r	~	10	1	60	0-10000 psi	0.700 bar			-	2000	200	10000
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0-180 pał	0-11 bяг	۲.	~	r	20	2	160								

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STYLE L	•	STY	'LE B	1		STY	'LE U		ST	YLE F			
304 Stainless Steel Ca Bottom Connection	5e,	304 Stainless Steel Case Back Connection				304 Stainless Steel Case, Back Connection with U-Clamp				304 Stainless Steel Case, Back Connection, Front Flange with Three Mounting Holes			
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11/2	. 8	1-47/64"	1-1/32"	1-47/64*	N/A	N/A	21/2*	8	2-41/64*	1-7/84"	1-57/64*	N/A	N/A	7 11 17
11%*	U	1-47/64*	1-1/32"	1-47/64*	1-37/64*	1-55/64*	21/2*	U	2-41/84*	1-7/84*	1.57/64*	2-1/2"	1-7/84	
11/5*	F	1-47/84*	1-1/32*	1-47/84	1-37/64*	2-13/32	21/5	F	2-41/84*	1-7/64*	1-57/64*	2-1/2*	2-9/32	
2'	L	2-1/8"	1-1/16"	1-47/64*	N/A	N/A	4"	L	4-3/32*	1-17/64*	2-7/8*	N/A	N/A	
2"	В	2-1/8"	1-1/18"	1-57/84*	N/A	N/A	4*	B	4-3/32*	1-17/64*	2-1/8*	N/A	N/A	)
2'	U	2-1/8"	1-1/16"	1-57/B4*	1-31/32"	2-9/32*	4*	U	4.3/32*	1-17/84*	2-1/8*	1*	4-13/64"	
2"	F	2-1/8"	1-1/18*	1-57/64*	1-31/32*	2-3/4'	4"	F	4-3/32*	1-17/64*	2-1/8"	4*	5-19/64*	
						•	•		the second se					

### TO ORDER:

Additional options - To order please specify option.

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-1-11/14V

11- And

	K
Description:	Option:
Covers	Rubber Case Cover
Connection	Reduce connection from 1/4 NPT to 1/8 NPT
Dial	Special Art Work or Logo
Pointer	Maximum Pointer (Dry Only)
Window	Glass (Dry Only)
Accuracy	Certification

	Ordering Nu	umb	er - Con	stri	uct by selecti	ing	one item f	топ	each of the c	olur	nns below:
1	Dial Siza:	2	Series Number:	Ξ	Fill Option:	4	Connection Size:	5	Type Connection:	6	Ranga Coda:
	$15 = 1\%^{\circ}$ $20 = 2^{\circ}$ $25 = 2\%^{\circ}$ $40 = 4^{\circ}$		≖ 400		FG = GLYCERIN · FS = SILICONE FD = DRY		01≖1/8 NPT 02=1/4 NPT		L=BOTTOM B=BACK U=U-CLAMP F=FRONT FLANGE		See standard range
	Exampla: 25400FG02L100										
	25		400		FG		OZ		L	1	100
					1.7						

AVAILABLE CASE STYLES AND DIMENSIONS:

			1	_	Τ.			1					
	Case, It Flange J Holes			ш —	N/A	N/A	1-7/64	2-9/32	NIA	NIA	4-13/64	5-19/64	
YLE	less Steel tion. Fron Mounting			Q	N/A	NIA	2-1/2"	2-1/2-	N/A	N/A	4,	4"	
ST	304 Stain tck Connec with Three	A stand		0	2-3/32*	1-57/64"	1-57/64"	1-57/64	2-7/8'	2-1/8	2-1/8"	5-1/8	
-	e, lamp Ba			B	1-7/64*	1-7/64"	1-7/64"	1-7/64	1-17/64"	1-17/64	1-17/64	1-17/64	
LEU	s Steel Cas n with U-C	A	Sons and a second secon	A	2-41/64	2-41/64	2-41/64"	2-41/64	4-3/32	4-3/32*	4-3/32	4-3/32"	ı
STYI	14 Stainles		DIRAER	STYLE:	Ļ	8	n	ц	-	в	D	Ľ.	
	30 Back (			SIZE	21/2*	2%	21/2	2'4"	4.	4"	4.	4	
				ω	N/A	NIA	1-55/64*	2-13/32"	NIA	NIA	2-9/32"	2-3/4	
.TE B .	is Steel Cas nnection		STOKS	a	NIA	N/A	1-37/64"	1-37/64	N/A	NIA	1-31/32"	1-31/32	
STY	304 Stainles Back Co	IP The second and a second sec	DIME	c	1-1/2	1-47/64"	1-47/64"	1-47/64	1-47/64	1-57/64	1-57/64*	1-57/64"	
		- 2		63	1-1/32	1.1/32	1-1/32"	1-1/32	1-1/16	1-1/16"	1-1/16	1-1/16"	
LEL	Steel Case	Le un antimore la constance de	SIONS	A	1-47/64-	1-47/64	1-47/64	1-47/64	2-1/8"	2-1/8	2-1/8"	2-1/8	
STYI	4 Stainless Bottom Co			STYLE:	L L	8	2	ц.		m	n	ш.	
	0 E			SIZE	115	11%	1%	11/5	2,	2°	<b>.</b>	2*	

Additional options – To order please specify option TO ORDER:

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Description:

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Keep you in control		
	7500/751 WARNING: Read page 2 first ACHTUNG: Lesen Sie zuers RECOMMANDATION IM Reportez-vous tout d'abord à la	<b>ODIN</b> 7200DIN 7250DIN t. t Seite 4! PORTANTE: page 6
8 Digit Timer	ATENCION: Primero lea la p ATTENZIONE: Leggere per p d Isolated High Voltage Input	bágina 8 prima la pagina 10. English Page 2
<b>8-stelliger Zeitzä</b> Schraubklemmenadapter 1:1- Schraubklemmenadapter (Op	hler - und Universal oto Koppler)	Deutsch Seite 4
<b>Compteur horair</b> chiffres Adaptateurs: bornier entrée tension	<b>e à 8 chiffres</b> à visser et optocoupleur pou	Français " Page 6
<b>Temporizador de</b> Adaptadores: bloque de term tensión aislada	<b>e 8 dígitos</b> ninales y entrada de alta	Español Página 8
<b>Timer ad 8 cifre</b> Adattatori: morsettiera e per slate	ingressi ad alta tensione	Italiano Pagina 10
Dimensions, Abmessungen,	Dimensiones, Dimensioni	Page 12 Seite 12

### Specification

### **Batteries**

Non-replaceable Lithium battery. 10 year expected life at 20°C

### Display

8 digit black LCD, 7mm characters

### Timing Range

See 'Timing Mode Selection'

Operating temperature -10°C to +60°C

### Storage temperature -20°C to +60°C

### Altitude

Up to 2000m

### **Relative Humidity**

80% max up to 31°C, decreasing to 50% max at 40°C

### Sealing

Front panel sealed to IP65 when used with clip mount and gasket provided.

WARNING THIS UNIT CONTAINS A LITHIUM BATTERY AND MUST NOT BE DISPOSED OF IN A FIRE OR EXPOSED TO TEMPERATURES BELOW -20 C OR ABOVE +70 C.

### Connections



### **Timing Mode Selection**

Select Timing Mode A or B as shown on the previous page.

	7500DIN	7510DIN
Α	Seconds (99999999)	Hours and Minutes (99999-59)
В	Minutes and Seconds (99999-59)	Hours and Hundredths (99999-99)

Rollover to 0.

### 7200DIN Terminal Block Adaptor



- For use with 7500/7510DIN only.
- Plug the adaptor directly into the connector at the rear of the 7500/7510DIN.
- Finger-proof screw connections for wires up to 2.5mm<sup>2</sup>.
- Overvoltage Category II, Pollution Degree 2 (IEC 64)
- Cut 7500/7510DIN pin 5 to change to Timing Mode A.

Mounting	Panel Cutout Size	Maximum Panel Thickness
using Built-in Fixing Clip	45.5 x 22.5mm (1.78 x 0.88")	7.5mm
using 50 x 25 Adaptor	50.3 x 25.3mm (1.98 x 0.99")	7.5mm
using Screw-Fixed Bezel	<= 48 x 33mm	

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I.



Installation Manual / User's Manual sprinkler Controllers by Orbit®

Manuel d'Installation / Manuel d'utilisation Programmateurs d'arrosage par Orbit®

Manual de Instalación / Manual del usuario controlatores para sistemas de aspersión Orbitº

Manuale d'installazione / Manuale d'uso Programmatore per Irrigazione Orbit® Installationshandbuch / Benutzerhandbuch Orbit® Controller für Bewässerungssysteme Manuel d'installation / Manuel d'utilisation Programmateurs d'arrosage par Orbit®





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Introduction\_

Thank you for selecting an Orbit<sup>®</sup> sprinkler controller. Orbit<sup>®</sup> designers have combined the simplicity of mechanical switches with the accuracy of digital electronics to give you a controller that is both easy to program and extremely versatile. The Orbit<sup>®</sup> controller provides convenience and flexibility, letting you run a fully automatic, semi-automatic, or a manual watering program for all your watering needs.

Please read this manual completely before you begin to program and use the controller. A few of the most notable design features include:

### At-a-Glance Simplicity

By turning the rotary dial to one of seven settings you can review programming or easily make changes.

### **Arm Chair Programmable**

By inserting two AA alkaline batteries you can program the controller prior to installing it in its permanent location.

# Automatic Electronic Circuit Breaker w/Fail Safe

An electronic circuit breaker protects the controller's power supply. If the circuit breaker trips, it will reset automatically. In most cases, there is no loss of data or watering cycles.

## Smart-Scan<sup>®</sup> Diagnostic Fault Sensing

A diagnostic fault sensor skips over any station that has a short in the solenoid or wiring. If the controller senses a short in a station, it skips the faulty station and moves on to the next programmed station. The controller displays FAULTY and identifies the faulty station number.

# Pump Start or Master Valve Connection

If a pump will be included in the sprinkler system, a terminal is provided to send a signal to the relay to activate the pump (note section on pump connection in the *Installation Manual*). This terminal will also activate a master valve.

### Language Overlays

Available in Spanish, French, Italian, German and English.

### 1. Digital Display

An extra large LCD (Liquid Crystal Display) shows the time of day and indi-

cates many of the programming settings. The display is completely interactive with all other controls.

### 2. Programming Buttons

The controller has seven push buttons for setup and program entry. Working in conjunction with the rotary dial, the buttons are used to set the time of day, watering time, watering days, start times, and other functions.

### **3. Duration Slide Switches**

The vertical slide switches set the number of minutes a station is on when the controller is operated in automatic mode. The slide switches also set any individual station to always on, always off, or on with duration when the controller is operated in manual mode.

### 4. Program Slide Switches

The program slide switches assign each station to one of three programs: Program A (14 day cycle), Program B (interval cycle), or Programs A and B combined.

### 5. Rotary Selector Dial

The heart of the controller is the rotary selector dial. This dial makes it easy to see which function is currently selected and/or in which mode the controller is set to operate.

### 6. Reset Button

The reset button clears all your programming but does not remove the factory installed fail-safe program. To prevent an accidental reset, the button is recessed into the panel and must be pressed with a small pointed object such as a pen or pencil tip.



**AGURE 1: Features of the Controller** 

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### Notable Programming Features Two Watering Programs—Summary

The controller gives you the option of using any or all of these independent programs. Note that each station can independently be set to either A or B or both A and B programs.

### Program A—Days

Any or all days in a two week schedule can be set to water. This program lets you schedule selected stations to water on specific days of the first and second weeks. At the end of the two weeks, Program A repeats continuously.

### Program B—Interval, Odd, Even

Provides two options: One for odd or even day watering and another for an interval ranging from every day to every 28th day. This feature is designed to meet the growing needs and restrictions imposed by local governments and to conserve water.

The controller automatically calculates odd and even days (by date) for each month and makes adjustments for leap years to provide true odd and even watering. An interval of "1" will water every day, an interval of "2" will water every other day, and so on.

### Program A+B-Combined

This setting allows the stations to water under a combination of the A and B programs. This feature is especially useful for new grass (for watering up to 8 times per day) and allows greater flexibility in scheduling watering. If both the A and B programs are scheduled to water on a specific day, the station will water multiple times per day.

### Start-Time Stacking

The controller has the intelligence to "stack" start times that might overlap. If you enter two or more start times that overlap (in the same or in different programs), the controller will not activate two stations at the same time. Instead, the controller activates the first program cycle and then activates the next program cycle(s) in sequence after the first program finishes its preset watering duration.

The controller will not stack to the next calendar day. This prevents the controller from violating an odd or even day watering schedule.

## Manual and Semi-Automatic Modes

The controller gives you a number of manual and semi-automatic modes for flexibility in watering. You can override the controller's automatic programming in a variety of ways.

### User-Selectable Rain Delay

Unique watering delay button cancels program for 24, 48, or 72 hours (user-selectable), then resumes automatically:



### Getting Started

Programming the controller can be accomplished in just a few basic steps. Before you begin programming, it is important to install the batteries, set the time of day and date, and determine a watering plan.

### Install the Batteries

The controller requires two AA alkaline batteries to keep the program in memory in case of AC power loss. In a typical installation, fully charged batteries should provide sufficient power for approximately one year of protection. Therefore, we recommend changing the batteries annually.

- Remove the battery cover by sliding it to the left.
- Insert two AA alkaline batteries into the battery compartment.
  - Return the battery cover to its closed position.

Weak or missing batteries can cause the time, date, and program to be erased after a power failure. If this happens, you will need to install fully charged batteries and reprogram the controller.

**Note:** Batteries alone will not operate the valves in your sprinkling system. The 24volt transformer must be plugged in and have power to operate your system normally

# Set the Time of Day and Date

If this is the first time the controller has been programmed, you should press the small recessed button labeled **RESET**. Pressing **RESET** does not affect the factory installed fail-safe program [See Figure 2].



FIGURE 2: Programming Keys

Do not press the **RESET** button again unless you want to completely remove all your programming.

- Turn the rotary dial to the SET TIME/DATE position.
- **12:00 AM** will appear in the display with three arrows pointing to the year, month, and day.
  - Press and hold the + button to advance the clock to the correct time of day. Use the - button to go in reverse [See Figure 3]. When the correct time of day is reached, press the ENTER button to lock in the time.

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To increase or decrease more rapidly, hold down either the + or - buttons until the display goes into rapid advance mode.

- A cursor will appear below the arrow for the year, month, and date when programming [See Figure 4].
  - Use the + and buttons to set the correct year, then press ENTER.
- Use the + and buttons to set the correct month, then press ENTER.
   Use the + and buttons to set the correct day of the week, then press ENTER.

The display will show the correct time and day of the week



FIGURE 3: LCD Display with Surrounding Information



FIGURE 4: LCD Display with Cursors Showing

After the time of day, date, and year are set, this procedure does not need to be entered again for any other programming.

To avoid accidental station activation, either turn the rotary switch to OFF or enter a installed fail-safe program will turn on each station every day for 10 minutes. Caution: If a watering schedule is not entered into the controller, the factory watering schedule.

# Determine a Watering Plan

To help you visualize how best to program the controller, it might be helpful to make a watering plan on paper. This will help you establish which days and times you want to water.

Use the sticker inside the controller door to help determine and record your watering plan

### Sample Watering Plan

watering plan sticker inside the door. Below is a sample watering plan for Before programming the controller, we suggest that you fill out the your reference



Briefly describe each station and its location.

2 In the A-Days Program column, circle the desired watering days.

start S Enter the cycle start time for Program A. Generally, only one cycle time is required for Program A.

G Enter the watering duration for each station assigned to Program A.

G In the B-Interval Program column, fill in the desired interval (1 to 28) or circle odd or even. Repeat steps 3-4 for the B-Interval Program.



The controller has three programs that control a variety of watering plans. Depending on your needs, you can use one or all programs.

## Enter the Watering Schedule in Any Order You have the option of entering your watering schedule in whatever order

You have the option of entering your watering schedule in whatever order you like. This feature makes it very easy to review and change your watering schedule. Your settings can be changed at any time—while you're setting up the initial schedule or even after years of operation.

# Start Times for Program A or B

**Note:** A cycle start time is the time of day that the program begins watering the first station, and all other programmed stations will then follow in sequence. There are not separate start times for each station. Cycle start times do not correspond to specific stations. If you enter more than one cycle start time, all stations programmed to operate will water again (in sequence).

The way you set the cycle start time is the same for all programs. To set the cycle start times for each program you will be using, do the following:

- Turn the rotary selector to set the **CVCLE START TIMES** position in the program that you want to set up. The display will show an **A** or **B** depending on which program you have selected. The display will show —— : —— and a blinking cursor will appear in **START 1** location [See Figure 5].
- Set the time you want to begin watering for cycle start time 1 using the + or - buttons, then press the ENTER button. For additional cycle start times, simply press NEXT to advance to the next cycle start time and repeat this procedure by using the + and - buttons to enter the time and then press ENTER. Generally, only one cycle start time is required for each program (A, B).



**Note:** You cannot set a cycle start time for each station. Stations can be assigned to either Program A or B or both A and B. Each program can have up to four cycle start times. Stations assigned to either program will turn on sequentially according to the cycle start times assigned. Generally only one cycle start time is required for each program (A, B).

### Program A Setup

Program A is a two-week daily schedule. Watering may be scheduled for each of the 14 days. After 14 days, the A program continues to repeat itself—there is no need to reselect the watering days. To set the watering days, [Note Figure 6]

- Set start times as outlined in the previous column (Start Times for Program A or B).
- Turn the rotary selector to **SET WATERING DAYS.** The cursor (—) will blink above the current day in the first week. Any or all days in the two-week schedule can be programmed to water.
- To program a day to water, press ENTER. An arrow will be displayed above programmed days and the cursor will move to the next day. To advance to a specific day, press NEXT. To clear a day, press NEXT until the cursor is above that day, then press CLEAR.



FIGURE 6: Program A Setup for Two-Week Schedule

### Program B Setup

Program B is used to water an interval from 1 to 28 or on odd or even days. An interval of 1 will water every day; an interval of 2 will water today and then every other day, etc. The odd or even schedule is based on the date. If the time of day and the date are set correctly, the controller will only water on even or odd days. If selected, the controller has leap-year compensation to ensure conformance to the odd or even schedule.

To set the watering interval,

- Set start times as outlined in the previous column (Start Times for Program A or B).
  - Turn the rotary selector to **SET WATERING INTERVAL**. The cursor will blink to the right of the word **INTERVAL** [Note Figure 7.]



## FIGURE 7: Program B Setup for Fixed Schedule

- When selecting an interval of days, press the + or buttons to the desired interval. (Example: If you want to water once every ten days, the interval will be set for 10.) To program the interval, press ENTER.
  - To select either odd or even day watering, press NEXT. This moves the cursor to the odd or even setting. Then press ENTER.

■ To clear a schedule, press the NEXT button to move the cursor to the schedule and then press CLEAR. To enter a new schedule, press the NEXT button to move to the desired schedule and then press ENTER.

Note: If an interval of "3" is entered today, the controller will water for the first time today and then again every third day.

Note: The controller will NOT water on the first day the program is entered or modified if the start time(s) have already passed.

# Program B Interval Countdown

If the interval watering selection is used for Program B, the controller displays display a number in the lower right corner labeled NEXT B DAY. For example, if the number of days until the next interval watering day. The controller will the display shows "1" as the next B day, the interval watering program will water tomorrow [See Figure 8]. A "0" indicates that the B program will water today.



FIGURE 8: Program B Interval Countdown

### Program Assignments for A or B Set Watering Durations and

The way you set the watering duration is the same for all programs. To set the duration for each program you will be using, do the following—

- Select the watering duration for the stations by sliding each switch to its desired time from 2 to 120 minutes.
- To skip a station, move the station's slide switch to the MANUAL OFF position at the bottom of the slide.
  - Set the program slide switch for each station that you want to assign to Program A or B or A and B [See Figure 9]





# Reviewing and Changing Your Program The Orbit<sup>®</sup> controller lets you easily review a complete watering plan.

the rotary selector to the CYCLE START TIMES position in Program A and check the times that have been entered. Using the NEXT button, you can advance For example, to review Program A watering cycle start times, simply turn through the schedule without fear of disturbing any programming. If you want to change the cycle start times, watering days, or watering intervals, simply follow the directions for that program modification.

selector back to AUTO if you want the controller to automatically follow your plan. After reviewing or changing a watering schedule, remember to turn the rotary

# Ready for Automatic Operation

matic mode. In automatic mode, each station will operate sequentially, start-After programming is complete, turn the rotary selector to AUTO [See Figure 10]. The controller is now fully programmed and ready to use in the autoing with Program A.



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The Orbit\* controller has the ability to override the automatic program without disturbing the preset program.

### **1. Manual Operation—Using Slide Switches** You can override the automatic program and operate the controller manually by using the watering duration slide switches [See Figure 11]. If a manual operation is started during an automatic program cycle, the automatic pro-

gram cycle will be cancelled.



- A. Manual On-One Station
- Turn the rotary selector to the AUTO position.



Turn on any individual station by moving that station's watering duration slide switch to the MANUAL ON position (fully up). The display blinks back and forth between the water drop and the time of day.

The rotary selector must stay in AUTO for this operation to take effect.

Only one station can be active at a time. The last station set to the MANUAL ON position will be active (watering).

When a station is turned on manually, the display will show **on** inside a water drop. The display also shows the number of the station that is activated **[See Figure 12]**.



FIGURE 12: Manual Operation Display

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# B. Manual Off—One Station or Multiple Stations

■ Turn off any individual station or stations by moving the watering duration slide switch to the MANUAL OFF position (fully down). [See Figure 13.]



Leave the rotary selector in the AUTO position for the MANUAL OFF to affect individual stations.

Turning the rotary selector to the **off** position will turn all stations and all programming off. This turns all watering off and is essentially used as a system shut down.

To resume automatic watering-

Turn the rotary selector to the AUTO position and make sure the duration slide switch or switches are set for the specific watering durations.

# C. Manual Timed Watering for One Station

You can set any single station to go on manually for a specific amount of time from 2 to 120 minutes. This is a two-step process using the watering duration slide switch.

■ First move the watering duration slide switch to the MANUAL ON (fully up) position, then back to any duration position. For example, if you want to water a specific station for 15 minutes, push the slide switch to the MANUAL ON position then back to the 15 minute position [See Figure 14.]



FIGURE 14: Manual Watering Station 1 Using the Slide Switch

If more than one station is set for manual duration, the controller will activate only the last station you set.

For example: You set station 2 to MANUAL ON for 30 minutes. Then you immediately set station 6 to MANUAL ON for 20 minutes. The controller will only activate station 6 for 20 minutes—your last input. [See Figure 15.].



### FIGURE 15: Manual Timed Watering

At the completion of the manual watering duration set on the slide switch, the controller reverts to the automatic mode. Watering can be turned off at any time by pushing the slide switch to **MANUAL DFF**. (Remember to push the slide switch back from **MANUAL DFF** to a duration if you are using this station in the automatic watering schedule.)

**Note:** If a manual operation is started during an automatic program cycle, the automatic program cycle will be cancelled.

## Semi-Automatic Mode

In addition to the manual modes previously discussed, the controller also lets you override the programmed watering schedule temporarily without adjusting the water duration slide switches.

By using the semi-automatic mode, you won't need to remember to return the duration slide switches to their normal positions.

### A. All Stations Cycle Once

This can be especially helpful if you happen to experience unusually warm weather and you want to have all stations activate one time for their normal duration as set on the slide switches.

To turn on all stations once in sequence (rotary selector in **AUTO**) press the **MANUAI** button once (a blinking **ALI** is displayed), and then press **ENTER**. [See Figure 16.]



FIGURE 16: Watering All Stations Once

The display will show the first station number that is activated and will count down the minutes assigned to the watering duration slide switch. All stations will activate once in sequence (except those that are set to the **MANU-AL OFF** position) for the durations set on the watering duration slide switches. Any station set to the **MANUAL OFF** position will not water.

**Note:** After **MANUAL** has been pushed, if **ENTER** is not pushed within 60 seconds, the display will return to the time of day.

- To interrupt or discontinue this cycle, press the CLEAR button once.
- At the completion of this function, the controller reverts back to your normal automatic watering plan.

**Note:** If a manual operation is started during an automatic program cycle, the automatic program will be cancelled.

# (All stations cycle once, A program only.)

 To activate each station assigned watering durations for the A program only, press the MANUAL button, followed by the NEXT button. This will select stations with assigned watering durations in the A program only. To initiate this semi-automatic watering, press ENTER.

# (All stations cycle once, B program only.)

To activate each station assigned watering durations for the B program only, press the MANUAL button followed by pressing the NEXT button two distinct times. This will select only those stations with assigned watering durations in the B program only. To initiate this semi-automatic watering, press ENTER.

# (All stations cycle once, AB program only.)

 To activate each station assigned watering durations for the AB program only, press the MANUAL button followed by pressing the NEXT button three distinct times. This will select only those stations with assigned watering durations in the AB program only. To initiate this semi-automatic watering, press ENTER.

**Note:** After the **MANUAL** button has been pushed, if a selection is not made within 60 seconds the display returns to the time of day.

 To halt or discontinue semi-automatic or manual watering, press the CLEAR button once. The controller will revert to your original automatic watering program.

### HSITONE

### Using the User-Selectable Rain Delay Mode To stop automatic watering for 24, 48, or 72 hours, use the RAIN DELAY mode button.

- hours, the controller will automatically return to its initial watering schedule. ■ With the rotary dial set to AUTO, press the RAIN DELAY button once. The controller will force a 24-hour interruption of all scheduled watering. After 24
  - To increase the rain delay to 48 or 72 hours, simply press the RAIN DELAY button again until the desired delay time is displayed. Press ENTER.
    - To cancel the rain delay mode, press CLEAR [See Figure 17].

(counting down) to the end of the accepted delay alternating with the current time and date. No other button besides CLEAR will be accepted while the controller is in Note: While in rain delay mode, the controller will display the remaining hours the rain delay mode



**FIGURE 17: Display Showing Rain Detay** 

# **Complete System Shut Down**

To shut the system down, turn the rotary dial to the OFF position. The controller remains programmed but will not water.

short in each station as part of each watering sequence. If the controller senseature will automatically scan for the presence of a faulty solenoid or wiring working station. The controller displays faulty and the faulty station number See Figure 18]. If a short is detected in the pump/master control valve terminal, a "P" is displayed under the station number and the watering cycle is discontinued. Only the last station detected as having a wiring short will be Smart-Scan® Diagnostic Fault Sensing A diagnostic fault sensor is built into the electronics of the controller. This es a short in a station, it will skip the faulty station and move to the next displayed to the controller.



At the next scheduled watering sequence, the controller will attempt to water

continue to water the station and the faulty message will be eliminated from the faulty station once more. If a short is not detected, the controller will the display.

in order to cancel the faulty message from the display:

- 1. First repair the short in the wiring or replace the faulty solenoid.
- Test the station by operating a manual watering sequence
- 3. If the short is not detected after a few seconds, the FAULTY message will be terminated.
  - 4. If the message continues, a short in the wiring still exists.

The FAULTY message can also be eliminated from the display by turning the rotary dial.

# Internal Auto-Resetting Electronic Circuit Breaker The controller is equipped with an internal electronic circuit breaker. Unlike

a mechanical circuit breaker, the internal circuit breaker has the advantages of being more temperature stable, having a higher degree of sensitivity, and ault sensing, the internal electronic circuit breaker adds real value to your esets automatically. In combination with the diagnostic

controller. The batteries will maintain program data in the event of a circuit breaker trip. We recommend that you replace the batteries annually The internal circuit breaker will "trip" whenever the controller receives a high current spike. This might occur in the following situations:

2. When the power supply has an electric spike 3. If a station has a wiring short. If lightning strikes nearby.

and activates the LCD. After a few moments, the controller will automatically the problem causing the current spike has stopped (lightning strike stopped, non-faulty station). If so, the electronic circuit breaker will reset itself. It is momentarily. The batteries will continue to store the program information power supply spike over, or the diagnostic fault sensor has switched to a Whenever one of these conditions occurs, the electronic circuit breaker may "trip" causing the station output from the controller to be halted retest the circuit to see if the condition has stopped. In most cases, **40T** necessary to reset the controller manually.

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### Installation of Indoor Mount Controller

Install the controller in 5 easy steps-

- 1. Choosing a Controller Location
  - 2. Mounting the Controller
    - 3. Installing the Batteries
- 4. Connecting the Transformer
- 5. Connecting Valve Wires to Controller

# 1. Choosing a Controller Location

- Select a location near a standard electrical outlet. Avoid using an outlet controlled by an On/Off switch.
- The controller should not be exposed to the weather or operate at temperatures below 14 degrees or above 113 degrees Fahrenheit (-10 degrees or above 45 degrees Celsius). Avoid direct sunlight.
  - Installation works best in a garage or protected area. The controller should not be mounted outdoors.

# 2. Mounting the Controller

- Screw a No. 8 screw at eye level leaving the screw head extended out from A mounting template is provided to assist you in mounting the controller.
  - the wall about 1/8" (3 mm). Use expanding anchors in plaster or masonry if necessary.
    - of the controller over the extended Slip the keyhole slot in the back SCTEW.
- each of the two holes at the bottom of Screw a No. 8 screw through the box into the wall See Figure 19].



### FIGURE 19: Mounting the Controller

## 3. Install the Batteries

memory in case of AC power loss. In a typical installation, fully charged batteries should provide sufficient power for approximately one year of protec-The controller requires two AA alkaline batteries to keep the program in tion. Therefore, we recommend changing the batteries annually.

- Remove the battery cover by sliding it to the left.
- Insert two AA alkaline batteries into the battery compartment.
  - Return the battery cover to its closed position.

Weak or missing batteries can cause the time, date, and program to be erased after a power failure. If this happens, you will need to install fully charged batteries and reprogram the controller.

volt transformer must be plugged in and have power to operate your system normally Note: Batteries alone will not operate the valves in your sprinkling system. The 24-

- from the transformer into each terminal. It doesn't matter which lead goes sure the transformer is not plugged in. Insert one of the two power leads 4. Connecting the Transformer
   With the cover off, find the two terminal holes labeled "24 VAC." Make into which terminal.
- removal. To do this, simply press upward on the tab located on top of the It may be necessary to open the terminal to allow for wire insertion or terminal [See Figure 8, Page 4]

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Warning: Do not link two or more controllers together with one transformer. Plug in the transformer [See Figure 20]. Slide the cover back on until it snaps.



FIGURE 20: Connecting Pump Start, Master Valve and Transformer

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All our Weather-resistant Indoor/Outdoor controllers can run at temperatures between 35 and 140 degrees Fahrenheit (0 to 60degrees Celsius). Storage temperature is -4 to 149F (-20 to 65C). Direct sunlight can easily increase temperatures inside the Controllers so chose a shaded location.

The controllers are weather-resistant to UL-50 and ETL® Listed, but should not be placed in areas where continuous water could cause damage

Caution: Do not open the Controller when it is raining.

leave at least 7ins (18cm) to the left of the controller box for the door to swing fo make installation easier the Controller has a removable door. Remember to open after installation.

Check the model number of your timer: various models are configured differently to meet mational requirements, look for the section covering the model number on your controller. The model number can be found on the back of the housing, together with other useful information. Models 57396, 57392, 57384, 57386, 57388, 57382 are for installation in Australia, New Zealand, and South Africa using the fit-

### Models 57606, 57012 ted line cord.

using the line cord fitted or permanent installation. You need to decide which type of installation you are going to use. Ensure that you have the appropriate electrical are for 110/117VAC operation and are suitable for either wall-hanging installation



FIGURE 22: Back of Timer Box FIGURE 21: Outdoor Timer, Showing Terminal Cover

power available at the location you intend to use. If used outdoors with the line cord, a suitable weatherproof power outlet must be available.

# Installation using the fitted line cord Use the mounting template provided to assist you in preparing the mount-

- ing location: choose a flat, clean surface.
  - Using the upper mark on the template, insert a No. 8 screw (included) at eye level leaving the screw head about 1/8th inch (3mm) out from the

wall. (Use expanding anchors in plaster or masonry if necessary).

- Slip the slotted keyhole in the back of the Controller over the extended upper Using the lower mark on the template, affix a No. 8 screw (included), again leaving the head protruding.
- screw and allow the lower screw to recess into the lower hole in order to pre-The line cord may now be inserted into the power outlet. vent the Controller from swinging. [See Fig. 22]
  - - Proceed to section 7.

# Installation using permanent wiring

- Before commencing to install the controller you must remove the fitted line cord and replace with the pigtail wires provided.
- Take off the terminal compartment cover by unscrewing the two screws and pulling the plastic cover forward. [See figure 21], this reveals the AC Power Cover [Figure 23].
- Remove the rubber weather plug from the hole in the center and unscrew the one fixing screw, pull the plastic cover forward to reveal the AC winng.
  - Use a punch to create a hole in the blind Bottom Mounting Hole on the back of the controller box [Figure 22: Bottom Mounting Hole]
- Loosen the screw on the cord restraint and the three screws on the terminal block and remove the line cord completely.
- the Earth terminal marked E. Ensure that the terminal screws and the strain relief and cross to the terminal block. Fasten the wires to the terminal block ensuring that the black wire is connected to the Live terminal marked L, the white wire is connected to the Neutral terminal marked N, and the green wire is connected to Feed the three wires of the pigtail through the exit nipple, under the strain relief. screw are all firmly tightened. Check that the wires are clear of any obstruction and will not be trapped by the AC Power Cover when it is replaced
  - Replace the AC Power Cover and screw tight, do not force into place, if resistance is met check that no wires are trapped

The Controller is now ready for permanent installation; follow all the instructions for the following models to complete the installation.

# Models 57344, 57346, 57348, 57342

All the above listed models are designed for permanent installation only. Local International Models 94024, 94026, 94028, 94022 building and electrical codes usually require that an approved electrical con-duit and electrical fittings be used to connect exterior wall-mounted equiprequirements of the National Electrical Code and other state and local codes. should be made by a licensed electrical contractor in accordance with the ment to AC power. Please check local codes. Any permanent connection

- Take off the terminal compartment cover of the controller by unscrewing the two screws and pulling the plastic cover forward. [Figure 21]. Remove the rubber weather plug from the screw hole
  - Use the mounting template provided to assist you in preparing the mounting location: choose a flat, clean surface.

 Using the upper mark on the template, insert a No. 8 screw (included) at eye level leaving the screw head about 1/8th inch (3mm) out from the wall

2

(Use expanding anchors in plaster or masonry if necessary).

- Slip the slotted keyhole in the back of the controller box over the extended screw [Figure 22]
- Push a No. 8 screw (included) through the Bottom Mounting Hole [Figure 22] in the controller box and tighten until the box is held firmly to the wall, but do not over-tighten.

power and the low voltage in their separate The Controller has separate compartments voltage outputs. You must keep the input for the AC line power input and the low places when wining the controller box.

The controller has a built in transformer that source. Check the back of the controller box should be made by a licensed electrical contractor in accordance with the requirements for power requirements. This connection of the National Electrical Code and other must be connected to an AC line voltage state and local codes.



## FIGURE 23: AC Wiring Using Junction Box

Wiring the AC input: Caution: do not connect the controller to one phase of a there-phase power system used by a pump or other electrical equipment.

Use this 1/2 inch (13mm) NPT nipple to connect the controller to a standard The controller has a nipple-mounted external power connection [Figure 23] electrical junction box that should be UL Listed (or equivalent) or comply with IEC or EN standards (or equivalent).

- safety lockout. Verify that the power has been turned off to the installation Turn off the AC power at the AC circuit breaker and apply an appropriate site using an AC voltmeter set for the correct measurement range
- Use power feed wire of 14 gauge (AWG) minimum with a temperature rat-ing of 155 degrees Fahrenheit (68 degrees Celsius) or higher.
- Install the conduit and associated fittings. Connect the AC electrical power wining to the source by following all the right codes and local standards.
- Connect the junction box (not included) to the NPT nipple [Figure 23].
- Connect the source power conduit to the entrance of the junction box, following all the appropriate codes.
- Connect the source wires to the wires extending from the controller.
- Take care to follow the correct color code. For USA: connect the Green for may be bare copper conductor rather than green wire. For Europe: Live is Ground, Black for Live, and White for Neutral. Often the source ground Brown and Neutral is Blue, there is no ground connection required. Be sure that all wires are connected to the proper source wire.
- Make sure all connections are made with code-approved insulated connectors.
- Be sure to place a weatherproof gasket and lid on the junction box.

11



### Starts & Master Valves Installing Valves, Pump

# 1. Wiring the Electric Valves

pipe and buried underground. Be careful to avoid burying the wires in locause WaterMaster $^{\bullet}$  sprinkler wire or 20 gauge (AWG) plastic jacketed thertions where they could be damaged by digging or trenching in the future. mostat wire to connect the controller to the valves. If the distance is over ground; however, for more protection wires can be pulled through PVC If the distance between the controller and valves is under 700' (210 m). 700' (210 m), use 16 gauge (AWG) wire. The wire can be buried in the



# FIGURE 23: Connecting Controller Wires to Valves

- Each valve has two wires. One wire is to be connected as the common. The common wires for all the valves can be connected together to one common wire going to the controller. The other valve wire is to be connected to the specific station wire that will control that valve [See Figure 23]
- tape. For additional protection to waterproof connections, a WaterMaster<sup>®</sup> All wires should be joined together using wire nuts, solder, and/or vinyl grease cap can be used.
  - To avoid electrical hazards, only one valve should be connected to each station.

# 2. Connecting Valve Wires to the Controller

- Remove the terminal compartment cover.
   Strip 1/4" (6 mm) of the plastic insulation off the end of each wire.
- Determine which valve you want to connect to which station. Connect
- each valve wire to its station terminal (labeled 1-12) by inserting the bare wire fully into the terminal.It may be necessary to open the terminal to allow for wire insertion or
- removal. To do this, simply press upward on the tab located on top of the terminal [See Figure 24].
  - Connect the common wire to the terminal labeled com [See Figure 24].



FIGURE 24: Connecting Valve Wires

**Note:** Only one wire can be installed into each terminal. If more than two common wires are used in your system, splice several together so only one wire runs into each of the **com** terminals. Protect the splice connection with a wire nut.

# **OTHER QUALITY PRODUCTS AND ACCESSORIES**

### Automatic Rain Shut-Off

For automatic rain shut-off, contact your Orbit<sup>®</sup> dealer to purchase an Orbit<sup>®</sup> Model 57091 (94060) automatic rain shut-off switch. The rain shut-off easily connects to the controller and prevents overwatering during rainy periods.

### Weather Resistant Controller Box

Allows outdoor installation of most brands of indoor mount controllers. UL® listed.

### **Automatic Valves**

Durable, non-corrosive plastic construction. Automatic valves are available in anti-siphon or straight valves with safe, low voltage.

### **Automatic Converters**

Durable non-corrosive plastic construction. Converts most brands of plastic or brass valves to automatic.

### Grease Caps

Protects low voltage wires from corrosion or shorts.

### Remote Control Transmitter and Receiver Control your sprinklers with the touch of a button up to 200' (60 m) from your sprin-

kler controller.



### TROUBLESHODTING

# **Possible Causes of Problems**

## One or more stations do not turn on:

Faulty solenoid.

2. Wire broken or not connected.

3. Flow control stem screwed down, shutting valve off.

4. Programming is incorrect.

# Stations turn on when they are not supposed to:

Water pressure is too high.
 More than one start time is programmed.

### **One station is stuck on and will not shut off:** 1. Faulty valve.

Particles of dirt or debris stuck in valve
 Valve diaphragm faulty.

All stations do not turn on:

## 1. Transformer defective or not connected.

2. Programming is incorrect.

3. Circuit breaker has been tripped.

### Controller will not power up:

1. Circuit breaker has been tripped.

2. Transformer not plugged into an operational AC outlet.

# Stations continue to turn on and off when they are not programmed to:

More than one start time is programmed with overlapping schedules.
 Excessive pressure.

### **Circuit breaker trips repeatedly:**

Short in wiring or solenoids

### Help

Before returning this controller to the store, contact Orbit<sup>®</sup> Technical Service at: 1-800-488-6156, 1-801-299-5555

### Listings

The controller is tested to UL-1951 (Models 57004, 57006, 57008, 57122) and UL-50 (Models 57606, 57012) standard and is ETL<sup> $\bullet$ </sup> listed. Appropriate international models are CSA<sup> $\bullet$ </sup> and CE<sup> $\bullet$ </sup> approved.

### **Trademark Notice**

Control Star<sup>®</sup>, WaterMaster<sup>®</sup>, and Smart-Scan<sup>®</sup> are registered trademarks of Orbit<sup>®</sup> Irrigation Products, Inc.

The information in this manual is primarily intended for the user who will establish a watering schedule and enter that schedule into the controller. This product is intended to be used as an automatic timer controller for activating 24 VAC irrigation valves, as described in this manual.

# **WaterMaster® by Orbit® Limited Two Year Warranty**

Orbit<sup>•</sup> Irrigation Products, Inc. warrants to its customers that its WaterMaster<sup>®</sup> products will be free from defects in materials and workmanship for a period of two years from the date of purchase. We will replace, free of charge, the defective part or parts found to be defective under normal use and service for a period of up to two years after purchase (proof of purchase required). We reserve the right to inspect the defective part prior to replacement. Orbit<sup>•</sup> Irrigation Products, Inc. will not be responsible for consequential or incidental cost or damage caused by the product failure. Orbit<sup>•</sup> liability under this warranty is limited solely to the replacement or repair of defective parts.

To exercise your warranty, return the unit to your dealer with a copy of the sales receipt.

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### 1-800-488-6156 1-801-299-5555 www.orbitonline.com

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Orbit<sup>®</sup> Irrigation Products Inc. 845 North Overland Rd. North Salt Lake, Utah 84054

57004-24 Rev D

### <u>Appendix E</u>

Groundwater Flow Map



### <u>Appendix F</u>

Groundwater Sampling Results

NAC CONSULTANTS, INC.

### Sid Harvey Industries, Inc. Valley Stream, New York

# Table 1 July 2006 Groundwater Sampling Results: On-Site Monitoring Wells Volatile Organic Compounds USEPA Method 8260

Well Identification	MW-2	-WM	35	W	16-2	MW-4		MM	S		MM	19-	MW-6D	VINCE DEC
Sample ID	MW-2	MW-3S	MW-3SDL	IE-WM	MW-3IDL	MW-4	MM	5	S-WM	DUP	19-MW	MW-6IDL	MW-6D	Groundwater
Dilution Factor	1:1	1:1	10:1	1:1	25:1	1:1	1:1	5:1	1:1	5:1	1:1	50:1	1:1	Standards (ppb)
Sampling Date	July 25, 2006	July 25,	2006	July 2.	5, 2006	July 27, 2006	July 25,	2006	July 25,	2006	July 25	, 2006	July 25, 2006	
PARAMETER - Jug/		のないないです。	No. of the second s	The state of the state	· · · · · · · · · · · · · · · · · · ·	And the second se				141 °			そうで、「日本語」のよう いま	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
Dichlorodifluoromethane	QN	Q	Ð	Q	QN	QN	QN	Q	£	Q	Ð	Ð	Ð	5.02
Chloromethane	Ð	£	Q	Ð	Ð	Ð	Ð	£	Ð	£	Q	£	Ð	
Vinyl Chloride	Ð	Ð	Q	Ð	£	Ð	Ð	£	Ð	£.	Q !		Ð,	2 602
Bromomethane	Ð	£	Ð	Ð	Ð	Ð	Ð	Ð	2 ¢	2 F	Q I			20.5
Chloroethane	2 ¢			Q		Q ș		29						5.02
1 7 4 5-Tetramethane										ĒĒ		2 E		
1.1-Dichloroethene		40		16.0	18.0 T	0.63 1	1 20	Ę	0.32 I	Q	22.0	20.0	0.70 J	5.02
Chlorodifluoromethane				CIN I	GN	CIN I	C CN	e e	Ð	Ð	£	£	Ð	•
Freon 113	Ð	2		Ð		R	2	Ð	Ð	Ð	Ð	£	Q	•
Acetone	21.0	Ð	Ð	Ð	£	Ð	Ð	Ð	Ð	QN	QN	QN	QN	50.0 \$
Carbon disulfide	Ð	£	Ð	Ð	Ð	Ð	£	Q	Ð	Q	QN	Ð	Ð	
p-Diethylbenzene	Q	£	Ð	QN	Ð	Ð	Ð	Q	Ð	QN	Q	Ð	Ð	50.0 5
tert-Butyl Methyl Ether (MTBE)	Ð	2.4	Q	1.5	Q	5.6	Ð	QN	Q	QN	Q	Q	Ð	10.0 \$
Methylene Chloride	Ð	1.5	QN	Ð	Ð	Ð	Ð	Q	Q	QN	QN	Ð	QN	5.02
trans-1,2-Dichloroethene	Ð	Ð	Q	Q	Q	Ð	Ð	Q	Q	QN	QN	Ð	Ð	5.02
	Q	£	Ð	Ð	Ð	Ð	Ð	Ð	Ð	QN	Ð	Ð	Ð	•
-Dichloroethane	0.63 J	29.0	24.0	<b>50.0</b> E	57.0	7.3	1.6	£	1.6	Ð	31.0 E	32.0	4.0	5.0 4
Methyl ethyl ketone (MEK)	Ð	£	£	£	£	Ð	Ð	Ð	Ð!				CN S	20.0
Carbon l'etrachloride	Ð.	Ð		Ê	Ð	Ð	Ð	Ð.		Q.	Q.	2		0.03
2,2-Dicnoropropane			CN .	Q		Q :		Q P	2¢	CN 4	CN (	Z		5.0.5
CIB-1, 2-LICINOTOCIDENE	2 ¢	0.11.0	1.2.6		E F	4.2	2 ș	2 ¢	2 ¢		CIN CIN			20.5
Chloroform													2 E	2.5
1 1 1-Trichloroethane	24.0	31 A F	040	140 F	470	UN UN		2 E	1 44 0	2 E	230 F	220	0.40 1	5.02
1.1-Dichloromonene	CIN CIN				Ē			Ę	C SCON		CIN I		QN	•
Benzene	0.42 J	0.85 J	Ę	E	G	Ę	e g	Ę	Ē	Ð	Ð	Ð	Ð	-
1,2-Dichloroethane	Ð	£	Ð	Ð	£	Ð	Ð	Ð	Ð	£	QN	Ð	AD N	0.6
Trichloroethene	Ð	0.66 J	Ð	2.6	QN	Ð	Ð	Ð	Ð	QN	2.1	Ð	<b>DN</b>	5.02
1,2-Dichloropropane	Ð	Ð	Q	Q	Ð	Ð	Q	Q	QN	Q	Q	Q	Q	
Dibromomethane	Ð	QN	QN	Ð	Ð	Ð	Q	Ð	Q	Q	QN	Q	Ð	5.02
Bromodichloromethane	Ð	Ð	Q	Q	Q	QN	Q	Ð	Ð	Ð	Q	Ð	Ð	*
Methyl isobutyl ketone (MIBK)	Ð	Ð	Ð	Ð	Q	0.47 J	Q	Ð	Ð	Ð	Ð	Ð	Ð	50.05
Toluene	6.6	0.49 J	£	6.0	7.5 J	Ð	0.63 J	Ð	0.52 J	£	3.8	3.9 J	Ê	5.0 2
Tans-1,3-L/Ichioropropene	Q.	Ð		Ð	Ð	Ð	Ð!	Ð	Ð	Q		2 P	2 ¢	0.4
1 2-Trichloroethane		ON ON												+
1 3_Dicklorowomane														203
Chlorodihromomethane														50.5
1.2-Dibromoethane	Ē							2 E			E	e E		
Sid Harvey Industries, Inc. Valley Stream, New York

Table 1 (continued) July 2006 Groundwater Sampling Results: On-Site Monitoring Wells Volatile Organic Compounds USEPA Method 3260

Well Identification	MW-2	MM	V-3S	MM	V-3I	MW-4		MM	7-5		M	V-6I	CO-WW	NVSDFC
Sample ID	MW-2	WW-3S	MW-3SDL	MW-3I	MW-3IDL	MW-4	MM	-5	MW-5	DUP	MW-6I	MW-6IDL	CI9-WM	Groundwater
Dilution Factor	1:1	1:1	10:1	1:1	25:1	1:1	1:1	5:1	1:1	5:1	1:1	50:1	1:1	Standards (ppb)
Sampling Date	July 25, 2006	July 25	5, 2006	July 25	5, 2006	July 27, 2006	July 25,	2006	July 25	, 2006	July 2:	5, 2006	July 25, 2006	
PARAMETER - HEA		A CONTRACT OF		A STATE REAL PROPERTY.	An Arrest and the second s		のないないのであるのであるという	「おいていい」の時代には、「いい」	「日本のない」のない				たいたいというないというである	
Tetrachloroethene	6.5	1.6	Ð	13.0	14.0 J	0.39 J	0.70 J	Ð	0.88 J	Ð	14.0	12.0	Q	5.02
Chlorobenzene	QN	QN	Ð	Ð	Q	Ð	Ð	Ð	Ð	Q	QN	Ð	Ð	5.02
1,1,1,2-Tetrachioroethane	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Q	Q	Ð	5.02
Ethyl Benzene	1.7	7.6	[ 6,9 ]	0.33 J	Ð	Ð	3.8	0.94 ]	4.8	5,5	0.38 J	Ð	Ð	5.02
mcp-Xylenes	6.8	21.0	20.0	0.80 J	Ð	₽	4	1.0	5.0	6,1	1.1	QN	Ð	5.02
o-Xylene	6.7	37.0 E	36.0	0.33 J	Ð	Ð	33.0 E	8.0	40.0 E	44.0	0.46 J	Ð	QN	5.0 2
Styrene	Ð	Ð	Ð	Q	Ð	Ð	£	£	£	Ð	QN	Q	QN	5.02
Bromoform	Ð	Ð	£	Ð	Ð	Ð	Ð	Ð	£	Ð	Q	Q	Ð	*
Isopropylbenzene	Ð	3.6	3.2 J	Ð	£	£	0.83 J	0.31 J	0.94 J	Ð	Q	Q	Q	5.02
1,1,2,2-Tetrachloroethane	Ð	Ð	Ð	Ð	Ð	£	Ð	Ð	Ð	Ð	Ð	QN	QN	5.02
1,2,3-Trichloropropane	Ð	₽	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Q	Q	Ð	0.04
Bromobenzene	Ð	Ð	Ð	£	Ð	Ð	Ð	£	£	Q	Ð	Ð	Ð	5.02
n-Propylbenzene	£	2.4	Ð	Ð	Ð	₽	1.0	Ð	1.3	1.6 J	Ð	Ð	Ð	5.0 2
2-Chiorotoluene	Q	Ð	Ð	Q	Ð	₽	Ð	Ð	£	Ð	Ð	Q	R	5.02
1.3.5-Trimethylbenzene	0.47 J	72.0 E	70.0	Ð	Ð	Ð	6.4	2.8	7.0	9.4	Q	QN	Ð	5.02
4-Chlorotoluene	Q	Q	Ð	Ð	Ð	Ð	Ð	Ð	Q	Ð	QN	QU .	Ð	5.0 2
text-Butylbenzene	Ð	1.1	Q	Ð	Ð	Ð	Ð	Ð	Ð	Ð	QN	Q	Ð	5.02
4-Trimethylbenzene	1.1	130 E	140	0.45 J	Ð	Ð	47.0 E	20.0	51.0 E	68.0	0.55 J	QN	Ð	5.02
see-Butylbenzene	Ð	3.3	3.1 J	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Q	QN	5.0 2
p-Isopropyltoluene	Ð	Q	Ð	Ð	Ð	Ð	3.9	Ð	5.3	7.5	Q	Q	Ð	5.0 *
1,3-Dichlorobenzene	Ð	Q	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Q	Q	Ð	3.0
1,4-Dichlorobenzene	Q	0.45 J	£	Ð	Ð	Ð	Ð	Ð	Ð	Ð	QN	Q	Q	3.0
n-Butylbenzene	Q	Q	Ð	Ð	Ð	Ð	Q	Q	Ð	Ð	QN	Q	Ð	5.0 2
1,2-Dichlorobenzene	R	2.5	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Q	QN	QN	Ð	3.0
1,2-Dibromo-3-Chloropropane	Ð	Ð	Ð	Ð	Ð	Ð	Q	Q	Ð	Ð	Q	Q	Ð	0.04
1,2,4-Trichlorobenzene	Ð	Q	Ð	Ð	Q	Ð	Ð	Ð	Q	Q	Q	QN	₽	5.02
Hexachlorobutadiene	Ð	Q	Ð	Ð	Ð	Ð	Q	QN	Q	QN	QN	QN	₽	0.5
Naphthalene	Ð	12.0	16.0	QN	Ð	Ð	35.0 E	14.0	31.0 E	55.0	ND	QN	Ð	10.0 5
1,2,3-Trichlorobenzene	Q	Q	Q	QN	Q	Ð	QN	QN	QN	Ð	QN	Q	Ð	5.02
Total VOCs	76.92	373.85	354.40	431.01	566.50	20.59	138.86	47.05	150.21	197.10	305.39	287.90	5.10	
Total TICs	73.00	462.00	0	0	0	1.90	474.00	0.00	538.00	0.00	0.00	0.00	0.00	
Notes:	1. ND - Not Detected													

(POC) - Principal Organic Contaminant
 \* - No groundwater standard for this compound
 4. Applies to the sum of cis- and trans-1,3-dichloropropene
 5. TAGM applicable but no groundwater standard
 J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.
 E - Data indicates the analyte's concentration exceeds the calibrated range of the instrument for that specific analyses.

Data Qulaifiers:

### Sid Harvey Industries, Inc. Valley Stream, New York

# Table 2 July 2006 Groundwater Sampling Results: On-Site Performance Monitoring Wells Volatile Organic Compounds USEPA Method 8260

	·								
				Sid Harvey Industries Valley Stream, New	, Inc. York				
		July 200	6 Groundwater San Volatile Org	Table 2 ipling Results: On-Si anic Compounds US	te Performance Mor EPA Method 8260	itoring Wells			
Well Identification	PMW-1	Md	W-2		PMW-3		Md	W-4	
Sample ID	PMW-1	MA	W-2	PMW-3	PMW-3 DL	PMW-3 DL2	PMW-4	PMW-4 DL	N YSDEC Groundwater
Dilution Factor	1:1	1:1	50:1	1:1	100:1	500:1	1:1	5:1	Standards (ppb)
Sampling Date	July 25, 2006	July 27, 2006	July 27, 2006		July 27, 2006		July 27, 2006	July 27, 2006	
PARAMETER - µg/l								ないないないないないないである	
Dichlorodifluoromethane	ZQN 2	Ê							- 0.C * 3
Vinut Chlorida								C I	2.0
Bromomethane					Ð	Ð	Ð	Ę	5.02
Chloroethane	Ð	£	Ð	4.0	QN	QN	5.0	QN	5.02
Trichlorofluoromethane	QN	QN	DN	QN	Q	QN	Q	Q	5.02
1,2,4,5-Tetramethylbenzene	Q	QN	Q	QN	Q	Q	QN	Q	*
1,1-Dichlorocthene	0.69 J	140 E	100	760 E	230	240 J	1.2	Ð	5.02
Chlorodifluoromethane	£,	Ê	Ð	Q \$	Ð,	Q P	Q Q		
Freon 113			ND 1100 D	<b>UN</b>				UN 110 B	\$0.03
Account n-Diethvlbenzene			ND ND			ND ND		a qu	50.0 5
tert-Butyl Methyl Ether (MTBE)	E	Ę	Ð	1.3	Ð	Ð	3.4	QN	10.0 \$
Methylene Chloride	QN	QN	QN	29 E	64 J	QN	QN	Q	5.02
trans-1,2-Dichloroethene	QN	QN	QN	QN	Q	QN	1.7	Q	5.02
p-Ethyltoluene	QN	Q	Q	Ð	Q	Ð	Ð	Ð	-
1,1-Dichloroethane	2.6	6.4	Ð	260 E	420	400 J	34.0 E	25.0	5.02
Methyl ethyl ketone (MEK) Carbon Terrachlorida						920 J	UN 13		5.0
2.2-Dichloropropane						Ð	Ð	Ð	5.02
cis-1,2-Dichloroethene	Ð	Ð	Ð	61.0 E	1 6L	QN	8.4	7.2	5.02
Bromochloromethane	Q	QN	QN	QN	Q	QN	Q	Q	5.02
Chloroform	Q	4.9	Ð	0.8 J	Q	QN	Ð	Q	7.0
1, 1, 1-Trichloroethane	1.9	<b>560</b> E	970	1,700 E	14,000 E	15,000	7.1	5.6	5.02
1,1-Dichloropropene				UN 1 0 0	120	0.90			-
Deutzeite 1 2-Dichloroethane				1.0					0.6
Trichloroethene	0.76 J	5.2		140 E	180	170 J	28.0	22.0	5.02
1,2-Dichloropropane	Q	Ð	Q	QN	QN	QN	QN	Q	1.0
Dibromomethane	ND	Q	Ð	Ð	Q	Ð	Q	Q	5.0 <sup>2</sup>
Bromodichloromethane	R	5.7	Ð	Q	Ð	Ð	Ð	Q	*
Methyl isobutyl ketone (MIBK)	Q	Ð	QN	<b>1.3</b> J	Ð	Ð	Ð	Q	50.05
Toluene	Ð	Ð	Ð	42.0 E	6 0 9	Ð	1.4		5.02
trans-1, 3-Dichloropropene	Ð	Ð	Ð	Ð	Q	£,			0.4 *
cis-1,3-Dichloropropene		Ê	Ð	Q		QN #			0.4*
1,1,2-1 fichloroethane		2 ¢		0.0 VIN		UN UN	2 E	D I	5 N <sup>2</sup>
Chlorodibromomethane								QN	5.02
1,2-Dibromoethane	Ð	2 Q	Ð	Q	QN	- QN	QN	QN	*

#### Sid Harvey Industries, Inc. Valley Stream, New York

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# Table 2 (continued) July 2006 Groundwater Sampling Results: On-Site Performance Monitoring Wells Volatile Organic Commonized 115EPA Method 8260

			v utaute Orga	nic comboning on					
Well Identification	PMW-1	PMd	N-2		PMW-3		PM	W-4	
Sample ID	PMW-1	PMd	N-2	PMW-3	PMW-3 DL	PMW-3 DL2	PMW-4	PMW-4 DL	NYSDEC
Dilution Factor	1:1	1:1	50:1	1:1	100:1	500:1	1:1	5:1	Croundwater Standards (nnh)
Sampling Date	July 25, 2006	July 27, 2006	July 27, 2006		July 27, 2006		July 27, 2006	July 27, 2006	
PARAMETER - Hg/l	Alexandre and a second s				このない たいのです このできるのです			の時間の時間のないのである	
Tetrachloroethene	2.7	18.0	18.0 J	100 E	160	QN	5.1	QN	5.02
Chlorobenzene	QN	Q	QN	QN	Q	QN	QN	QN	5.02
1,1,1,2-Tetrachloroethane	<b>D</b> N	QN	QN	Q	Ð	QN	QN	Q	5.02
Ethyl Benzene	QN	Q	Ð	0.63 J	Q	Q	1.1	QN	5.02
m&p-Xylenes	Ð	Ð	Ð	Q	Ð	QN	Ð	Ð	5.02
o-Xylene	<b>DN</b>	Q	QN	0.78 J	QN	Q	1.1	Ð	5.02
Styrene	ND	QN	QN	Q	Ð	QN N	Q	Ð	5.02
Bromoform	ND	ND	QN	QN	Ð	Q	Q	Q	+
Isopropylbenzene	Q	QN	Q	0.73 J	Q	Q	Q	Ð	5.02
1,1,2,2-Tetrachloroethane	QN	QN	QN	Q	Ð	Q	Q	Q	5.02
1.2.3-Trichloropropane	QN	QN	Ð	Ð	Q	Q	Q	Ð	0.04
Bromobenzene	QN	Ð	Ð	Ð	Ð	Q	Ð	Ð	5.02
n-Propylbenzene	QN	QN	QN	2.0	Q	QN	2.4	Q	5.02
2-Chiorotoluene	QN	QN	Ð	Ð	Ð	Q	Q	Ð	5.02
1,3,5-Trimethylbenzene	Ð	QN	Q	8.0	Q	QN	Q	Q	5.02
4-Chlorotoluene	QN	QN	Ð	Ð	Ð	Q	Ð	Ð	5.02
tert-Butylbenzene	QN	Ð	Ð	0.45 J	Q	Q	2.0	Ð	5.02
1,2,4-Trimethylbenzene	QN	QN	Ð	21.0 E	Ð	QN	5.6	Ð	5.02
sec-Butylbenzene	QN	QN	Ð	1.7	Ð	Q	11.0	8.2	5.02
<b>p-Isopropyltoluene</b>	Q	Q	Ð	1.5	Q	Q	1.8	Ð	5.0 3
1,3-Dichlorobenzene	Ð	QN	QN	QN	Q	Q	Q	Ð	3.0
1,4-Dichlorobenzene	Ð	0.34 J	Q	1.2	QN	Q	Q	Ð	3.0
n-Butylbenzene	Ð	QN	QN	1.9	QN	Ð	3.6	Q	5.02
1,2-Dichlorobenzene	Ð	QN	QN	1.5	QN	Ð	1.4	Ð	3.0
1,2-Dibromo-3-Chloropropane	Ð	QN	QN	QN	QN	QN	QN	Q	0.04
1,2,4-Trichlorobenzene	Ð	1.5	Q	2.0	Q	QN	QN	QN	5.02
Hexachlorobutadiene	Ð	Q	Ð	QN	QN	DN	ND	DN	0.5
Naphthalene	Q	1.2	Q	1.7	QN	DN	1.4 B	ND	10.0 3
1,2,3-Trichlorobenzene	Ð	0.63 J	Ð	0.38 J	Q	Ð	Ŋ	QN	5.02
Total VOCs	8.65	743.87	2,188.00	3,158.95	17,613.00	28,310.00	127.90	178.00	All and a state of the state of
Total TICs	0	0	0.00	12.00	0.00	0.00	116.20	0.00	
Notes:	<ol> <li>ND - Not Detected</li> <li>(POC) - Principal</li> <li>* - No groundwater</li> <li>4. Applies to the sum</li> <li>* TAGM sumificable to</li> </ol>	Crganic Contaminant Organic Contaminant t standard for this com of cis- and trans-1,3-d	pound ichloropropene						
Dete A-lois and	<ol> <li>Posto indicator the</li> </ol>			F	14	بيا فأستأل سماعه فالمسابع			
Uata Uulainers:	J - Lata indicates the j is an approximate vali	presence of a compount	nd that meets the iden	lification criteria.	ie result is less than th	e quantitation limit bu	it greater than zero. T	he concentration give	c
	E - Data indicates the	analyte's concentration	n exceeds the calibrate	ed range of the instru	ment for that specific	analyses.			
	D - MIRINE WAS ULTER	ICO ID IDE DIATIK SAUIPI	Ð						

JUTS INC.	NYSDEC Groundwater Standarda (ppb)		5.02	•	2.0	5.01	5.02		.0.0	•	50.0 3	\$0.03	10.01	5.01	.0.0	5.01	50.01	5.0	5.01	5.01	5 0 <sup>2</sup>		1.0	0.6	1.0	5.02	*0.05	5.01	0.4 *	0.4 4	502	5.02		
MIC CONSUL	NW-11 I : 1	July 27, 2006	Q	Ð		2 Q	Ð	Ð	2 2	Q	Ð		0.37 1	Ð		Ð	Ð		6.4	£	25	Ð	Ð	₽.	e e	Ð	Ê	22	Ð	Ð		Ð	·	
	01-WM MW-10 1 : 1	July 27, 2006	Q	1 97 0	2 9	28	Ð	Ð	2	Ð	Ð	2 5	2	£	2 5	5.0	Ð	22	0.57 ]	Ð		9	Ð	Ê	22	£	QN .		Ð	Ð	Ē	Ê		
	<u>06-WM</u> 06-WM	July 27, 2006	Q	Ð	29	20	Ð	Ð	2 2	Ð	Ð	2 2	2	Ð		£	Ð		QN	Ð		22	Ð	29	22	£	99	2 2	₽	£,	2 2	22		
	viw-91 DUP RE*	and a second second second second	QN	₽	29	29	Ð	₽!	2 2	QN	₽!		£	£	25	Ð	£!	2 5	Ð	9	ND 11	Ð	Ð	e e	22	£	29	22	₽	Ð	2 F	£		
	MW-91 DUP	90	QN	Ð	2 ¢	29	Ð	Ð	2 9	Q	ę.		Ð	Ð		Ð	£!		Q	Ð	ND 13	Q	Ð	Ê	22	Ð	Ð Ø		Ð	Ð		Ð		
	<u>MW-91 RE*</u>	July 27, 20	Q	Ð		22	Ð	₽!		Q	Ð		22	Ð	2 5	Ð	£!		Q	2	ON .	Q	Ð	Ê	22	£	£ £	2 2	Ð	Ð		Ð		
oring Wells 60	16-WW	and the second second	QX QX	Ð	99		Q	£!	2 2	Q	£.		Ð	Q		Ð	Ð		Ð	£	ND 12	Q	Ð	Ê	22	Ð	e	2 2	Ð	Ð		Ð		
strites, Inc. New York 3 u USEPA Method 82	AW-95 RE*		Q	£			Ð	Ð.		Ð	Ð		0.69 J	Ð		Ð	Ð		QN	Ð	UN 1 ILU	QN	Q	Ð		QN	99		Q	Ð		Ð		
Sid Harvey Ind Valley Stream, Table adwater Sampling Ru	S6-MW	July 27, 200	QN	Ð			QN	Ð		Ð	Ð		11	Q	Ê	Ð	Ð	Ð	Ð	Ð	UN 1 at e	Q	Ð	Ê		Ð	29		Ð	Ð		Q		
July 2006 Grou Volatil	MW-8D MW-8D 1 : 1	uly 26, 2006	QZ	Ð	2	29	Ð	Ð	2 £	Ð	Ð	2 2	22	Ð	Ê	Ð	Ð	22	Ð	Ð	2 5	Ð	Ð	99	2 2	Ð	Ê		Q	£		Ð		
	18-WM 18-WM	thy 26, 2006 h	Q	Ð			Ð	Ð		Ð	Q	22	10.0	Ð	99	Ð	Ð		0.86 ]	Ð		Ð	Q	9:		Ð	Ê		Q	Ð	2 2	e e		
	MW-8S MW-8S 1 : 1	ly 26, 2006 Ju	QN	Ð	2	2 F	Q	Ð	2 2	R	Ð		2 g	Ð	Ê	Ð	Ð	ÊÉ	Ð	Ð		2 2 2	16.0		2 g	Ê	£ !	UN I UN	Q.	Ð		Ð		
	<u>dr-ww</u> Мw-7D 1 : 1	ty 26, 2006 Ju	Ð	Ð	Ð !	2 £	Ð	Ð	2 2	Ð	Ð	Ê		£	22	Ð	Ð	ÊÉ	Ð	Ð		Ð	Ð	Ð Ø	2 g	Ð	Ð !	E E	Q	Ð		QN		
	<u>п-т-</u> 11-т- 11:1	Jy 26, 2006 Ju	Q	Ð	Ð	2 g	Ð	Ð	Ð	22	Ð	Ê	22	Ð	Ê	Ð	Ð	2 2	Ð	Ð		22	Q	Ð		Ð	9		Ð	Ð		e Q		
	1 : 1	Jy 26, 2006 Ji	ND <sup>2</sup>	Ð	2	22	Q	Ð		Ē	Ð		1	Ð		Ð	Ð	ÊÊ	Ð	Ð		Ð	Ð	23		Ð	Ð		Ð	Ð		Ę		
	Identification site ID ion Factor	aling Date	orodifluoromethane	romethane	Lillonde	octhane	lorofluoromethane	S-Tetramethylbenzene	Achloroethene odiffuoromethane	1113	one r	on disuitide	lutyl Methyl Ether (MTBE)	vlene Chloride	-1.2-Dichloroethene	Vichloroethane	vi ethyl ketone (MEK)	on l'etrachloride ichloromonane	2-Dichloroethene	ochloromethane	Trichloroethane	ichloropropene	ante	hchloroethane	chloropropane	momethane	dichloromethane	LI ISOULIY AROUND (MALLA)	1,3-Dichloropropene	3-Dichloropropene	chloropropane	vdibromomethane	· · ·	

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CONSULTANTS	
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#### Sid Harvey Industries, Inc. Valley Stream, New York

### Table 3 (continued) July 2006 Groundwater Sampling Results: Off-Site Monitoring Wells Volatile Organic Compounds USEPA Method 3269

Well Identification	SL-WW	MW-71	UT-WW	MW-8C	NW-81	MW-8D	NM	So.		M	16-7		CC-WW	MW-10	SII-WW	NVCDEC
Sample ID	ST-WM	IL-WW	dr-ww	MW-8S	IS-WW	Cla-WM	S6-WW	MW-95 RE	16-WW	MW-91 RE	MW-91 DUP	MW-91 DUP RE	Q6-WW	MW-10	II-WW	Gmundwater
Dilution Factor	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1.1	1:1	1:1	1:1	1:1	Standards (ppb)
Sampling Date	July 26, 2006	July 26, 2006	July 26. 2006	July 26, 2006	July 26, 2006	July 26, 2006	July 27	7, 2006		July 2	7, 2006		July 27, 2006	July 27, 2006	July 27, 2006	
PARAMETER - HEA	110日の の時代にはまた。1日	の方においたの時にあった。	「「「「ない」」を見ていた。			「「「「「「「「「「」」」」	State States					の方法のないではないです。	The second s	Alt An Change and A Constant	された 大学のないない	ST. GEN DATE
Tetrachloroethene	0.66 J	£	Ð	Ð	0.46 J	£	£	Ð	1.1	1.2	1.0	1.2	R	0.87 J	Ð	5.02
Chlorobenzene	Q	Ð	₽	Ð	0.67 J	Ð	Q	Ø	Ð	₽	Q	Ð	Q	Ð	₽	5.02
1,1,1,2-Tetrachloroethane	Ð	Ð	Ð	Ð	2	£	Ð	2	2	Ð	Ð	ę	Ð	Q	₽	5.02
Ethyl Benzene	₽	Ð	₽	1.8	£	Ð	Ð	Ð	£	2	Q	Ð	QN	Ð	₽	5.02
mccp-Xylenes	₽	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Ð	QN	Q	Ð	5.02
o-Xylene	₽	2	Ð	Ð	Ð	£	Ð	£	Ð	£	Ð	Ð	-QU	Q	Ð	5.02
Styrene	₽	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Ð	2	Ð	Ð	Q	2	Ð	5.02
Bromoform	£	£	Ð	Ð	Ð	Ð	Ð	Ð	Q	Q	Ð	Ð	2	R	Ð	•
Isopropylbenzene	Ð	Ð	Ð	0.47 J	£	£	Ð	Ð	£	Ð	Ð	Ð	₽	Ð	Ð	5.01
1,1,2,2-Tetrachloroethane	Ð	Ð	Ð	Ð	£	£	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Q	Ð	5.02
1,2,3-Trichloropropane	Ð	£	Ð	Ð	£	£	Ð	Ð	Ð	£	Q	Ð	₽	Ð	Ð	0.04
Bromobenzene	Ð	P	Ð	Ð	£	Ð	£	£	£	Ð	2	Ð	Ð	Q	Ð	5.02
n-Propylbenzene	£	£	Ð	0.45 J	£	£	£	Ð	Ð	ġ	Ð	Ð	Ð	R	Q	5.02
2-Chlorotoluene	₽	2	Ð	Ð	Ð	Ð	Ð	Ð	£	Ð	QN	£	Ð	Q	Ð	5.02
1,3,5-Trimethylbenzene	Ð	£	Ð	£	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Q	Ð	Ð	Ð	5.02
4-Chlorotohuene	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Ð	QN	Q	Ð	Ð	Ð	Ð	Q	5.02
tert-Butylbenzene	Ð	£	Ð	Ð	Ð	Ð	Ð	₽	Ð	Ð	Ð	Ð	Ð	QN	Ð	5.02
1,2,4-Trimethylbenzene	Ð	£	Ð	3.2	Ð	£	Ð	Ð	Q	Ð	Q	Ð	Ð	Ð	Q	5.02
sec-Butylbenzene	£	Ð	₽	Ð	Ð	£	Ð	Ð	Q	Ð	Q	QN	Ð	Q	Ð	5.02
p-Isopropyltoluene	Ð	Ð	Ð	Ð	£	Ð	Ð	Ð	Ð	Ð	Q	Q	Ð	Q	Ð	5.03
1.3-Dichlorobenzene	Q	Ð	Ð	Ð	Q	2	Ð	Ð	QN	QN	Q	Ð	Ð	Ð	ę	3.0
1,4-Dichlorobenzene	Ð	£	Ð	Ð	Ð	£	Ð	Ð	Ð	Ð	Ð	Q	Ð	Q	ę	3.0
h-Butylbenzene	Q	QN	Ð	Ð	Ð	Ð	Ð	Ð	CN N	R	Ð	Ð	Ð	Ð	Ð	5.02
1,2-Dichlorobenzene	Ð	Ê	Ð	Ð	Ð	Ð	Ð	Ð	ę	Ð	QN	Ð	Ð	Ð	Q	3.0
1,2-Dibromo-3-Chloropropane	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Ð	Q	Ð	Q	Ð	Ð	Ð	Ð	0.04
1,2,4-Trichlorobenzene	Q	£	£	Ð	£	Ð	Ð	Ð	Ð	Ð	Q	Ð	Ð	Q	Ð	5.02
Hexachlorobutadiene	QN	Ð	Ð	Ð	g	Ð	Ð	₽	Ð	Ð	Q	Ð	Ð	Ð	Ð	0.5
Naphthalene	Ð	Ð	Ð	1.3	Ð	₽	1.1	1.1 B	QN	Q	Ð	Ð	Ð	Q	Ð	10.0 %
1,2,3-Trichlorobenzene	R	Q	Ð	Q	Q	Q	QN	Ð	QN	Ð	Ð	Ð	Ð	Ð	Ð	5.02
Total VOCs	8.26	0.00	0.00	23.52	13.71	0.00	2.58	2.10	2.30	2.20	2.30	2.30	0	9.11	16.04	
Total TICs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8	2.06	0.00	
Notes:	1. ND - Not Detected															

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POC: Principal Organic Contaminant
 POC Sprincipal Organic Contaminant
 POS groundwater standard for this compound
 Applies to the sum of cis- and trans-1,3-dichloropropene
 TAGM applies to the sum of cis- and trans-1,3-dichloropropene
 TAGM applies to the sum of cis- and trans-1,3-dichloropropene
 TAGM applies to presence of a compound
 Laboratory reanalysis
 Laboratory reanalysis

Data Qulaifiers: