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SITE MANAGEMENT PLAN
LYNDONVILLE WEST AVENUE SITE
LYNDONVILLE, NEW YORK

Date: April 2005

Project No: 507619
18984401

CORPORATE REMEDIATION GROUP
An Alliance between
DuPont and URS Diamond

Barley Mill Plaza, Building 27
Wilmington, Delaware 19805

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April 22, 2005

Mr. David Pratt
Environmental Engineer
NYSDEC
6274 East Avon-Lima Road
Avon, NY 14414

SITE MANAGEMENT PLAN
LYNDONVILLE WEST AVENUE SITE, LYNDONVILLE, NEW YORK

Dear Mr. Pratt:

As you requested in your letter dated February 23, 2005, please find enclosed four copies of the Site Management Plan (SMP) for Lyndonville West Avenue, Site # 837002 Lyndonville, Orleans County, New York, for your review.

If you have any questions, please contact me at (302) 992-6771.

Sincerely,

Robert B. Genau
Sr. Project Leader
DuPont Corporate Remediation Group

Enclosure: Lyndonville Site Management Plan

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TABLE OF CONTENTS

FIGURES

APPENDICES

FIGURES

APPENDICES

1.0 INTRODUCTION AND PURPOSE

1.1 Overview and Objectives

The Lyndonville West Avenue site (the site) consists of several properties in the northwestern portion of the Village of Lyndonville, New York. The locations of the properties and portions of the properties subject to the requirements of this Site Management Plan (SMP) are shown in Figure 1-1. A large portion of the site is currently owned by H.H. Dobbins, Inc. (Dobbins), which currently operates a fruit cold storage and packaging facility. The site has been characterized during several previous investigations, which are summarized in Section 2.0 of this plan. Based on the results of the previous investigations, there are three areas of concern: the drainage swale, which runs east/west along the former railroad bed south of the Dobbins property; the landfill located on the Dobbins property, with an areal extent of approximately two acres; and leachate from the landfill. A remedy to address the three areas of concern at this site has been selected and approved by the New York State Department of Conservation (NYSDEC) and consists of the following:

- An asphalt cap (and soil cap for the minor north slope portion) and geosynthetic barrier layer (geomembrane) for the landfill
- Removal of soil in the drainage swale
- Continued operation of the leachate collection and disposal system
- Site fencing along the north slope of the landfill
- Site access and deed restrictions

The objectives of this SMP are to establish the provisions for the responsibilities of DuPont and the property owners, site access and security, environmental easements, cap maintenance, leachate system operation and maintenance (O&M), and ditch maintenance during the post-construction O&M phase of the remedial action.

1.2 Site History

Activities at the Lyndonville West Avenue site date back to the early 1900s with the development of fruit storage and processing facilities and construction of the Rome, Watertown, and Ogdensburg (RW&O) railroad. Industrial activities on the properties date back prior to the mid-1920s (Bel Adhesive Inc. and the Housel Packing Company). Barry Lime and Sulphur Company, Inc. began operations at the property in the early 1920s with the production of lime and sulfur solutions and dust mixtures. DuPont purchased Barry Lime and Sulphur in 1943 and continued with the formulation of agricultural sprays and dusts until approximately 1954.

Waste lime and sulfur sludge from Barry Lime and Sulphur Company and DuPont were disposed in a landfill, which is now part of the property currently owned by Dobbins. At the time the landfill was created, the property was owned by Lyndonville Ice and Cold Storage. It has also been alleged that the landfill was used by other local facilities for the

disposal of rotting fruit and by-products of fruit processing operations. As stated above, a large portion of the site is currently used for fruit cold storage and packaging [DuPont Corporate Remediation Group (CRG), 2003].

2.0 PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Chronology

2.1.1 Previous Investigations

Numerous investigations were conducted by various regulatory agencies between 1978 and 1993. For the most part, these investigations focused on collecting soil, surface-water, and stormwater samples within the stormwater drainage system for the greater West Avenue area (see Figure 2-1). The site was reclassified from a class "2A" to a class "2" site on the New York State (NYS) Registry in March 1994. Notifications requesting site investigation were distributed in 1995 to Primary Responsible Parties (PRPs) including Monroe Electronics, Dobbins Ramage, Bowman Apple Products Company, and DuPont. DuPont was the only PRP to respond to the notifications.

Scopes of work for both a Supplemental Environmental Assessment (SEA) and Supplemental Remedial Investigation (SRI) were negotiated and implemented by DuPont. DuPont conducted the SEA in 1997 to identify the source of the odors along West Avenue and characterize the site. Findings of the SEA revealed that the largest contributor to nuisance sulfur odors along West Avenue was leachate generated from the landfill, which discharged to the West Avenue storm sewer.

In 2001, a SRI was implemented and completed by DuPont. The SRI focused on the collection of data to evaluate remedial alternatives for the site and to address areas not characterized during previous investigations. The SRI report was approved by the NYSDEC in November 2001.

In September 2003, a revised Focused Feasibility Study (FFS) was completed by DuPont. The purpose of the FFS was to evaluate and recommend selected remedial action alternatives for the Lyndonville West Avenue site. The FFS was approved by the NYSDEC in the Record of Decision (ROD).

2.1.2 Previous Remedial Actions

The remedial actions implemented by DuPont and the Town of Lyndonville included the following:

- Installing a junction box for leachate from the landfill
- Diverting stormwater flow upgradient of the landfill
- Collecting leachate for off-site disposal

In 1999, DuPont installed a sewer junction box that connected the 18-inch storm sewer underneath the landfill and a 6-inch polyvinyl chloride (PVC) sewer lateral pipe to the industrial sewer. This junction box eliminated the remaining open ditch section connecting the 18-inch and 6-inch sewer lines.

In 2000, the Town of Lyndonville (with funding by DuPont) installed a stormwater diversion system upgradient of the landfill. This system eliminated a major source of stormwater from entering the landfill. Stormwater was diverted around the landfill by grouting the box culvert and installing a new storm sewer pipe within the drainage swale. The stormwater from the new pipe, which no longer comes in contact with landfill material, is discharged to the Main Street storm sewer system.

In 2001, as part of the leachate collection system construction project, the 18-inch storm line from the landfill was connected to a new manhole. The 18-inch connection to the junction box was then grouted to eliminate discharge of leachate to the West Avenue storm sewer system. The junction box continues to serve as a collection point of storm drainage from the adjacent residential properties.

In 2001, an additional remedial action was installed to eliminate discharge of the leachate to the West Avenue storm sewer. The primary components of the leachate collection system are a leachate collection manhole and leachate storage tank (see Figure 2-2). The existing storm sewer line underneath the landfill is connected to the leachate collection manhole. The storm sewer line downgradient of the new manhole was grouted to prevent any leachate from entering the West Avenue storm sewer system. Leachate is pumped from the new manhole to an aboveground leachate storage tank. The leachate storage tank vent is equipped with carbon canisters to remove sulfide odors. The leachate is pumped into a tanker truck and transported to the Publicly-owned Treatment Works (POTW) in Niagara Falls, New York for treatment and disposal.

2.2 Nature and Extent of Contamination

Based on the results of the 1997 SEA, performed by DuPont, the report conclusions included the following:

- The drainage swale along the former railroad bed contained soils with concentrations of DDT, DDD, DDE and arsenic above New York Technical and Administrative Guidance Memorandum (TAGM) #4046 guidance criteria.
- Arsenic and copper were detected at uniform concentrations [approximately 300 milligrams per kilogram (mg/kg) for arsenic and 400 mg/kg for copper] within lime-dominated fill materials in the landfill. Pesticides were either not detected or were detected at very low concentrations in composite samples of the lime fill material. Deep samples collected at all soil boring locations indicated that downward migration of contaminants had not occurred. Toxicity Characteristic Leaching Potential (TCLP) results for composite lime fill samples were below toxicity characteristic regulatory levels. As such, the lime fill materials are not a characteristic hazardous waste.
- The presence of pesticides and metals in background surface-water samples suggests that there may be other contributing factors in the area, including the historic and widespread use of pesticides and metals for agricultural purposes.
- Lime fill materials disposed in the landfill are a possible source for the observed hydrogen sulfide gas occurrences; other fill materials disposed in the landfill may also be potential sources.

- Analytical results for groundwater samples did not indicate that groundwater has been impacted by any site-related activities at the former DuPont facility or the landfill (CRG, 1998).

For the 2001 SRI, performed by DuPont, the report conclusions included the following:

- Arsenic concentrations above background exist in the drainage swale between Monroe Electronics and the former box culvert south of the Dobbins facility. Arsenic concentrations generally decrease with increasing depth.
- Sediment at the terminus of the West Avenue industrial sewer has not been impacted above background levels by upgradient soil/sediment sources in the swale or by leachate that was produced by the landfill and discharged to the storm sewer before the leachate collection system was installed.
- Groundwater data obtained from a temporary monitoring well indicate that site-specific constituents are below groundwater standards near the swale and that groundwater does not appear to be a migration pathway for arsenic originating from the swale sediment.
- Former site operations or current soil conditions have not impacted groundwater (CRG, 2001).

3.0 CONTEMPLATED USE

Plans are for Dobbins to continue operations as a fruit cold storage and packaging facility. The drainage swale property owner has expressed an interest in using the eastern portion of the drainage swale for future storage operations. No other future changes in property use have been identified at this time.

4.0 SUMMARY OF REMEDY

4.1 Remedy Implementation/Long-Term Maintenance

The primary areas of concern identified, based on previous investigations discussed in Section 2.0 of this plan, consist of soil in the drainage swale, soil and waste in the landfill, and leachate from the landfill. For soil in the drainage swale and landfill, arsenic, DDT, DDD, and DDE were identified as constituents of potential concern (COPCs) during historical investigations of the site (prior to investigations conducted by DuPont). However, remedial actions to address arsenic in these areas will also address the DDT, DDD, and DDE.

For the landfill leachate, specific contaminant cleanup criteria were not established because the primary exposure pathway has been eliminated through previous remedial actions. However, a qualitative Remedial Action Objective (RAO) was established for leachate, primarily to prevent future migration and exposure to leachate.

Based on these considerations, the specific RAOs for the site are as follows:

- Prevent or reduce the potential for human exposure by direct contact to soil within the drainage swale and landfill material.
- Prevent or reduce the potential for erosion and migration of drainage swale soil and landfill material.
- Prevent or reduce the potential for off-site migration of and exposure to landfill leachate.

To achieve the RAOs for this site, the following NYSDEC-approved actions will be implemented:

- An asphalt cap (and soil cap for the minor north slope portion) and geosynthetic barrier layer (geomembrane) for the landfill
- Removal of soil in the drainage swale
- Continued operation of the leachate collection and disposal system
- Site fencing along the north slope of the landfill
- Site access and deed restrictions

These actions are described in the September 2004 Cap Design, Lyndonville West Avenue Site, Lyndonville, New York, prepared by DuPont (CRG, 2004b). Remedy implementation is further discussed in the subsections below.

4.1.1 Soil Characterization

The drainage swale soil to be excavated and transported to an approved disposal facility was characterized during the SEA and SRI. Also, in response to NYSDEC comments on the April 12, 2002 FFS, DuPont collected an additional 95 soil samples in and around the drainage swale to horizontally and vertically delineate arsenic in the swale.

To characterize the soil for disposal purposes, DuPont collected three soil samples in accordance with the Waste Management Plan (see Appendix C) from the drainage swale. A NYSDEC-approved laboratory analyzed the soil samples for TCLP metals [United States Environmental Protection Agency (EPA) Methods 7470A and 6010B], pesticides (EPA Method 8081A), and herbicides (EPA Method 8151A). None of the results had detections above the regulatory limits. Based on the results, the soils to be excavated are non-hazardous. In a letter dated April 5, 2005, approval was granted by EPA and NYSDEC for the excavated soil to be transported to the DuPont Necco Park Landfill, located in Niagara Falls, New York, for use as alternate grading materials (AGMs). A copy of the letter is included in Appendix A.

4.1.2 Cover System

The landfill portion of the site will be capped. The proposed cap system has been developed to facilitate the ongoing industrial use of the property subsequent to construction. For the operational area of the existing Dobbins juice processing facility, the cap shall incorporate geosynthetic components and a paved final surface. The cap system cross-section for the asphalt cap consists of the following components from bottom to top.

- Prepared subgrade
- 60-mil geomembrane
- Geotextile Cushion
- 5 ½-inch New York Department of Transportation (NYDOT) Type 2 Aggregate subbase
- 5-inch NYDOT Type 1 Hot Mix Asphalt (HMA)
- 1 ½-inch NYDOT Type7 HMA

The cap will also contain two vents located along the western boundary of the landfill in areas of elevated topography.

The cap system cross-section for the engineered soil cap consists of the following components from bottom to top.

- Prepared subgrade
- 60-mil geomembrane
- Geocomposite Drainage Layer
- 6-inch cover soil layer
- 6-inch amended cover soil layer

The proposed asphalt cap and soil cap consists of geosynthetic and asphaltic concrete paving or natural soil components and was designed to meet NYSDEC requirements while serving to protect the environment. Geosynthetic components were selected because of the performance advantages they offer relative to natural earthen materials (i.e., tensile strength, drainage capacity, long-term impermeability, etc.). In addition, geosynthetic materials are more readily installed and repaired.

4.1.3 Erosion Control

Erosion control procedures to be implemented during the construction phase of the remedial action are addressed in the Cap Design Report (CRG, 2004b). Post-construction erosion controls will be implemented for the drainage swale and the landfill. Following removal of existing vegetation and site-contaminated soil, the drainage swale will be restored with backfilled soil and will be re-seeded with a mix of natural vegetation. During the first growing season following excavation, the drainage swale will be inspected monthly until vegetation is established that will minimize water and wind erosion.

With the engineered soil cap in the northern portion of the landfill, the cover soil and amended cover soil will function to sustain vegetative growth. A good vegetative stand will minimize water and wind erosion and increase evapotranspiration, which will serve to minimize infiltration. The remainder of the landfill will be paved with an asphalt cap. Monthly inspections of the cap will be performed, when allowed by weather conditions, for settling. Settlement associated with volume reduction due to compressible waste materials is expected to be minimal at the site. The landfill area has been utilized by the existing owner for a period of years (including frequent truck traffic) with no observable impact from settlement. Repairs will be made to the cap system when settlement either has exceeded an acceptable depth (i.e., impact to asphalt cap) or shows visible signs of failure. Asphalt cap maintenance will be performed on an as-needed basis.

Additionally, the final grading plan was developed to facilitate the diversion of stormwater off of the cap system. Grading will promote stormwater diversion in general conformance with drainage patterns currently present at the site. The proposed stormwater management system has been designed to accommodate a 25-year, 24-hour storm for culverts and a 10-year, 24-hour storm for drainage ditches, thereby minimizing the potential for erosion.

4.1.4 Institutional Controls

With the removal of the contaminated soil in the drainage swale, no deed restrictions are required for the drainage swale. As for the landfill, deed restrictions will include maintaining the commercial use designation for the property and prohibiting future residential use of the property. Site activities within the landfill, such as excavation, will be restricted unless specific personal protective equipment and other safety measures are in place. For access control, the installation of a fence along the northern slope of the landfill will reduce the potential for trespasser exposure to COPCs.

4.1.5 Maintenance

Maintenance activities for the landfill cap, leachate collection system, and drainage swale are discussed in Section 5.0 of this SMP.

4.2 Health and Safety

To address health and safety issues, DuPont has prepared a site-specific health and safety plan (HASP) that meets the DuPont requirements and the Occupational Safety and Health Administration's (OSHA's) requirements (CRG, 2004a). NYSDEC approved the HASP in a letter dated February 25, 2005 (see Appendix A).

5.0 OPERATION, MONITORING, AND MAINTENANCE WORK PLAN

An Operation, Monitoring, and Maintenance (OM&M) Work Plan has been prepared for the site and is provided in the following subsections. The OM&M Work Plan addresses DuPont and owner responsibilities, site access and security, environmental easements, cap maintenance, leachate system O&M, and ditch maintenance.

5.1 DuPont Responsibilities

DuPont is responsible for site remediation and maintenance of the remedy. After construction completion, DuPont will be responsible for maintaining the landfill cap, operating and maintaining the leachate collection system, and implementing contingency plans for odor control from landfill cap vents and landfill cap expansion, if necessary.

5.1.1 DuPont/URS Project Team

To assist in OM&M of the remedial action, DuPont has contracted URS Diamond (a division of URS Corporation) as the Project Manager (PM). The following lists the Project Team members by name, organization, and title:

- Mr. Robert Genau, DuPont Project Director. Mr. Genau has overall responsibility for the site and is the primary point of contact for DuPont in communications with the NYSDEC representative.
- Mr. Russell Killebrew, URS Diamond Construction PM. Mr. Killebrew is responsible for construction and OM&M of the remedial action.
- Mr. Timothy Pezzino, URS Diamond Operations Manager. Mr. Pezzino is responsible for the leachate collection system operations.
- Mr. Gerald Shepard, URS Diamond O&M System Operator. Mr. Shepard performs the periodic operations and maintenance of the leachate collection system, including the carbon vent system.
- Mr. Ed Lutz, DuPont Construction Manager. Mr. Lutz is responsible for construction activities.
- Mr. David Wooten (subject to change), URS Diamond DuPont Site Representative (DSR). The DSR is on-site during the construction phase and is responsible for monitoring the construction contractor and documenting construction activities.

5.1.2 NYSDEC Project Personnel and OM&M Contractors

The current NYSDEC, Division of Environmental Remediation, Region 8 representative for this project is Mr. David Pratt, P.E.

OM&M contractors will consist of licensed waste haulers equipped with a vacuum tanker truck to collect the accumulated landfill leachate. The leachate will be transported to the Niagara Falls POTW for disposal. As needed, an asphalt repair company will be contracted to repair the asphalt portion of the landfill cap. Other specialty contractors (electricians, pump repair/replacement) will be obtained on an as-needed basis.

5.2 Owner's Responsibilities

The property owner will be responsible for notifying DuPont of any future construction type activities with the potential to impact the landfill cap and/or leachate collection system. This includes any building demolition activities that could impact the size of the landfill cap. The current or future property owner will also be responsible for implementing and maintaining institutional controls and enforcement of the deed and land restrictions. This requires legal restrictions within the existing deed and any future deeds for the property.

5.3 Site Access and Security

During work hours, the construction contractor will require employees and visitors to sign-in and sign-out of the site. During non-working hours, the contractor will be responsible for securing their equipment. The remedial action includes the installation of a chain-link fence along the northern portion of the landfill cap to restrict access to potential trespassers.

5.4 Environmental Easement

H.H. Dobbins, Inc., the owner, has agreed to place an environmental easement on the property.

5.5 Cap Maintenance

5.5.1 Inspection/Repair

Visual inspections will be conducted on a monthly basis, primarily during the spring, summer, and fall. Inspections will be conducted during the winter months pending the absence of accumulated snow. Repairs to the cap will be made on an as-needed basis. Anticipated repairs will consist of cracks in the asphalt and settlement.

5.5.2 Contingencies

Two types of contingencies may arise for this project:

- Odors emanating from the two cap vents
- Cap expansion due to the demolition of existing site buildings

Should sulfide odors become evident from the landfill cap vents, the vents will be fitted with carbon canisters similar to the carbon canister used in conjunction with the leachate

collection system. The leachate collection system is equipped with a 55-gallon drum containing CENTAUR HSV catalytic activated carbon supplied by the Calgon Carbon Corporation. The canisters will be replaced and returned to Calgon when the carbon is expended. Calgon has a recycling program for their used canisters. The leachate collection system is further discussed in Section 5.6 of this SMP.

The area to be capped does contain Dobbins' juice building. Should future plans include the demolition of the juice building, two options will be evaluated:

- Extend the existing cap over the newly exposed landfill.
- If the building is constructed with a concrete slab, leave the concrete slab in place, thereby capping that portion of the landfill.

5.6 Leachate O&M System

5.6.1 Equipment and Process Description

The leachate collection system consists of an existing storm sewer line within the landfill, a collection manhole with a submersible pump, and a 6,500-gallon Baker tank. Rainwater that infiltrates through the landfill is collected by an existing storm sewer line, which drains to the concrete manhole. The water collected in the manhole is pumped to the storage tank where it is stored prior to shipment off-site. The tank contents are emptied into a tanker truck and sent to the Niagara Falls POTW for treatment and disposal. The following sections provide descriptions of the system components and process instrumentation controls and alarms. System record drawings, which detail the system layout and as-built conditions, are provided in Appendix B. Manufacturer's equipment specifications and O&M manuals are provided in Appendix D.

Leachate Collection Manhole and Submersible Pump

An existing 17-inch vitrified clay pipe, located within the landfill, collects leachate generated by rainwater and groundwater that comes in contact with the landfill material. The concrete manhole was installed to intercept and collect the leachate accumulating in the pipe. The manhole is 4 feet in diameter with a depth of approximately 8.8 feet. The manhole capacity is approximately 810 gallons or 94 gallons per foot. The manhole is pre-cast concrete that has been treated with a waterproof bitumastic protective coating. The top of the manhole is flush with the surface of the landfill.

The manhole hatch is an aluminum CH-2AL style manufactured by Syracuse Castings Sales Corporation. The hatch is supplied with a gasket to control odors and is equipped with a heavy-duty pneumatic spring for ease of operation.

Water drains into the manhole by gravity and is pumped to the collection tank by a Flyght model SX-3 dewatering submersible pump (P-101). A built-in mercury float switch (LS-101) activates the submersible pump. The float switch allows automatic unattended operation of the submersible pump. Water is pumped through 1½-inch PVC below ground piping to the leachate storage tank. The underground piping is covered with fiberglass insulation and is designed to allow water to drain back to the manhole when the pump turns off to prevent freezing of the line during cold weather.

Leachate Storage Tank

The leachate is collected in a 6,500-gallon polypropylene storage tank, owned by DuPont. The storage tank is 12 feet high with a diameter of 10 feet. The amount of leachate collected can be determined by sounding the height of liquid and converting the liquid height to volume using the manufacturer's chart in Appendix D.

The tank includes a polyethylene secondary containment system. The secondary containment is 45 feet long by 10 feet wide by 10 inches high and has a total containment capacity, subtracting the volume taken up by the tank, of 650 gallons (approximately 10% of the tank capacity).

The tank has two 3-inch valves located on the bottom of the tank for unloading. The valves are locked closed except during tank emptying operations. The tank contents are emptied on an as-needed basis into a vacuum tanker trailer car and sent to the Niagara Falls POTW or another approved off-site facility for treatment/disposal.

Carbon Vent System

The tank vent is equipped with a carbon canister to remove sulfide odors. The vent line consists of a 4-inch PVC pipe connected to the tank manway access cover at the top of the tank. The vent line is equipped with a vacuum relief valve, which must be opened during tank emptying operations. The canister is a 55-gallon Ventsorb plastic drum containing CENTAUR HSV catalytic activated carbon supplied by Calgon Carbon Corporation. The carbon canister is located within the tank's secondary containment area. The canisters are replaced when the carbon is expended, and the used canisters are shipped for off-site recycling by Calgon.

Electrical Panel enclosure and System Controls and Alarms

The leachate collection system is designed for automatic unattended operation. The system includes instrumentation and alarms to automatically control leachate pumping and alert an off-site operator of system conditions. Electrical power and instrumentation signals are sent to the electrical panel enclosure. The electrical panel enclosure is a Hoffman stainless steel, floor mount, two-door, type 12 enclosure. The electrical panel layout is as shown on the record drawings (see Appendix B).

The system instrumentation and alarms are shown on the Process and Instrumentation Diagram in Appendix B and include:

- Submersible pump level switches (LS-101 and LS-102)
- Tank level switches (LS-201 and LS-202)

The submersible pump high level switch (LS-101) is designed to activate the pump when the pre-set high level is reached in the sump. This switch also automatically shuts down the pump at the pre-set low level. The submersible pump high-high level switch (LS-201) is set at 2.5 feet above the bottom of the manhole or 235 gallons. The high-high switch signal activates an alarm to alert the operator that water in the manhole is above normal pumping conditions. The submersible pump is not interlocked with this manhole high-high alarm and will continue to run under this alarm condition.

The tank is equipped with two level switches (LS-201 and LS-202). The high level switch (LS-201) is set at 8.5 feet or 4,940 gallons to alert the operator that the tank is approximately 75% of the capacity of a tanker truck. The submersible pump will continue to run when this switch is activated. The high-high level switch (LS-202) is set at 9 feet or 5,200 gallons (approximately 80% of the storage tank volume). This switch is interlocked to shut off the manhole submersible pump and also sends an alarm to the operator.

The tank alarms are relayed to the alarm autodialer housed in the electrical panel to alert the off-site operator of system conditions. The alarm autodialer is a Guard-It model from RACO Manufacturing and Engineering Company. The autodialer can be programmed with up to 8 different phone numbers. The alarm autodialer will continue to call the pre-programmed numbers until the alarm is acknowledged by the remote operator. The autodialer will call back the remote operator every 30 minutes until the alarm is acknowledged on-site at the electrical control panel. A detailed O&M manual for the autodialer is provided in Appendix D.

5.6.2 Standard Operating Procedures

This section provides a description of the following procedures:

- Routine operations
- Non-routine operations
- Maintenance activities

Routine Operating Procedures

Normal operations should require minimal attention by the operator because the system is designed for automatic unattended operation. Therefore, under normal operating conditions, the operator will only need to perform periodic visual inspections of the system. The following items should be visually inspected during each visit to the site:

1. Lift the manhole cover to check the water level in the manhole and check the condition of the submersible pump and discharge piping.
2. Activate the submersible pump with the float switch to check proper pump operations.
3. Check for leaks around piping and tank valves.
4. Check condition of secondary containment area.
5. Check that locks are in place on tank valves.
6. Check tank manway to ensure that all openings are sealed.
7. Note source of any odors observed.
8. Sound tank to determine approximate tank volume (see vendor chart in Appendix D).

Non-Routine Operating Procedures

Non-routine operating conditions include tank emptying and carbon canister change-out.

Tank Emptying

The frequency of tank emptying operations will depend on the time of year and amount of leachate generated. The tank will be emptied into a vacuum tanker trailer truck by a licensed waste hauler. The operator will be present during all tank emptying operations such that the operations are safely conducted in accordance with the HASP and the following procedures.

To empty the tank contents, complete the following steps:

1. Turn off the submersible pump by using the main disconnect switch on the electrical enclosure.
2. Open the vacuum relief valve for the vent line carbon canister.
3. Unlock the valve lock and remove the cap.
4. Connect hose to the outlet valve on the bottom of the tank.
5. Open outlet valve, inspect hose for leaks, and begin transferring water to the tanker truck.
6. After tanker truck is filled, close the valve and disconnect the hose.
7. Secure and lock the valve lock and valve cap.
8. Close the vacuum relief valve for the vent line carbon canister.
9. Turn on the submersible pump by using the main disconnect switch on the electrical enclosure.

Carbon Canister Change-out

The frequency of the carbon canister change-out will depend on the efficiency of odor removal. The canisters will be removed if odors are observed at the canister outlet during routine inspections.

To change the carbon canister, complete the following steps:

1. Turn off the submersible pump by using the main disconnect switch on the electrical enclosure.
2. Open the vacuum relief valve for the vent line carbon canister.
3. Disconnect the vent piping from the canister inlet coupling.
4. Plug inlet and outlet connections of spent canister. Label spent canister as specified in the Waste Management Plan (see Appendix C).
5. Remove any plugs on the inlet or outlet fittings for the new canister supplied by Calgon.
6. Connect the vent piping to the new canister inlet coupling.
7. Close the vacuum relief valve for the vent line carbon canister.
8. Turn on the submersible pump by using the main disconnect switch on the electrical enclosure.

Maintenance Activities

The system will require very little routine maintenance under normal operating conditions. However, periodic maintenance may be required for the pump or instrumentation repairs and replacements. The manufacturer's recommended maintenance procedures in Appendix D should be consulted for these activities.

The submersible pump is equipped with a quick disconnect to facilitate pump inspections, repairs, and replacements. A spare pump is located within the electrical enclosure. Under normal maintenance activities, personnel entrance to the manhole will not be required. If entrance to the manhole is required, confined space entry procedures described in Appendix B of the HASP must be followed (CRG, 2000).

5.6.3 Safety Procedures

Because the site is undergoing remedial activities under an order with NYSDEC, a site-specific HASP has been prepared for the leachate collection system. The HASP provides descriptions of expected chemical and physical hazards as well as minimum safety procedures for construction and operation of the system. DuPont also performed a project safety analysis (PSA), which is provided in the HASP. The PSA will be updated on a yearly basis or more frequently as conditions warrant. Descriptions of facility safety equipment and specific lockout/tagout procedures are provided in this section.

Facility Safety Equipment

The facility is (will be) equipped with the following safety equipment:

- Fire extinguisher-Class C for electrical type fires, located within the electrical panel enclosure
- Portable eyewash station, located adjacent to the leachate storage tank

Electrical Lockout/Tagout Procedures

Electrical lockout/tagout will be required during any maintenance or repairs of the leachate collection system components. Prior to any work on the system components, the component will be locked, tagged, cleared, and tried to ensure that the component is de-energized. The main disconnect switch on the exterior of the panel enclosure will de-energize the entire system and is the recommended lock-out location for maintenance or repair activities. If warranted, the individual circuits may be isolated as indicated on the electrical drawings (see Record Drawings in Appendix B).

5.6.4 Waste Management Procedures

Waste management procedures for the leachate collection system are included in the Waste Management Plan (see Appendix C).

5.7 Ditch Maintenance

Ditch maintenance will consist of periodic visual inspections until a full stand of natural vegetation is established in the excavated area (first growing season following excavation). Deed restrictions are not required because the contaminated soil has been removed.

6.0 NOTIFICATION AND REPORTING

Post-construction reporting will consist of annual reporting. The annual letter report will follow the same format of the current Lyndonville Quarterly Progress Reports and will summarize the leachate collection system O&M activities and the monthly inspections of the landfill cap and repairs, if required. Should conditions change at the site (i.e., sulfide odors from the landfill vents or demolition of the Dobbins' juice building), NYSDEC will be immediately notified of the site change by telephone, followed up in writing with proposed corrective actions.

7.0 REFERENCES

DuPont Corporate Remediation Group (CRG). 2004a. Health and Safety Plan for Lyndonville West Avenue Site, Cap Construction, Lyndonville, New York.

_____. 2004b. Cap Design, Lyndonville West Avenue Site, Lyndonville, New York.

_____. 2003. Revised Focused Feasibility Study, Lyndonville-West Avenue Site, Lyndonville, New York.

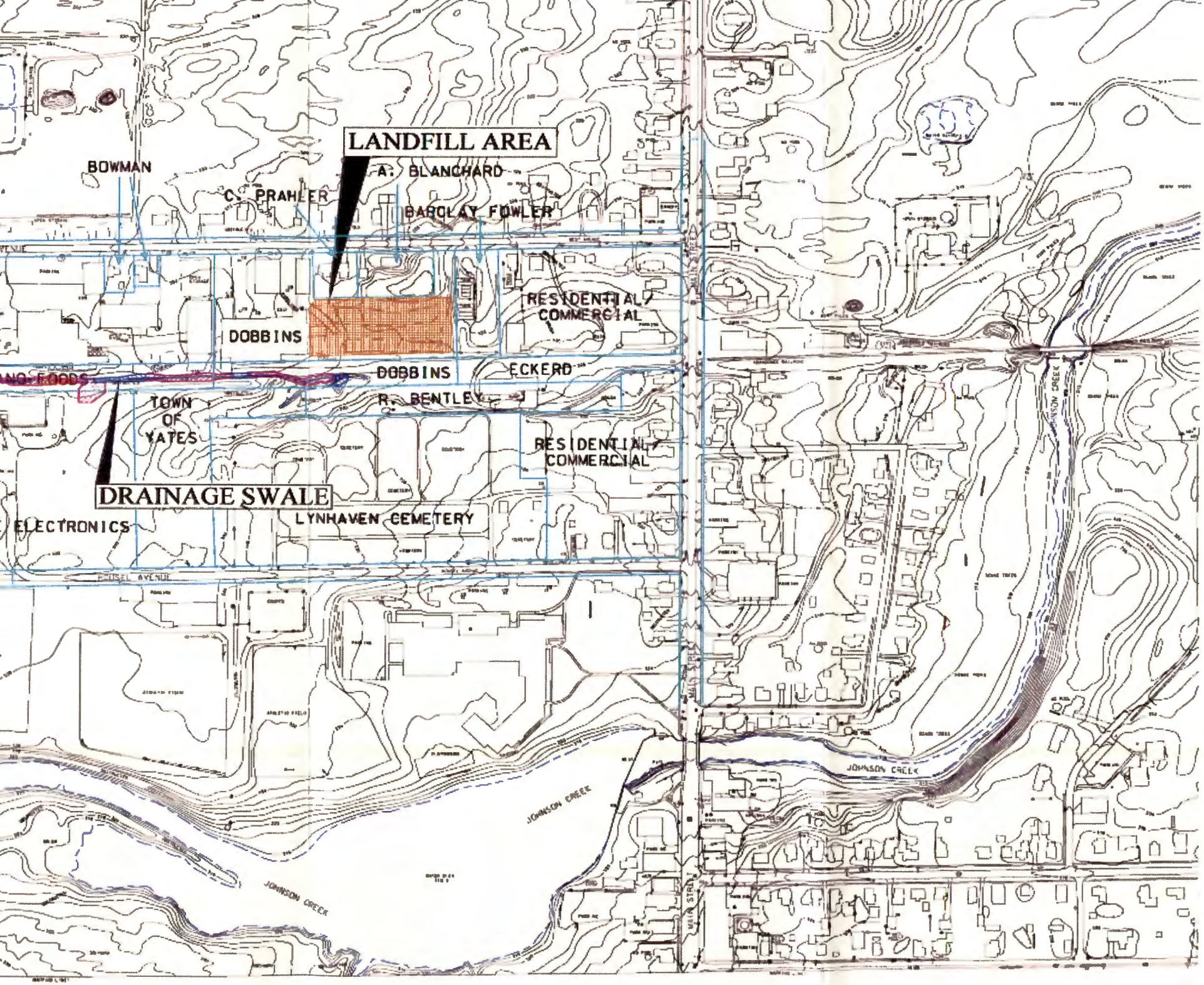
_____. 2001. Supplemental Remedial Investigation Report, Lyndonville – West Avenue Site, Lyndonville, New York.

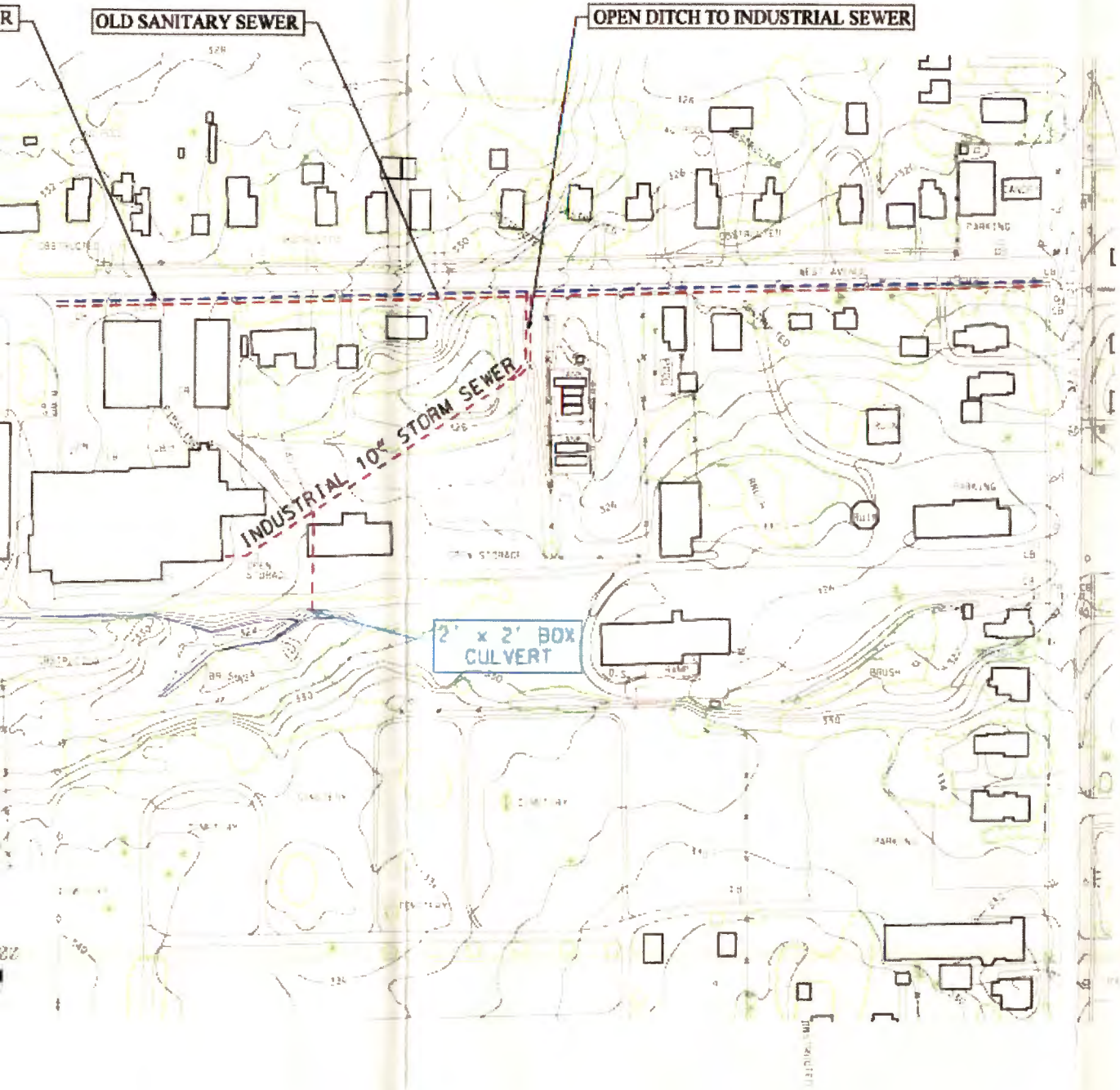
_____. 2000. Health and Safety Plan for Lyndonville Leachate Collection System, DuPont, Lyndonville Landfill Site, Lyndonville, New York.

_____. 1998. Supplemental Environmental Assessment Report, Lyndonville – West Avenue, Lyndonville, New York.

New York State Department of Environmental Control (NYSDEC). 1994. *Technical and Administrative Guidance Memorandum (TAGM) #4046 Description of Soil Cleanup Objectives and Cleanup Levels.*

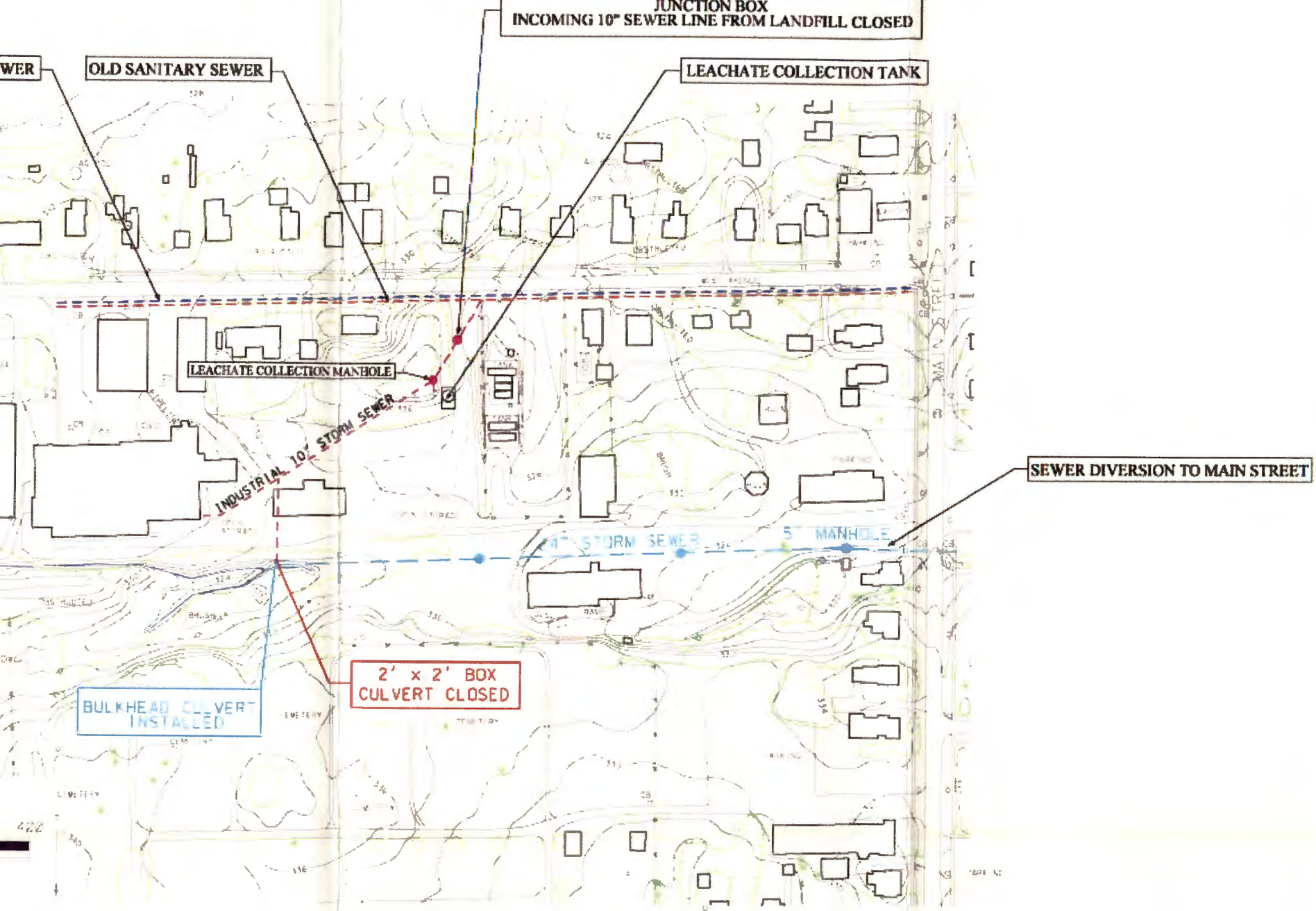
FIGURES


LANDFILL AREA
A. BLANCHARD
BARCLAY FOWLER
BOWMAN
C. PRAHLER
DOBBINS
RESIDENTIAL/
COMMERCIAL
DOBBINS
ECKERD
R. BENTLEY
TOWN
OF
YATES
RESIDENTIAL/
COMMERCIAL
DRAINAGE SWALE
LYNHAVEN CEMETERY
ELECTRONICS
JOHNSON CREEK
JOHNSON CREEK
JOHNSON CREEK



NT PLAN
ONFIGURATION PRIOR TO 1975

DRAWN	DESIGNED	FILE NUMBER
GEB	GEB	
CHECKED	APPROVED	
JAK	JMM	FIGURE NO



NT PLAN

NFIGURATION AFTER LANDFILL LEACHATE REMEDIAL ACTIONS

DRAWN	DESIGNED	FILE NUMBER
GEB	GEB	
CHECKED	APPROVED	
JAK	JMM	

APPENDICES

APPENDIX A

EPA AND NYSDEC CORRESPONDENCE

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 8
6274 East Avon-Lima Road, Avon, New York 14414-9519
Phone: (585) 226-5355 • **FAX:** (585) 226-8696
Website: www.dec.state.ny.us

Denise M. Sheehan
Acting
Commissioner

February 23, 2005

Robert B. Genau
Senior Project Leader
DuPont
Barley Mill Plaza, Building 27, Office 2274
Routes 141 & 48
Wilmington, DE 19805

Re: Lyndonville West Avenue, Site # 837002
Lyndonville (V), Orleans (C)

Dear Mr. Genau:

The New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) have received the requested stamped cover page and the Health and Safety Plan for the remedial construction design at the Lyndonville West Avenue site. The HASP is hereby approved and the design is complete.

As per my November 12, 2004 letter to you, please provide me with a Site Management Plan for our review as soon as practical. This document needs to be reviewed by NYSDEC and in place at the completion of the fieldwork.

If you have any questions, please contact me.

Sincerely,

David G. Pratt, P.E.
Environmental Engineer 2

ec: B. Putzig
M. Forcucci
G. Bailey
W. Dickinson

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 8
6274 East Avon-Lima Road, Avon, New York 14414-9519
Phone: (585) 226-5355 • **FAX:** (585) 226-8696
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

November 12, 2004

Robert B. Genau
Senior Project Leader
DuPont
Barley Mill Plaza, Building 27, Office 2274
Routes 141 & 48
Wilmington, DE 19805

Re: Lyndonville West Avenue, Site # 837002
Lyndonville (V), Orleans (C)

Dear Mr. Genau:

The New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) have reviewed the September 2004 Cap Design Report for the Lyndonville West Avenue site. The design is hereby approved and may proceed to bidding. However, the following comments will need to be addressed prior to final approval to proceed with construction:

1. The report itself must be stamped by a licensed professional engineer (the drawing were properly stamped). Please provide a stamped cover page for the September report.

2. A complete Health and Safety Plan will need to be submitted for NYSDEC and NYSDOH review. Adequate community air monitoring will be required.

3. A Site Management Plan (SMP) needs to be developed. This will need to include an Operation, Maintenance and Monitoring Plan that clearly spells out DuPont's and the landowner's responsibilities. An Environmental Easement will need to be filed for the affected properties. Language for this easement is currently being finalized by the NYSDEC.

4. The SMP will need to include provisions for dealing with sulfide odors from the proposed landfill vents if, in the future, this becomes an issue.

5. The SMP will need to include provisions for expanding the cap if any of the on-site buildings are removed in the future.

Please provide the requested items, as well as a proposed schedule for fieldwork, for our review and approval prior to the commencement of fieldwork. If you have any questions, please contact me.

Sincerely,

David G. Pratt, P.E.
Environmental Engineer 2

cc: B. Putzig
M. Forcucci
G. Bailey
W. Dickinson

APPENDIX B

RECORD DRAWINGS

LYNDONVILLE
WEST AVENUE SITE

L LEACHATE COLLECTION SYSTEM

PREPARED FOR:

DUPONT

Corporate Remediation Group

An Alliance between
DuPont and The W-C Diamond Group

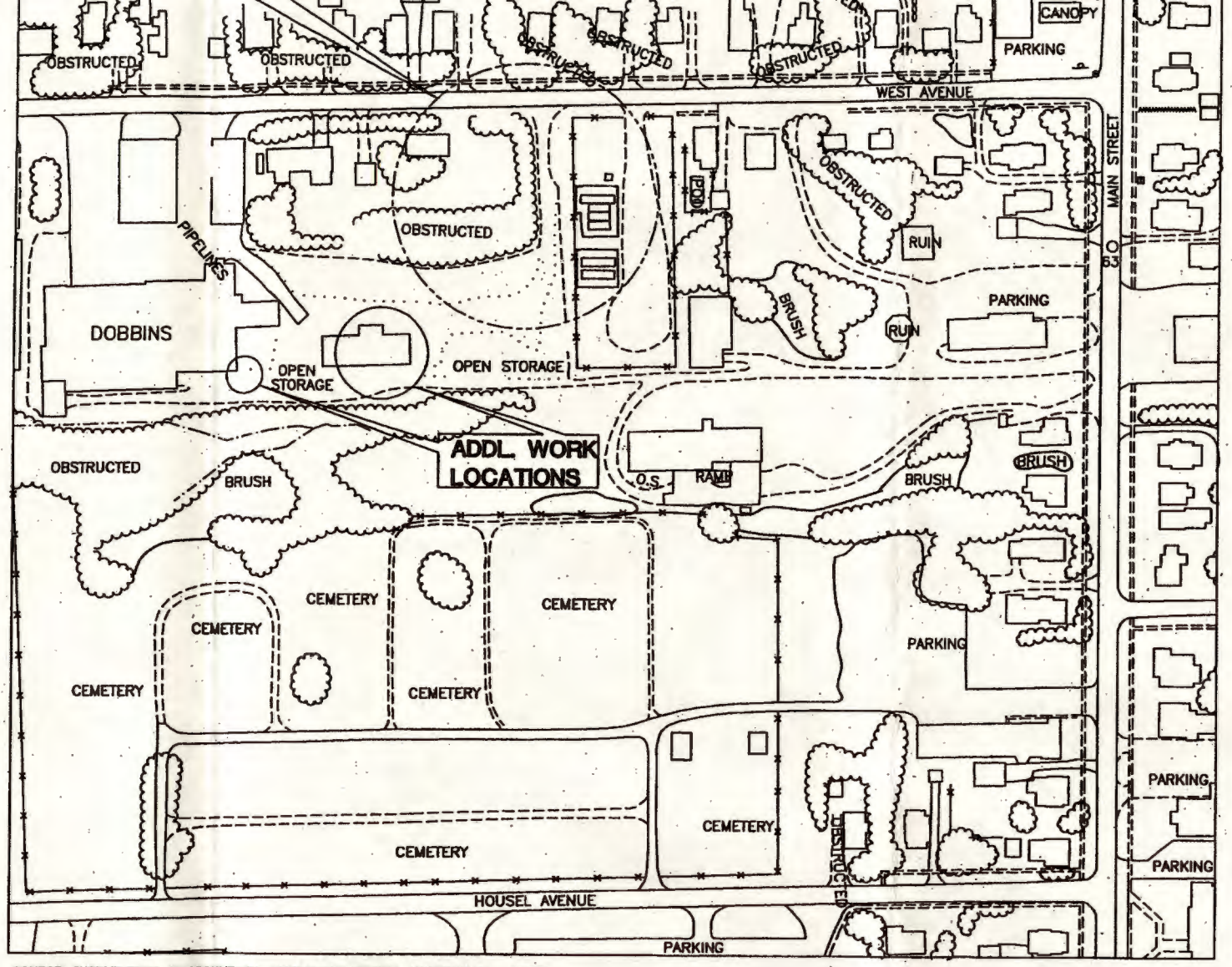
BARLEY MILL PLAZA, BUILDING 27
WILMINGTON, DELAWARE 19880-0027

PREPARED BY:

URS Corporation
Group Consultants

MARCH 2001
RECORD DRAWINGS

RECORD DRAWING
DRAWING HAS BEEN
TO HALF-SIZE



SOURCE: SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT REPORT, LYNDONVILLE – WEST AVENUE SITE, DUPONT CORPORATE REMEDIATION GROUP, JULY 12, 1998.

SITE LOCATION MAP

100' 0 100'

SCALE: 1"= 100'

RECORD DRAWING

THIS DRAWING HAS BEEN REDUCED TO HALF-SIZE

URS Corporation

Group Consultants

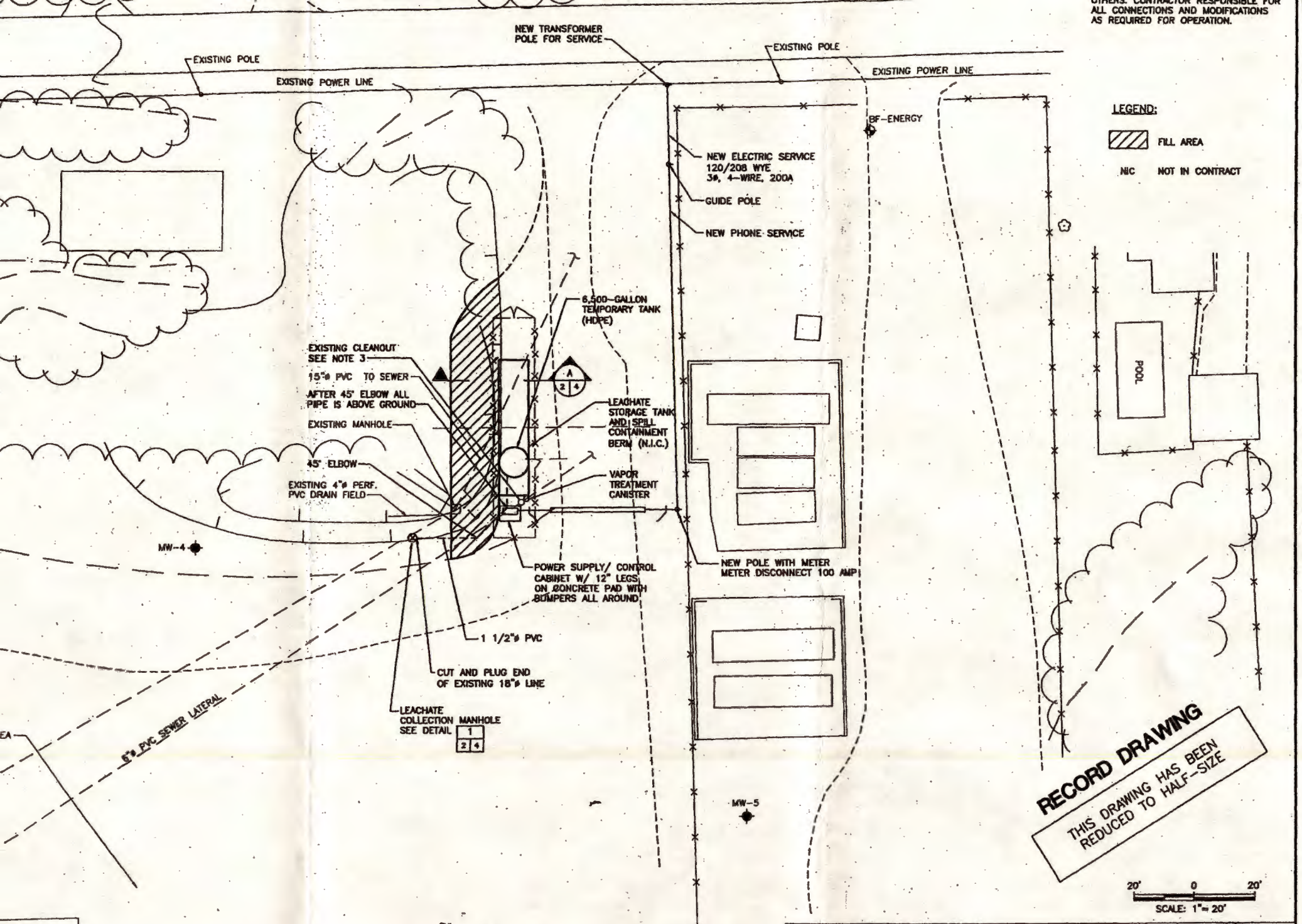
REV. NO. –

0	ISSUED FOR BID		11-00
1	DRAINAGE SYSTEM ADDED	DMC	12-05-00

DESIGNED	DON McCALL	INITIALS DMC
DRAWN		

DUPONT

INDEX, GENERAL NOTES, AND SITE MAP



UTILITIES: CONTRACTOR RESPONSIBLE FOR ALL CONNECTIONS AND MODIFICATIONS AS REQUIRED FOR OPERATION.

0	ISSUED FOR BID		11-00
1	MINOR REVISIONS ISSUED FOR CONSTRUCTION	DMC	12-05-00

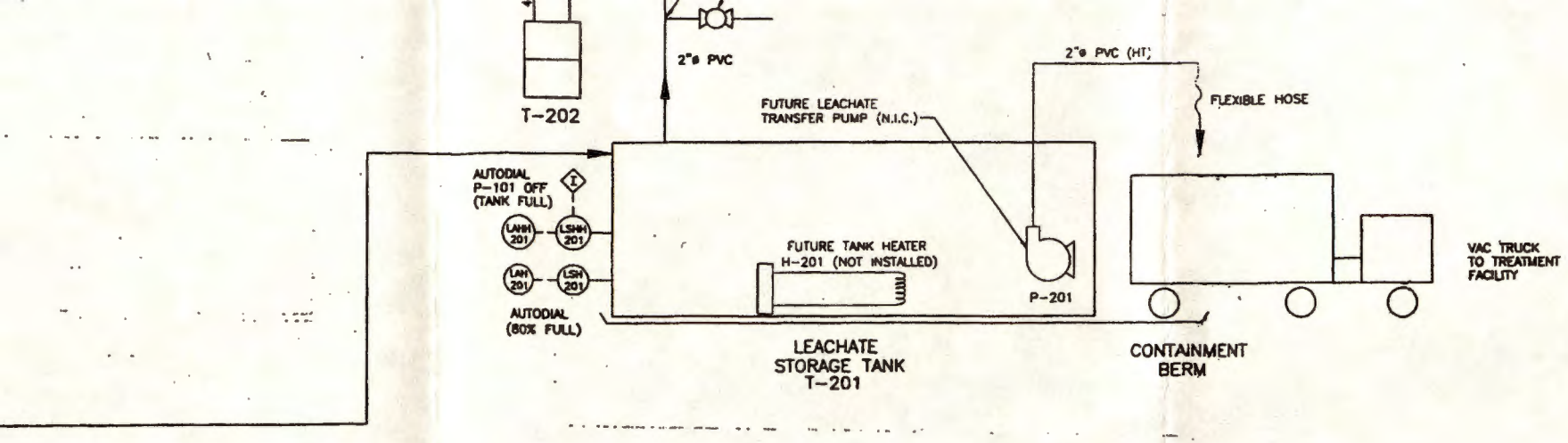
DESIGNED	INITIALS
DONALD McCALL	DMC
DRAWN	

URS Corporation
Group Consultants

REV. NO.
-

DU PONT

SITE LAYOUT PLAN



P-101
SUBMERSIBLE PUMP
FLIGHT MODEL SX-3
25 GPM 30' TDH 0.75 HP

H-201
TANK HEATER
(FUTURE)

P-201
TRANSFER PUMP
(FUTURE)

15"ø PVC → EXISTING DISCHARGE TO STORM SEWER

T-202
ODOR CONTROL CANISTER
170 LB. CALGON VENTSORB-PE
CENTAUR CATALYTIC CARBON

T-201
LEACHATE STORAGE TANK
AND CONTAINMENT BERM
AS PROVIDED BY OTHERS

STING JUNCTION
X (CONCRETE)
COVERED WITH FILL
TERIAL AND STAKED)

RECORD DRAWING
THIS DRAWING HAS BEEN REDUCED TO HALF-SIZE

NOTE:

1. PROVISION OF THE LEACHATE TRANSFER PUMP AND TANK HEATER IS NOT INCLUDED IN THIS CONTRACT. CONTRACTOR SHALL PROVIDE ELECTRICAL POWER SUPPLY AND CONTROLS FOR FUTURE INSTALLATION OF THE PUMP OR HEATER.

REV.	DESCRIPTION	BY	DATE
0	ISSUED FOR BID		11-00
1	ISSUED FOR CONSTRUCTION	DMC	12-05-00
2	ISSUED FOR RECORD DRAWING	DMC	3-6-01

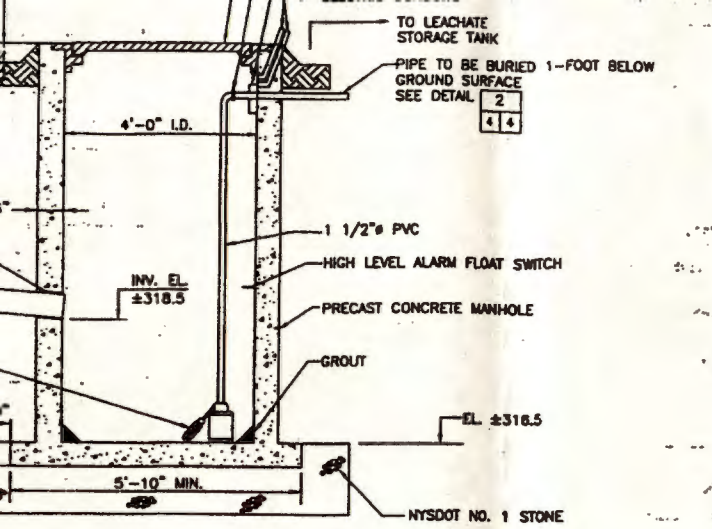
URS Corporation
Group Consultants

REV.-NO.: -

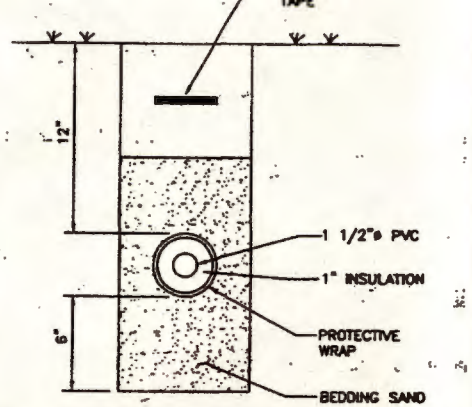
	INITIALS
DESIGNED: DONALD McCALL	DMC
DRAWN	

CHECKED

PROCESS & INSTRUMENTATION DIAGRAM

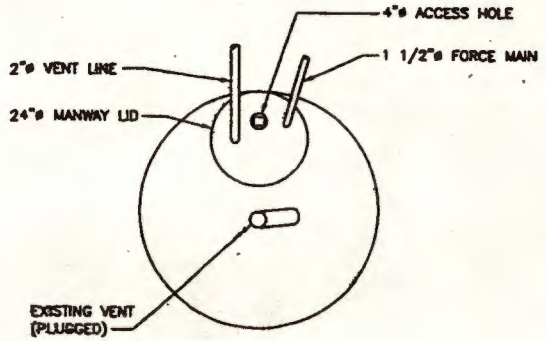


SECTION



NOTE:
BURIED 18" AT MANHOLE
BURIED 12" AT TANK
DRAINS BACK TO MANHOLE

PIPE INSTALLATION DETAIL 2 4 4
NOT TO SCALE



TANK LID DETAIL
NOT TO SCALE

DETAIL 1 2 4

LINER AND 6" SPILL CONTAINMENT BERM (BY OTHERS)

EXISTING DRIVEWAY

ADES ARE

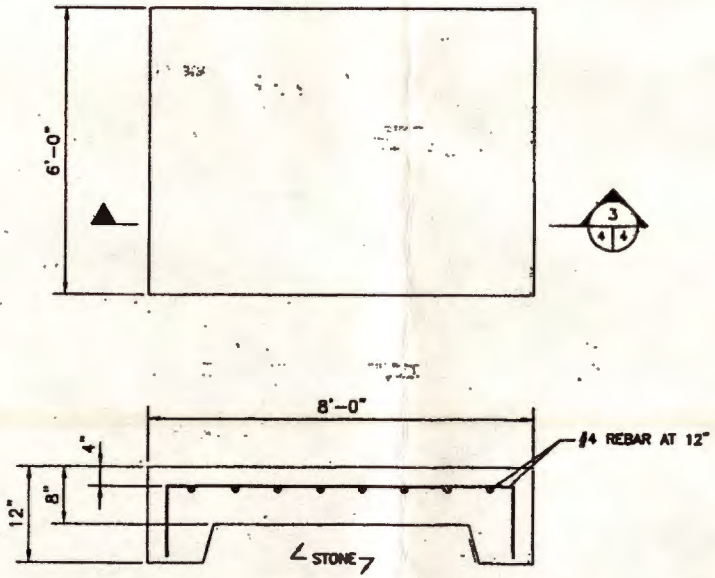
A 2 4

MATERIALS:

A. PROPOSED FILL SHALL CONFORM TO NYSDOTSS TABLE 703-4, EITHER ONE OF SIZE 1, SIZE 2 OR SIZE 3A; AND SHALL CONSIST OF CRUSHED STONE OR CRUSHED GRAVEL.

EXECUTION:

1. STRIP ALL EXISTING VEGETATION IN PROPOSED FILL AREA.
2. REPLACE SOFT SUBGRADE AREAS WITH PROPOSED FILL.
3. SCARIFY ALL PROPOSED FILL SURFACES.
4. DRY OUT OR REPLACE AREAS OF STANDING WATER OR SEEPS. DO NOT PLACE FILL IN SUCH WET AREAS.
5. PLACE FILL IN 1-FOOT HORIZONTAL LIFTS AND COMPACT TO RELATIVELY DENSE/UNYIELDING STATE. REQUIRE MINIMUM 4 PASSES PER LIFT W/EARTH SPREADING EQUIPMENT.
6. PLACE AND COMPACT A 6-INCH LAYER OF STONE (SEE NOTE A) IN THE AREA FOR TANK PLACEMENT.



CONCRETE PAD DETAIL 3 4 4
NOT TO SCALE

RECORD DRAWING
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D	ISSUED FOR BID		11-00
1	MINOR REVISIONS	DMC	12-05-00
	ISSUED FOR CONSTRUCTION		

DESIGNED	INITIALS
DONALD McCALL	DMC
DRAWN	

URS Corporation
Group Consultants

REV. NO. -

DETAIL DRAWINGS

manual control.

8. Controls, interlocks and alarms for automatic shutdown of the system upon high level in the storage tank. All level switches shall be single-point float switches. The switches shall be housed in chemically resistant polypropylene.

9. An alarm autodialing and remote monitoring alarm system, Guard-It (TM) as manufactured by RACO. In the event of an alarm condition, the unit shall be pre-programmed to call up to eight different phone numbers until acknowledged.

10. The leachate storage tank and spill containment berm will be supplied by others. The Contractor shall be responsible scheduling delivery of the tank based on his construction schedule and for directing placement of the tank and berm.

B. Power and Controls:

1. The Contractor shall be responsible for furnishing and installing all electric service to the leachate collection and storage system.

2. The Contractor shall be responsible for furnishing and installing all conduit and wiring for all equipment. This includes all power, control and instrumentation interconnections required for a fully operable system.

3. The Contractor shall be responsible for installing all motor starters, equipment, unit heaters, skid mounted equipment, disconnects, power feeder wiring, lighting fixtures, instrumentation, controls, etc., associated with the system.

4. The system control panel shall contain all operator interface and local control devices, motor starters, circuit breakers, control power transformers, system disconnect switches, and auto-dialing alarm system components.

5. The Contractor shall provide a power supply/control cabinet as required to house all system components, and with additional space for future equipment. The size of the cabinet shall be approved by the engineer.

6. Operator Controls and Indicators:

a) High liquid level alarms for the leachate collection manhole and the storage tank.

b) Hand/off/auto switch and running indicator light for the submersible leachate pump.

c) All additional alarms, controls, and interlocks as indicated on the Contract Drawings and as required for proper operation and monitoring.

7. All work outdoors and in wet locations shall be weatherproof. All material, equipment, and incidentals in hazardous locations shall meet NEC/NFPA/UL/NEMA/OSHA requirements for hazardous locations.

C. Odor Control System:

1. The Contractor shall install a Calgon Ventsorb PE odor control system on the vent(s) of the leachate storage tank. The system shall contain Centaur-HSV® catalytic carbon as manufactured by Calgon Carbon Corporation.

2. The Contractor shall provide a 4-inch thick concrete pad for supporting the carbon canister and any associated piping.

3. The Contractor shall provide and install all piping as required for connection and venting of the odor control canister. The vent pipe shall be equipped with bird/bug screen.

NO.	DESCRIPTION	BY	DATE
0	ISSUED FOR BID		11-00
1	MINOR REVISIONS	DMC	12-05-00
	ISSUED FOR CONSTRUCTION		

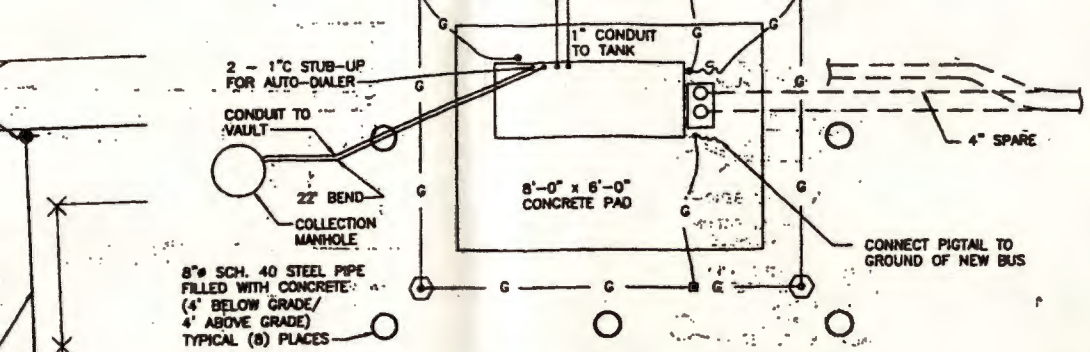
DESIGNED DONALD McCALL INITIALS DMC
DRAWN

URS Corporation
Group Consultants

REV. NO.

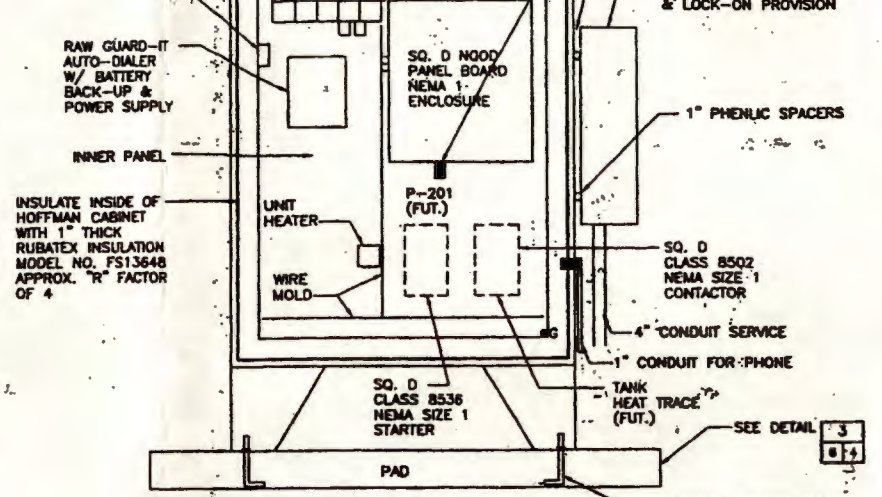
DUPONT

EQUIPMENT SPECIFICATIONS



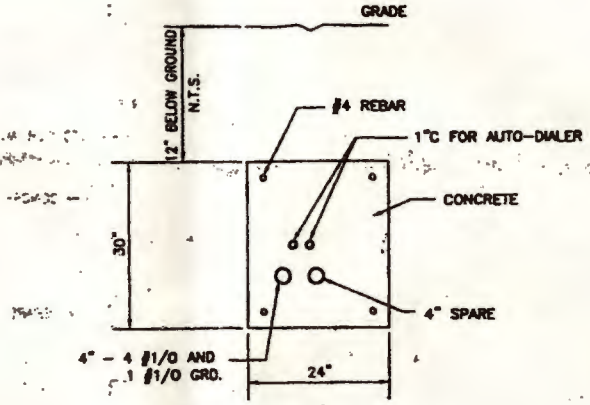
ENLARGED PANEL LOCATION PLAN

SCALE: 1" = 2'-6"



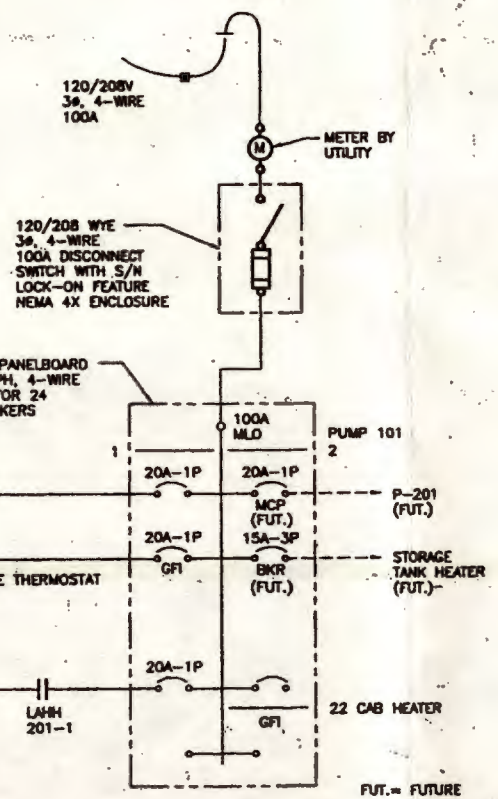
CONTROL PANEL DETAIL

N.T.S.



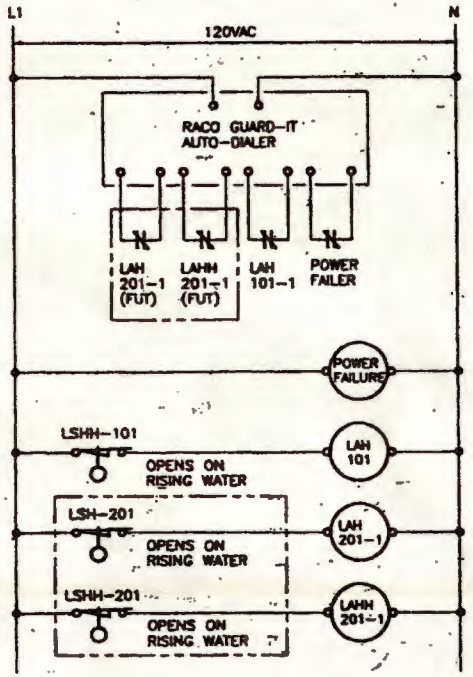
DUCT BANK BENEATH ROAD

N.T.S.



ONE LINE SCHEMATIC

N.T.S.



CONTROL SCHEMATIC

N.T.S.

FUT.= FUTURE

NTS= NOT TO SCALE

RECORD DRAWING
THIS DRAWING HAS BEEN REDUCED TO HALF-SIZE

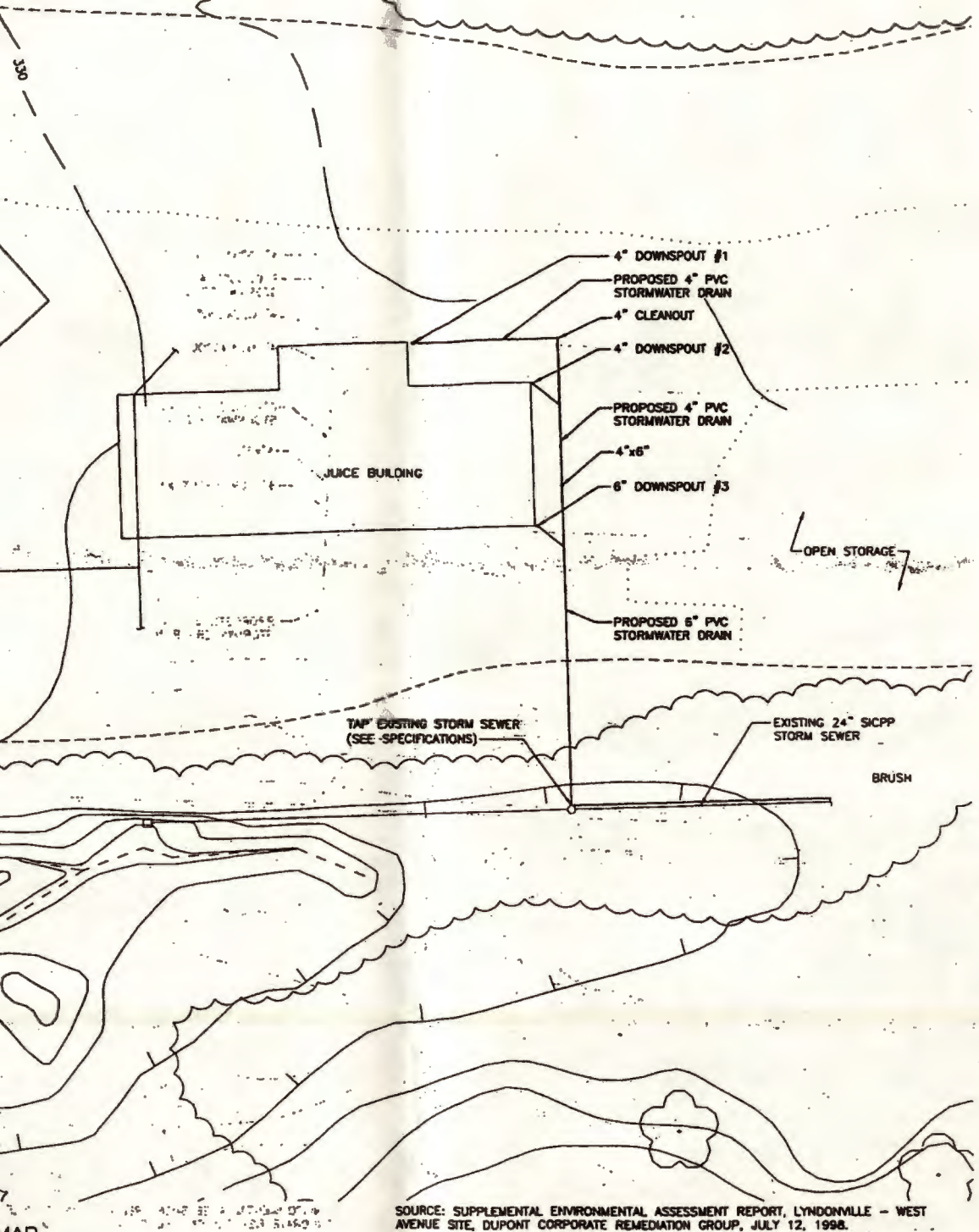
URS Corporation
Group Consultants

REV. NO.

0	ISSUED FOR BID		11-00
1	MINOR REVISIONS	DMC	12-05-00

		INITIALS
DESIGNED	JOE LEWANDOWSKI	JL
DRAWN		

SITE LAYOUT PLAN
ELECTRICAL



SOURCE: SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT REPORT, LYNDONVILLE – WEST AVENUE SITE, DUPONT CORPORATE REMEDIATION GROUP, JULY 12, 1998.

STORM DRAIN PIPE AT THE SOUTHEAST CORNER OF THE MAIN BUILDING AND TO INSTALL A NEW STORM DRAIN PIPE FROM THE JUICE BUILDING TO THE EXISTING 24-INCH STORM SEWER LOCATED APPROXIMATELY 75 FEET SOUTH OF THE JUICE BUILDING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROCUREMENT AND INTEGRATION OF ALL COMPONENTS TO MEET THE REQUIREMENTS OF THE SPECIFICATIONS, AS OUTLINED IN THIS SCOPE OF WORK AND AS SHOWN ON THE CONTRACT DRAWINGS.

1.2 PERFORMANCE OBJECTIVES

THE NEW STORMWATER DRAINAGE SYSTEM SHALL CONVEY STORMWATER FROM THE THREE DOWN SPOUT CONNECTIONS TO THE 24-INCH STORM SEWER AT A MINIMUM FLOW RATE OF 100 GPM.

1.3 MINIMUM REQUIREMENTS FOR THE STORMWATER DRAINAGE SYSTEM COMPONENTS.

SOIL MAY CONTAIN LEACHATE. THE CONTRACTOR SHALL TAKE APPROPRIATE PRECAUTIONS.

A. ABANDONMENT OF EXISTING MAIN BUILDING STORMWATER DRAIN

1. EXPOSE PIPE VIA HAND EXCAVATION. CUT PIPE A MINIMUM OF 1 FOOT BELOW GRADE.
2. IF PIPE IS 6 INCHES IN DIAMETER OR LESS, PLUG PIPE USING AN APPROPRIATE SIZED PLUG TO MAKE WATERTIGHT.
3. FOR PIPE GREATER THAN 6 INCHES, INSERT SUITABLE PACKING MATERIAL INTO THE ENTRANCE OF THE PIPE. FILL PIPE FROM EXPOSED END WITH CONCRETE OR CEMENT GROUT FOR A MINIMUM DISTANCE OF 3 FEET.

B. INSTALLATION OF NEW STORM DRAIN PIPE

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FURNISH AND INSTALL ALL COMPONENTS NECESSARY TO PROVIDE A COMPLETE, WORKABLE, AND EFFICIENT STORM DRAIN PIPE SYSTEM. THE SYSTEM SHALL BE CAPABLE OF ACHIEVING THE REQUIREMENTS SPECIFIED HEREIN AND AS SHOWN ON THE CONTRACT DRAWINGS. THE CONTRACTOR SHALL SUPPLY AND INSTALL, BUT NOT BE LIMITED TO, THE FOLLOWING COMPONENTS.

1. ALL PIPE AND FITTINGS AS REQUIRED FOR GRAVITY FLOW OF STORMWATER FROM STORM DRAINS TO EXISTING 24-INCH STORM SEWER. ALL PIPE SHALL BE PVC. THE PIPE SHALL BE INSTALLED SUCH THAT A 1/4-INCH SLOPE PER FOOT TOWARDS THE EXISTING 24-INCH STORM SEWER IS MAINTAINED FOR THE ENTIRE LENGTH. THE ENTIRE LENGTH OF THE PIPE SHALL DRAIN FREELY TO THE EXISTING 24-INCH STORM SEWER.
2. THREE DOWNSPOUT TRANSITION PVC FITTINGS SUITABLE FOR CONNECTION TO EXISTING DOWNSPOUTS.
3. ONE CLEANOUT PLUG CAP, CAST IRON WITH RECESSED NUT AS MANUFACTURED BY TYLER PIPE, OR EQUAL.
4. ONE 24-INCH X 6 INCH SDR35 INSERT A TEE WITH RUBBER GASKET, SECURING CLAMP AND RUBBER SLEEVE, AS MANUFACTURED BY FOWLER MANUFACTURING CO., OR EQUAL. CUTTING OF THE EXISTING 24-INCH SICPP PIPE SHALL BE WITH A HOLE SAW, OR EQUAL.

C. RESTORATION

THE CONTRACTOR SHALL RESTORE THE SITE TO ORIGINAL CONDITION. REPAIR OR REPLACE LANDSCAPE SHRUBBERY.

D. DISPOSAL

DISPOSE OF EXCAVATED MATERIALS IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.

GENERAL NOTES:

1. EXISTING FEATURES ARE GENERALLY SHOWN "HALF TONE" IN ALL DRAWINGS EXCEPT THE SITE LOCATION MAP AND AS NOTED OTHERWISE.
2. THE CONTRACTOR SHALL PROTECT ALL EXISTING FEATURES WHICH ARE DESIGNATED OR SPECIFIED TO REMAIN UNDISTURBED.
3. THE CONTRACTOR SHALL NOTIFY ALL AFFECTED UTILITY COMPANIES OR AGENCIES AND RECEIVE CLEARANCE FROM SAID ENTITIES PRIOR TO EXCAVATING, OR SIMILAR WORK.

MAP

20'

WING BEEN IZE

0	ISSUED FOR BID		11-00
1	ISSUED FOR CONSTRUCTION	DMC	12-05-00
2	ISSUED FOR/ RECORD DRAWING	DMC	3-6-01

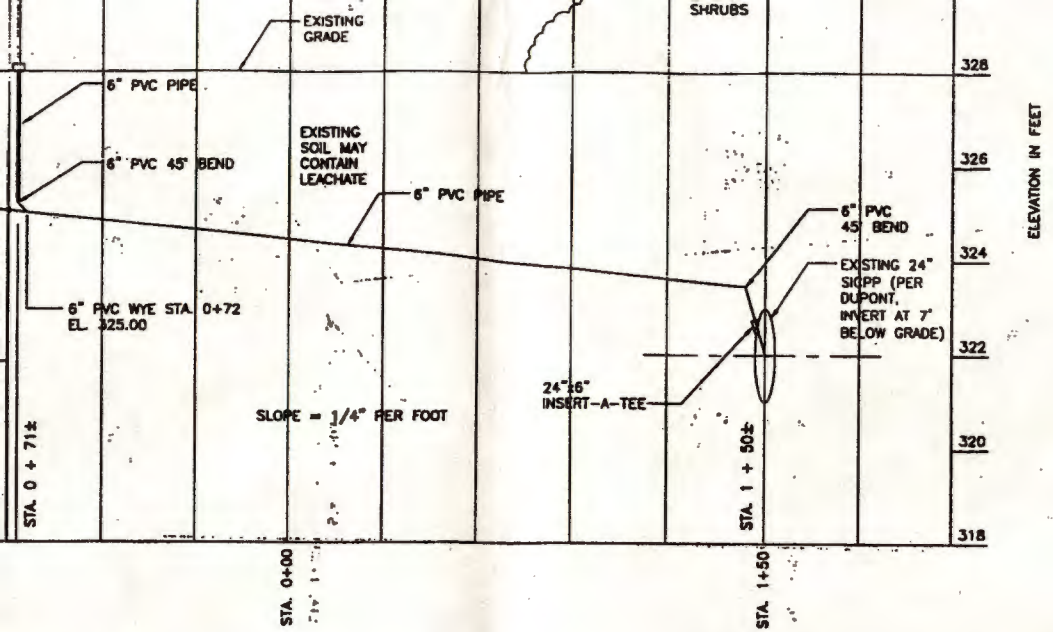
DESIGNED LORI LEHNEN INITIALS LJL
DRAWN

URS Corporation
Group Consultants

REV. NO. -

DUPONT

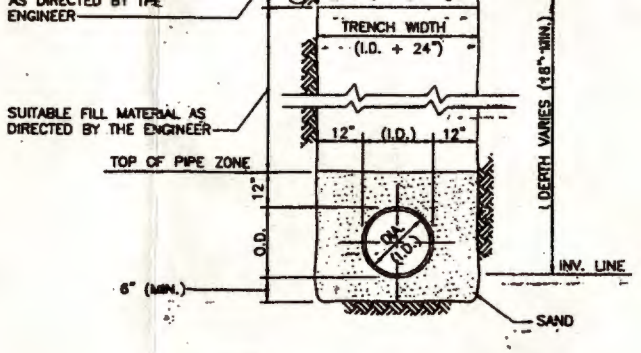
DRAINAGE SYSTEM SITE LAYOUT AND SPECIFICATIONS



OF DRAIN SYSTEM PROFILE

10' 2' 0 2'

E: 1"= 10' VERTICAL SCALE: 1"= 2'

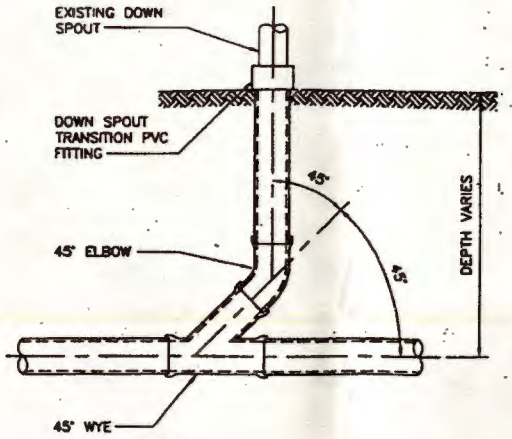


NOTES:

1. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
2. TRENCHING OPERATIONS SHALL INCLUDE ALL NECESSARY DEWATERING.
3. TRENCH DETAILS ARE ONLY SHOWN FOR PURPOSES OF MATERIAL PLACEMENT.
4. AN OSHA APPROVED MOVABLE PROTECTIVE TRENCH SHIELD SHALL BE USED IN ALL UNSHEETED TRENCH AREAS AS REQUIRED BY OSHA/DUPONT.
5. THE BEDDING AND FILL SHALL BE COMPACTED IN 6" LIFTS WITH EQUIPMENT ACCEPTABLE TO THE PIPE MANUFACTURER. NO SLAG SHALL BE ALLOWED FOR BEDDING OR BACKFILL MATERIAL.

TRENCH DETAIL

NOT TO SCALE



TYPICAL DOWN SPOUT INTERCONNECTION DETAIL

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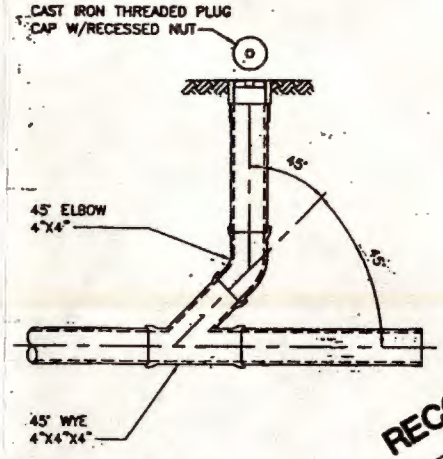

CLEAN OUT DETAIL

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RECORD DRAWING

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1	ISSUED FOR CONSTRUCTION	DMC	12-05-00
2	ISSUED FOR RECORD DRAWING	DMC	3-6-01

DESIGNED	LORI LEHNEN	LJL
DRAWN		

URS Corporation

Group Consultants

REV. NO.

DRAINAGE SYSTEM PROFILE AND DETAILS

APPENDIX C

WASTE MANAGEMENT PLAN

WASTE MANAGEMENT PLAN FOR LYNDONVILLE-WEST AVE SITE LYNDONVILLE, NY

January 2001

Project No. D1LY7236

CORPORATE REMEDIATION GROUP
An Alliance between
DuPont and URS Diamond

Barley Mill Plaza, Building 27
Wilmington, Delaware 19805

Jason G. Sykes
Safety, Health and
Environmental Coordinator

Marcia Thiess
Waste Management
Specialist

Joseph M. McCarthy, P.E.
URS Diamond
Project Manager

WASTE MANAGEMENT PLAN FOR LYNDONVILLE-WEST AVE SITE LYNDONVILLE, NY

January 2001

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TABLE OF CONTENTS

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1.1 PURPOSE

This Investigation, Construction and Remediation Waste Management Plan (WMP) establishes a system for managing, documenting, and monitoring the handling, storage, and disposal of wastes generated during investigation, construction and remediation activities conducted at the Lyndonville-West Ave Site Lyndonville New York. It is the practice of DuPont to minimize waste generation at its source. This WMP reflects those waste minimization efforts to properly minimize waste generated during field activities. These include:

- Properly identifying hazardous and non-hazardous wastes;
- Ensuring minimal contact between hazardous waste and protective gear and sampling devices;
- Providing spill contingency and release prevention programs; and
- Minimizing wastes generated during field activities (such as sampling and drilling operations).

1.2 FACILITY DESCRIPTION AND REGULATORY BACKGROUND

The Lyndonville-West Avenue site is listed on the New York State Registry of Inactive Hazardous Waste Sites as Site No. 8-37-002 and is designated as a Class "2" site. Initial investigations conducted at the site in the late 1970s were prompted by area resident complaints of sulfurous odors emanating from storm-sewer manholes along West Avenue. Numerous investigations, described in detail in the Supplemental Environmental Assessment (SEA) Report (DuPont, CRG, 1998) have been conducted by New York State Department of Environmental Conservation (NYSDEC), Orleans County Department of Health and the United States Environmental Protection Agency between 1982 and 1993. DuPont, Monroe Electronics, Dobbins-Ramage, and Bowman Apple Products Company, Inc., were named by NYSDEC as potentially responsible parties (PRPs) for reparation of costs to investigate and remediate the site. DuPont completed the SEA for the site in 1998 and has agreed to conduct supplemental sampling to fulfill investigative requirements for remedial investigation of the site.

The site is comprised of properties in the vicinity of a landfill area owned by H.H. Dobbins and a former DuPont facility (now Monroe Electronics). Historically, Barry Lime and Sulfur manufactured lime and sulfur solution/dust mixtures at the site from the early 1920s to approximately late 1943, when the facility was purchased by DuPont. DuPont formulated agricultural sprays and dusts from 1944 to approximately 1954. Waste lime and sulfur sludge from Barry Lime and Sulfur were disposed in a landfill in the vicinity of the H.H. Dobbins facility. The landfill was also reportedly used by local fruit processors for the disposal of rotting fruit and by-products of fruit processing operations.

For the most part, the SEA soil sample results, as well as previous sampling results, have shown that low concentrations of arsenic and pesticides are widespread and likely representative of background conditions within an area which historically had been agricultural and subject to

pesticide and herbicide application. Concentrations of arsenic in soil above representative background were observed in limited topographic low areas of the drainage swale south of the former railroad line. The full extent of soils within the drainage swale with arsenic concentrations above representative background concentrations was not fully delineated by SEA sampling. Subsurface investigations conducted during the SEA in areas around the former DuPont facility and the landfill indicate that arsenic levels above background are limited to subsurface lime fill materials in the landfill where direct exposure is restricted. Elevated pesticide concentrations in the subsurface are limited. Analytical results for two composite samples from the landfill indicate that the lime fill materials would not be classified as a characteristic hazardous waste. Investigation of groundwater quality during the SEA indicate that groundwater has not been impacted by any site-related activities.

Based on data collected during the SEA, DuPont has initiated response actions to control or eliminate leachate from the landfill. A surface discharge point for the leachate was eliminated by installing an air-tight junction box in 1998. Additionally, storm drainage from areas upgradient of the landfill was diverted by blocking the existing box culvert and installing a new storm sewer connection to Main Street in 1999. The diversion of upgradient storm water flow has significantly reduced the amount of leachate generated. DuPont is also installing a leachate collection system to eliminate discharge to the storm sewer.

1.3 SCOPE

This WMP describes the procedure for managing wastes generated during the investigation and remediation activities to be conducted by DuPont Corporate Remediation Group/URS Diamond (CRG/URSD), designated subcontractors, or facility personnel. Descriptions of the waste materials and management procedures including storage, documentation, transportation, and disposal are presented.

This WMP is organized in the following manner:

- The body of the WMP (Sections 1.0 through 5.0) describes the general requirements for waste handling and disposal associated with investigation and remediation activities. Typical wastes, which will be generated during investigation activities, are described in Section 3.0.
- The appendices contain additional supplemental information such as remediation team assignments, emergency procedures, sample waste tracking forms, and project-specific waste management procedures. The appendices are arranged in the following manner:
  - *Appendix A*
    Project Team Members and Responsibilities
  - *Appendix B*
    Site Emergency Response and Spill Procedures
  - *Appendix C*
    Specific Requirements for Analytical and Treatability Samples

- *Appendix D*
  Forms and Sample Labels
- *Appendix E*
  Documentation of Listing Code Applicability
- *Appendix F*
  Soil and Leachate Characterization Form
- *Appendix G*
  Soil and Analytical Data
- *Appendix H*
  Project-Specific Waste Management Procedures for Construction Activities
- *Appendix I*
  Project-Specific Waste Management Procedures for Operating Activities
- *Appendix J*
  Project-Specific Waste Management Procedures for Investigation Activities

Subsequent appendix sections will be added as needed to describe any field activities and related waste management procedures, and to maintain any required waste management documentation (completed waste tracking forms, container generation forms, completed manifests, etc.).

2.1 INVESTIGATION TEAM ORGANIZATION

The investigation team consists of both CRG/URSD and DuPont personnel. Roles and responsibilities of the team are discussed below.

2.2 GENERAL RESPONSIBILITIES

DuPont Lyndonville –West Ave Site retains the generator responsibilities, such as reporting, final approval of waste classification, document retention, manifest review and approvals, and emergency response.

CRG shall ensure that field investigation and remediation activities are conducted in a manner that:

- Safeguards human health and the environment;
- Complies with all applicable laws and regulations;
- Meets all relevant site standards and policies; and
- Safely and effectively manages subcontractors.

CRG shall ensure that all relevant information is communicated to the field team to facilitate compliance with the facility's waste management, safety, and environmental reporting procedures.

2.3 SPECIFIC RESPONSIBILITIES

The specific project management organization and lines of responsibility of the site personnel/CRG investigation team are illustrated in Appendix A. Project-specific roles and responsibilities are described in the appendix section, which also describes specific waste management instructions for the project activities.

DuPont CRG or URSD personnel's responsibilities include:

- Administer contracts and oversee contractors such as: contract laboratory, drilling contractor, waste transport contractor, and waste disposal facility.
- Perform determination of RCRA listing code (per 40 CFR 261) applicability for each investigation area waste (URSD may provide assistance upon request by DuPont).
- Determine or review waste classification for each waste (RCRA listing and characteristic codes) and document in WMP. URSD may provide assistance upon request by CRG. Final waste classification approval will be responsibility of the generator (DuPont site personnel in most cases).
- Coordinate and oversee drilling contractor field activities.
- Coordinate drum or waste container supply.

- Procure liners, covers, etc. for waste staging.
- Label waste stockpile or containers.
- Complete "Waste Container Generation Form" for each container or stockpile and file in the WMP appendix.
- Conduct sampling and testing needed to properly characterize wastes.
- Coordinate the collection and interpretation of analytical data.
- While onsite, inspect waste accumulation areas associated with field activities periodically, document findings inspection forms (see Appendix D), and communicate with the waste coordinator situations that need correction.
- Report any releases to the environment that result from the field activities, according to the existing site response procedure.
- Review and approve the waste classification of each waste stream (as recommended by CRG).
- Inspect the hazardous waste accumulation areas weekly.
- Assist in the generation of documents and the signing of manifests.
- Retain tracking records of storage area and container activities.
- Report any releases to appropriate authorities.
- Prepare waste shipping, transportation, and disposal documentation.
- Prepare and submit required reports (related to waste management).
- Maintain required documentation.

The DuPont Lyndonville-West Ave Site project investigation, construction and remediation activities may generate the following typical wastes:

- Soil cuttings from drilling operations
- Decontamination water
- Drilling mud
- Well development and purge water
- Personal protective equipment
- Disposable sampling and analytical equipment (including plastic sheeting and bailers)
- Debris
- Construction refuse
- Remediation process waste (soils, leachate, decon fluids, used carbon)

Each waste stream generated during the investigation, construction, and remediation will be characterized to determine disposal options. Wastewater (drill fluids, decontamination water, well purge, and well development water) will be handled separately from soils and other wastes (PPE and disposable sampling debris). Drums, tanks, or tankers may be used for wastewater storage, depending on the volume and similarity of the wastes. Soils will be drummed or stored in roll-off boxes or stockpiled (depending on waste volumes) and accumulated and segregated according to the solid waste management unit (SWMU) or area of concern (AOC) of origin. Used carbon will be stored in drums. Analytical results from investigation samples will be used to characterize the waste. If no analysis is planned or if investigation sample analyses are determined not to be representative of the waste stream, then additional waste characterization samples may be required.

Characterization of waste to determine applicability of RCRA listed and characteristic codes will be accomplished by using generator (facility) knowledge, field screening techniques, and laboratory chemical analyses.

4.1 GENERATOR KNOWLEDGE

DuPont is responsible for evaluating the applicability of Resource Conservation and Recovery Act (RCRA) listing codes for waste environmental media (e.g., soil, decontamination fluids, purged groundwater) generated during field activities at the DuPont Lyndonville-West Ave Site. Prior to conducting investigation activities in a given area, the specific area will be evaluated for the applicability of RCRA listing codes. The evaluation will consist of a review of historical records that document material handling and disposal practices, chemicals handled or produced, environmental release reports, and personnel interviews where possible. This information will be used to classify waste materials properly prior to generation and disposal of the wastes. Summaries of this evaluation are included in Appendix E of this plan.

4.2 QUALITATIVE FIELD CHARACTERIZATION

CRG/URSD field personnel will perform a qualitative characterization of waste materials by observing and recording the presence or absence of staining, odors, organic vapors, free product, or any other relevant visual and instrument observations that may aid in characterizing waste materials. Field screening equipment specified in the work plan to detect hazardous constituents (e.g., photoionization detector for volatiles) will be used to aid in the qualitative field characterization. Qualitative characterization will be used in conjunction with generator knowledge to segregate suspected hazardous waste from unknown waste at the time of generation. This segregation will minimize generation of hazardous waste as well as aid in the design of composite sampling for the purpose of waste characterization.

4.3 LABORATORY CHEMICAL ANALYSIS

After accumulation, waste material will be staged until characterization and classification are complete. Analytical results of investigation samples (where applicable) will be selected to assist in waste stream characterization. Representative composite samples will be collected from waste containers and sent for laboratory analysis as required. The investigation work plan specifies the analytical requirements for suspected constituents. The project-specific waste management instructions will also specify additional analyses required to adequately characterize a waste stream or meet disposal facility acceptance requirements. The project-specific waste management instructions are designed to meet the RCRA requirements for a waste analysis plan. Additional provisions for sampling and analysis may be required by state agencies.

4.4 DOCUMENTATION OF WASTE CLASSIFICATION

CRG will document how waste classification was determined for each waste. This will include generator knowledge, qualitative field characterization information, and laboratory analytical results. This information will be included in Appendices E, H, I, and J.

The following procedures outline global waste management methods and requirements. Additional (project-specific) waste management procedures are outlined in the Appendices H, I, and J.

5.1 CONTAINMENT

All wastes generated as a result of site activities will be containerized in accordance with all applicable regulations. Containers used for transportation to off-site treatment and disposal (TSD) facilities will meet all applicable United Nations (UN) packaging specifications in accordance with Department of Transportation (DOT) requirements. The minimum requirements for containers in an accumulation area are as follows:

- Containers must be labeled according to Section 5.2 of the WMP.
- Containers used to store the waste, and their closure devices, must be leakproof and strong enough to withstand dropping, overturning, and other collisions while filled, without impairing the ability of the container to contain the waste.
- Containers (including gaskets and liners) will be compatible with the waste.
- Containers will be closed at all times except during filling or emptying to minimize the chance of leaks, spills, and emissions, as well as personnel exposure to the waste or vapors.
- The outside of the containers will be kept clean at all times to prevent personnel exposure to the waste.
- Containers will be handled and stored in a manner which prevents accidental spills and damage to the container.
- Containers will be arranged in a manner that segregates hazardous and non-hazardous waste, segregates incompatible wastes, makes identification labels visible, and facilitates an inventory.

Waste containers will be moved to a designated waste accumulation when the container has been filled and properly labeled. A record of all waste materials that are transferred to the accumulation area will be maintained by the designated waste coordinator and provided to the DuPont Lyndonville-West Ave Site environmental coordinator.

5.2 LABELING

After the waste is placed in an appropriate container and is designated for movement to the central temporary storage area, the container will be labeled with a description of contents and the accumulation start date. The following information (marked with a permanent-paint marker or an appropriate label) will be written on the container, identifying the:

- Contents
- Date the material was placed in the container
- State of the material (e.g., liquid, solid, and slurry)
- Unique sequential identification number of that container (as detailed in the paragraph that follows)
- DuPont project number, contact, and telephone number

Each container will be marked with a unique sequential identification number (i.e., IW-"A"-"BCDE"-"F"), where:

- IW represents the Investigation Waste, OW represents operating waste and RW represents Remediation Waste.
- "A" represents the container type (i.e., D = drum, E = end-dump trailer, T= tank truck, R = roll off, X = tote bin, and S = special container, as indicated on the container generation and tracking forms).
- "BCDE" represents a four-digit sequential number beginning with 1001. Containers will be numbered so that each number will be unique to a container, regardless of the container type. (Each four-digit sequential number will be used only once for investigation and/or remediation wastes in a year. The sequential number sequence will be reset to 1001 at the beginning of each year.)
- "F" represents the last digit of the year (for the year 2001 "F" will be the number zero in all remediation container codes for this project).

Each container will have a Container Generation form on file that records a description of the waste material and the origin of the waste. A Waste Management Inventory form or Container Tracking form will also be used to monitor movement in and out of the waste accumulation area.

5.3 HANDLING

Containerized materials will be moved to the designated waste accumulation area. All containers will be handled by approved handling equipment such as slings, forklift, or drum grapplers. Drums will not be handled in such a manner that they may be dropped or the contents spilled.

5.4 STORAGE AND INSPECTION

Each storage container will be appropriately labeled as outlined above. After a container has been filled, it must be moved to the designated waste accumulation area. Waste containers may be stored at the waste accumulation area until characterization and classification are completed, and may remain in this area until shipment. Containers that have not yet been properly characterized will be marked with " ON HOLD Pending Analysis" labels. Materials classified as hazardous may be stored in the waste accumulation area prior to disposal. **The accumulation period for Hazardous Waste cannot exceed 90 days from the date of generation of the waste.**

A typical drum accumulation area should be one of the following:

- Concrete pad with curbing
- Asphalt surface with curbing
- Polyethylene liner with self-curbing (liner extending over curbing to prevent leakage under curbing)
- Containers stored on secondary containment skids
- Other suitable area that is designed to contain a minimum of 10 percent of the volume of the containers or the volume of the largest container, whichever is greater

Storage areas will be inspected on a minimum weekly basis by the designated waste coordinator. The Drum Storage Pad Inspection log is included in Appendix D. A Waste Management Inventory log sheet will be maintained to track waste materials being stored in the accumulation area (see Appendix D). A record of all containers and inspections will be maintained on the inspection forms with the designated waste coordinator.

5.5 TRACKING AND DOCUMENTATION

The container tracking form will be used to track the generation of each waste container. All containers used for containing the waste will be identified using the numbering system described in Section 5.2. Waste generation reports will be created for documenting the waste generated, the drums moved to the designated waste accumulation area, and the drums taken off the "on hold" list. This information will be supplied to the DuPont Lyndonville-West Ave Site environmental coordinator at the completion of field activities and/or when the status of the waste container changes. If the CRG/URSD manages the shipment and disposal of wastes, the designated project waste coordinator will obtain copies of the hazardous waste manifests and any treatment verification documents for the project waste files and submittal to DuPont Lyndonville-West Ave Site waste coordinator. The DuPont Lyndonville-West Ave Site waste coordinator will be responsible for submitting the reports of all waste shipments to the appropriate regulatory agencies.

5.6 SHIPMENT, TREATMENT, AND/OR DISPOSAL

After waste characterization and classification are completed, arrangements will be made for shipping the waste to a DuPont-approved TSD facility. The disposal of hazardous or nonhazardous waste at a TSD facility is subject to RCRA solid waste regulations and the disposal facility acceptance criteria. Waste containers will be shipped to the TSD facility by a transporter approved by the DOT and DuPont. All wastes that are classified as RCRA hazardous will be shipped with the required hazardous waste manifest.

Candidate disposal facilities for both hazardous and non-hazardous wastes are presented in the Appendices H, I, and J which describe project-specific waste management procedures. In most cases, waste generated from analytical samples will be properly handled and disposed of by the laboratory (the laboratory becomes the generator of these wastes). If a laboratory will not dispose of analytical sample wastes, arrangements must be made for proper disposal upon return of the unused portions of the analytical samples.

RCRA regulations provide the following three options for off-site treatment and/or disposal of waste: wastewater treatment, landfill, and incineration.

In order to adopt any of the above methods, additional characterization may be required. Contact the contract laboratory for any additional required characterization specified by RCRA.

The Waste Management Inventory form used to track compliance with the 90-day limit of each hazardous waste container is presented in Appendix D. In most cases, the site environmental coordinator or designee will fill out, sign, and retain copies of the hazardous waste manifests and any treatment verification documents for the project waste files. In cases where the CRG/URSD is designated as the generator, CRG/URSD personnel (or DOT-trained designate) will complete the manifest prior to approval and signature by the appropriate CRG/URSD personnel with signatory authority (as determined by DuPont management). DOT-trained personnel at the site will assist in assigning any additional DOT placarding needed for hazardous waste shipment.

If CRG/URSD manages the shipment and disposal of wastes, copies of the waste manifest, LDR forms, and any treatment verification forms will be submitted to the DuPont Lyndonville –West Ave Site environmental coordinator for their waste records. DuPont CRG/URSD will also retain a copy of all waste management documentation in the project files and in the appendix of the WMP. Appropriate site personnel will be responsible for submitting the reports of all waste shipments to the appropriate regulatory agencies.

6.1 PURPOSE

This section addresses procedures to be employed in the event that a waste or hazardous-constituent release occurs during the course of conducting the facility investigation and remediation.

A list of materials and hazards associated with those materials are identified in the Health and Safety Plan (HASP) for the site. Potential exposure to personnel and the safety procedures to be adopted while conducting the investigation on remediation activities are also covered in the HASP.

A list of key emergency personnel is provided in the HASP and the Site Contingency Plan. A copy of the Site Contingency Plan (or excerpt with relevant information) is included in Appendix B.

6.2 CONTINGENCY PLAN AND REPORTING

The purpose of this plan is to define the procedures to minimize the hazards to human health and/or to the environment in the event that a waste or hazardous-constituent release (i.e., a spill or gaseous release) occurs.

The provisions of this plan must be carried out immediately whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents.

DuPont CRG. 1999. *Supplemental Remedial Investigation (SRI)/Focused Feasibility Study (FFS) Work Plan,* Lyndonville-West Avenue Site, Lyndonville New York.

_____.1998. *Supplemental Environmental Assessment Report.* Lyndonville-West Avenue Site, Lyndonville, New York.

TABLES

TABLE 1
Anticipated Construction Activities Waste Streams
DuPont Lyndonville-West Ave site

Waste Stream	Proposed RCRA Classification	Anticipated Testing	Container Requirements and Estimated Volume	Labeling Requirements	Anticipated Disposal Method
Soil and Construction Debris	Non-hazardous	See Appendix G: Soil & Analytical Data	One 20-yd roll-off box.	"On-hold Pending Analysis," Date Containerized, Write unique container number on top third of drum. See section 5.2 of WMP.	Sending to CWM Chemical Services Model City Landfill.
Decontamination Water	Nonhazardous	None	Two 55-gallon drums	"Nonhazardous"- Decon water. See section 5.2 of WMP.	Water treatment facility owned by the municipality of Niagara Falls or by CECOS
PPE	Nonhazardous	None	Added to 20-yd roll-off box.	"Nonhazardous" See section 5.2 of WMP.	Sending to CWM Chemical Services Model City Landfill.

TABLE 2
Anticipated Operating Waste Streams
DuPont Lyndonville-West Ave Site

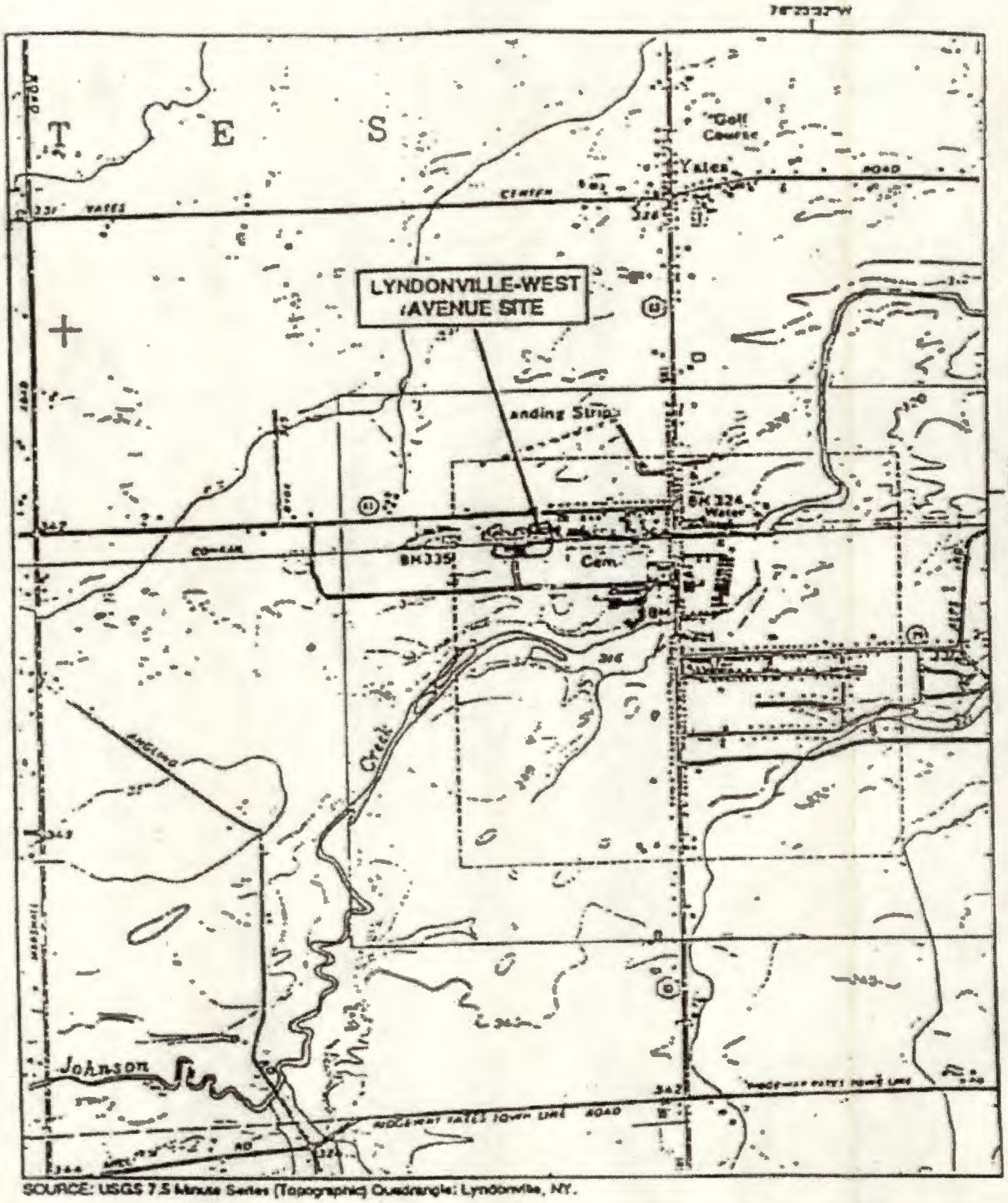
Waste Stream	Proposed RCRA Classification	Anticipated Testing	Container Requirements and Estimated Volume	Labeling Requirements	Anticipated Disposal Method
Waste Stream No. 1-Leachate	Non-RCRA	See Table Appendix G: Soil & Analytical Data	Pretreatment tank 400,000-800,000 gallons	Non-Hazardous See section 5.2 of WMP.	Water treatment facility owned by the municipality of Niagara Falls or by CECOS.
Waste Stream No. 2-Carbon	TBD	TCLP Organics & Total Sulfide	55-1A1/1A2 drum (3-12 drums annually)	See section 5.2 of WMP.	Send back to Calgon Carbon for recycle.

TABLE 3
Anticipated SRI Waste Streams
DuPont Lyndonville-West Ave Site

Waste Stream	Proposed RCRA Classification	Anticipated Testing	Container Requirements and Estimated Volume	Labeling Requirements	Anticipated Disposal Method
Groundwater	Non-RCRA	See Appendix G: Soil & Analytical Data	55-1A1/1A2 drum (1-2 drums)	Non-Hazardous See section 5.2 of WMP.	Water treatment facility owned by the municipality of Niagara Falls or by CECOS.
Decontamination Water	Nonhazardous	None	Two 55-gallon drums	Nonhazardous-Decon water. See section 5.2 of WMP.	Water treatment facility owned by the municipality of Niagara Falls or by CECOS
Soil Media	Nonhazardous	See Appendix G: Soil & Analytical Data	Two 55-gallon drums	Nonhazardous-See section 5.2 of WMP.	Sending to CWM Chemical Services Model City Landfill.

JGS
10/16/00

FIGURES



SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangle: Lyndonville, NY.

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QUADRANGLE LOCATION

SOURCE: U.S.G.S. 7.5 MINUTE SERIES (TOPOGRAPHIC) QUADRANGLE: LYNDONVILLE, N.Y.

FIGURE 1

SITE LOCATION MAP

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DATE 5/2/96	CHECKED	APPROVED	PROJECT NO 3851

DUPONT

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
LYNDONVILLE-WEST AVENUE SITE
LYNDONVILLE, NEW YORK

DuPont Environmental Remediation Services

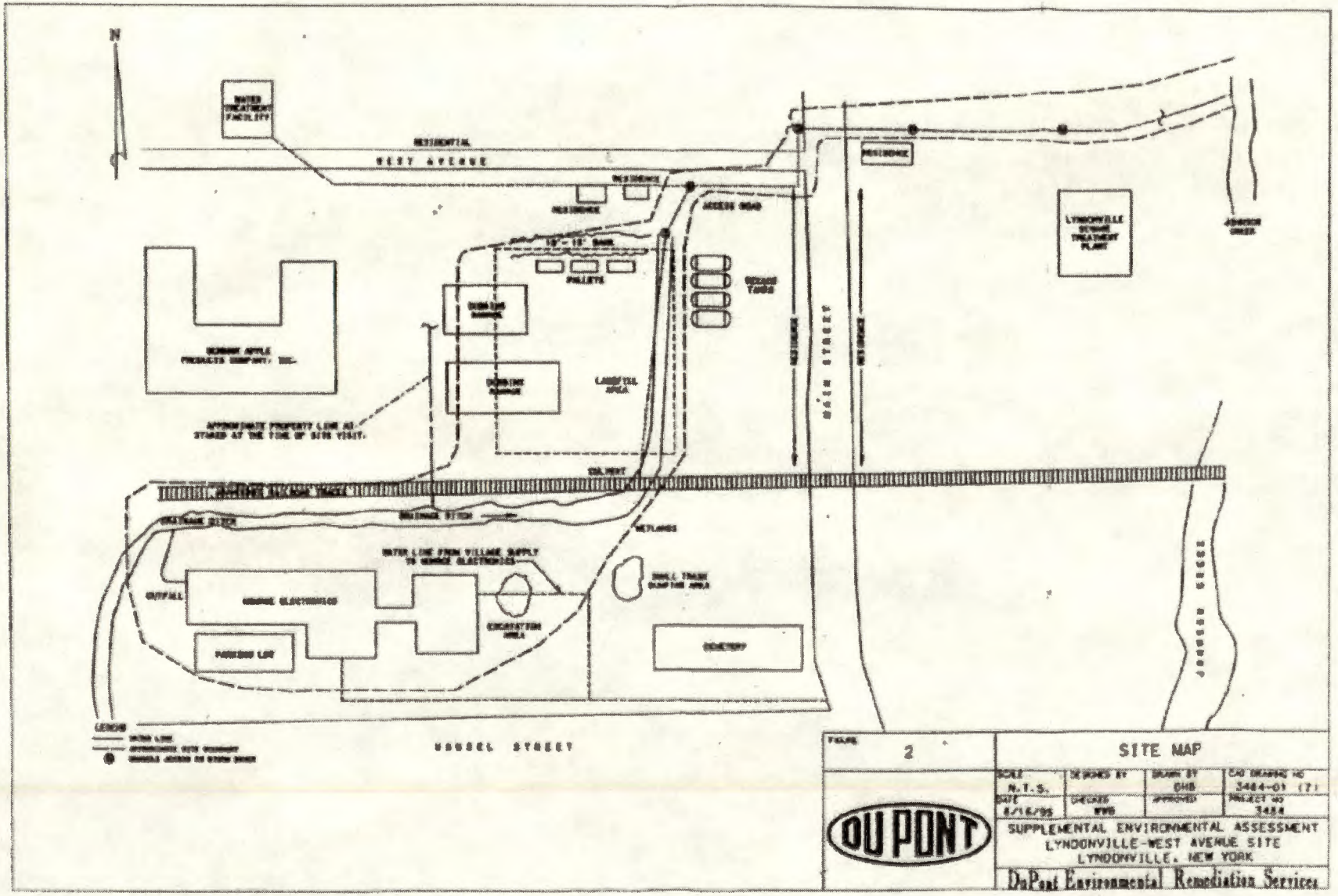

FIGURE 2	SITE MAP		
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DATE 8/16/95	CHECKED RWB	APPROVED	PROJECT NO 3484

DUPONT

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
LYNDONVILLE-WEST AVENUE SITE
LYNDONVILLE, NEW YORK

DuPont Environmental Remediation Services

APPENDICES

APPENDIX A

PROJECT TEAM MEMBERS AND RESPONSIBILITIES

Table A-1
DuPont Lyndonville-West Ave Site

CONSTRUCTION PROJECT RESPONSIBILITIES

Task	Organization	Individual
Conduct waste coordinator duties (unless specified elsewhere).	URS Diamond (URSD)	J. G. Sykes
Oversee waste management activities.	URSD	J. G. Sykes
Coordinate sampling activities.	URSD	D. Sheldon
Select and oversee waste transportation and disposal contractors. Selection Oversight	 DuPont DuPont or Designate	 J. G. Sykes
Coordinate contract laboratory.	URSD	D. Sheldon
Review analytical data and submit data to site environmental coordinator for waste characterization determination.	DuPont or URSD	J. G. Sykes
Mark containers.	URSD	D. Sheldon
Complete container generation forms and waste tracking forms and submit to site waste coordinator.	URSD	J. G. Sykes
Evaluate pertinent information to determine applicability of listing codes to each investigation area (only as needed).	DuPont or URSD as requested by DuPont	Jason G. Sykes/ D. Spanfelner/ P. Mazierski
Evaluate analytical data to determine RCRA classification (characteristic codes for each waste stream).	DuPont or URSD as requested by DuPont	J.G. Sykes/ D. Spanfelner/ P. Mazierski
Recommend waste characterization for each waste stream.	URSD **only if** requested by DuPont	J. G. Sykes
Review and approve recommended waste characterization for each waste stream.	DuPont	J. G. Sykes
Monitor and approve movement of waste into the waste accumulation area (drums).	DuPont	D. Sheldon
Inspect container and accumulation area weekly.	DuPont or URSD as requested by DuPont	D. Sheldon
Prepare shipping papers (i.e., manifests and LDR forms).	DuPont or URSD as requested by DuPont	D. Sheldon/J.G. Sykes
Prepare/submit related reporting and maintain all required documents.	DuPont	D. Sheldon

JGS
10-12-00

APPENDIX B

SITE EMERGENCY RESPONSE AND SPILL PROCEDURES

DUPONT LYNDONVILLE-WEST AVENUE SITE- LYNDONVILLE, NY
RELEASE REPORTING AND RESPONSE REQUIREMENTS

These procedures have been written expressly to cover the field activities to be conducted by DuPont or its designated subcontractors at the DuPont Lyndonville-West Avenue-West Avenue site, located in Lyndonville, New York.

Release reporting and response will take place in a manner protective of human health and the environment and will comply with all applicable laws and regulations, as well as DuPont standards and policy. The provisions of this plan must be carried out immediately whenever there is a fire, explosion, or hazardous substance release that could threaten human health or the environment.

1.0 CONTACT NAMES AND PHONE NUMBERS

In the event that a release occurs, the following contacts will be made, as appropriate:

1.1 Internal DuPont and CRG Reporting

Name	Location	Telephone
Daniel Sheldon (Project Manager)	Buffalo Ave & 26 th Street Niagara Falls, NY	(716) 278-5170
Joseph McCarthy (Project Manager)	Lancaster Pike & Route 47 Wilmington, DE	(302) 992-6904
Paul Mazierski* (DuPont CRG Project Director)	Buffalo Ave & 26 th Street Niagara Falls, NY	(716) 278-5496

* Paul Mazierski, DuPont CRG Project Director, will make appropriate reporting within the CRG organization.

1.2 Agency Reporting

The following agencies shall be notified as necessary by Paul Mazierski.

Name	Telephone
USEPA- National Response Center	(800) 424-8802
LEPC – Orleans County Emergency Planning Office-Paul Wagner	589-4414 or 589-5527 or 911
New York Department of Environmental Conservation 24-hour New York Release Reporting number, if different from above	1-800-457-7362

2.0 REPORTING REQUIREMENTS

All environmental releases shall be reported **immediately** to internal DuPont CRG and URSD contacts, as listed above. In the event that personnel safety and/or release containment is required, take appropriate action to safeguard human health and the environment. Reporting requirements for hazardous substances vary in type (i.e., air, water, or surface releases) and quantity released of a given chemical. Therefore, prior to implementing site activities, specific reporting requirements will be established for each identified hazardous substance that will be used during site activities or is known to be present or potentially generated as a waste. After establishing specific reporting requirements, the agency contact list may be revised and communicated to the project team prior to site activities.

2.1 Reporting Requirements- Federal Regulations

Should a release occur of any other hazardous substance onto the ground, surface water, or air, it should be appropriately reported. Notification to internal DuPont contacts must occur in a timely manner to ensure no agency reporting is required. Other hazardous substances include, but are not limited to: gasoline, diesel fuel, and any oil (e.g., motor oil, lubricating oil).

Table B-1 of this appendix shows the reportable quantities for the constituents anticipated (either used or present in media to be sampled or handled) during the field activities.

2.2 Reporting Requirements- State of New York

Federal

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or "Superfund") requires the owner or operator of a facility which has experienced a spill or release into the environment (i.e., discharge) of certain quantities of harmful substances to immediately place a call to the National Response Center to inform federal authorities of the incident.

Under Title III of the Superfund Amendments and the Reauthorization Act of 1986 (SARA or Emergency Planning and Community Right-to-Know Act of 1986), a list of "extremely hazardous substances" with corresponding reportable quantities (RQ) was developed. Should a spill, leak, or release enter the environment (i.e., discharge) from the facility that equals or exceeds the applicable RQ and has the potential for off-site impact, a spill report must be made immediately to the State Emergency Response Commission, the local emergency coordinator for the Local Emergency Planning Committee, and the National Response Center, as stated above.

The Clean Water Act (CWA) reporting requirements are presently superseded by State water pollution permits and Publicly Owned Treatment Works (POTW) permits.

The Clean Air Act (CAA) reporting requirements are presently superseded by state air permits.

Under Navigational Laws, any spill or release of any petroleum product into the navigable waters must be reported to the National Response Center immediately.

State

Under NYS Chemical Bulk (CBS), all releases that enter the environment from a facility in an amount that equals or exceeds the applicable RQs must be reported to the Spill Hotline within two hours. The release is reportable if it exceeds a New State RQ whether or not it was released from a CBS tank or system.

Under NYS Petroleum Bulk Storage (PBS) petroleum spills and releases from a facility in an amount that equals or exceeds the applicable RQs must be reported to the Spill Hotline within two hours.

Under State Pollution Discharge Elimination System (SPEDES), spills and releases that exceed permit parameters must be reported to the POTW; those not covered by the permit must be reported to the NYSDEC.

Under State Air Pollution Regulations, spills and releases that exceed a permit parameter must be reported to the NYSDEC and OCHD.

Table B-1

REPORTABLE QUANTITIES (RQ) FOR ANTICIPATED CONSTITUENTS

Constituent	RQ (pounds)	Regulation	Comments
(Example): Ethylene glycol	1000	40 CFR 302 CERCLA	
Petroleum products (fuels, hydraulic fluids)	Cannot cause a sheen on the surface of the water. Cannot violate applicable water quality standards. Cannot cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shoreline.	40 CFR 110 CWA	Petroleum product spills to the ground must be reported to Spill Hotline.

APPENDIX C

SPECIFIC REQUIREMENTS FOR ANALYTICAL AND TREATABILITY SAMPLES

Specific Requirements for Analytical and Treatability Samples

1.0 Analytical Samples

An analytical sample is a sample of solid waste, water, soil, or air collected for the sole purpose of testing to determine its characteristics and/or composition. These samples are typically less than one gallon and can be analyzed for both chemical and physical parameters. Analytical samples are not subject to the requirements of RCRA Parts 124, 261 - 268, and 270, or to the notification requirements of Section 3010 when the sample is being:

- Transported to a laboratory for the purpose of testing;
- Transported back to the sample collector after testing;
- Stored by the sample collector before transport to a laboratory for testing;
- Stored in a laboratory before testing;
- Stored in a laboratory after testing but before being returned to the sample collector; and/or
- Stored temporarily in the laboratory after testing for a specific reason (e.g., until conclusion of a court case or enforcement action where further testing of the sample may be necessary).

A sample collector shipping samples to a laboratory and a laboratory returning samples to the sample collector must comply with the Department of Transportation (DOT), the United States Postal Service, and/or other applicable shipping requirements. If the sample collector determines that the DOT, the United States Postal Service, and/or other applicable shipping requirements do not apply, the sample collection must ensure that the following information, at a minimum, accompanies the sample:

- Sample collector's name, mailing address, and telephone number;
- Laboratory's name, mailing address, and telephone number;
- Date of shipment;
- Quantity of sample(s);
- Description of sample(s); and
- CRG project number.

This information will be documented on the shipping label, traffic reports (TRs), and chain-of-custody forms (COCFs). The TRs and COCFs must be packaged with the samples for shipment to the laboratory in a sealed plastic bag to prevent damage. If the samples are to be returned to the site for disposal, copies of the TRs and COCFs will be given to the environmental coordinator for the project waste management files.

Samples must be packaged in a manner to prevent leaks, spills, or vapors from their packaging. Sample containers will be cleaned prior to packaging to prevent contact with the sample material. Each sample container will then be labeled with the following information:

- Sample name,
- Date and time of collection,
- Preservatives used,
- TR number, and
- CRG project number.

This information will enable the environmental coordinator to identify the samples at a later date. Sample containers will be placed inside a dedicated plastic bag filled with ice. The plastic bag containing ice and sample containers will be placed into a shipping container, such as a cooler. The shipping container will then be filled with a nonflammable, shock absorbent material to absorb any liquids that might leak from the sample containers and protect the sample containers from being damaged. (Vermiculite is an excellent packing material.) The shipping container will be packed in a manner that prevents the shifting of the over-packed containers.

The sample packing requirements are necessary when transporting samples via delivery service organizations such as Federal Express. Should the shipping container leak, the individual whose name appears on the shipping form will be notified immediately. The shipping container will be dropped off at the next stop, and the individual will be required to claim the shipping container in person. Copies of the shipping documents must be given to the environmental coordinator for the project waste management file. Samples cannot be transported on commercial mass transit vehicles such as passenger airplanes, trains, or buses.

2.0 Treatability Samples

Treatability samples are samples collected for the sole purpose of conducting treatability studies as defined in RCRA 40 CFR 260.10. These samples are not subject to any requirements of RCRA 40 CFR 261 through 263, or the notification requirements of Section 3010 of RCRA when the sample is being:

- Collected and prepared for transportation by the generator or sample collector;
- Accumulated or stored by the generator or by the sample collector prior to transportation to a laboratory or testing facility; or
- Transported to the laboratory or testing facility for the purpose of conducting a treatability study.

The following quantities are based on the Final Rule published on February 23, 1994, in 59 FR 8362, which modifies 40 CFR 261.4. Please note that previously authorized state regulatory agencies may not yet have adopted this new rule. State regulations should be reviewed prior to taking samples for treatability studies.

The exclusions apply to samples of hazardous waste provided that:

- The generator or sample collector uses (in treatability studies) no more than 10,000 kilograms of media contaminated with non-acute hazardous waste, or no more than 2,500 kilograms of media contaminated with acute hazardous waste. [Note: Acute hazardous wastes are all of the P-listed wastes and specific F-listed wastes containing dioxins and furans (F020-23 and F026-28)];
- The mass of each sample shipment does not exceed the following limits: 1,000 kilograms of "as received" hazardous waste, 1 kilogram of acute hazardous waste, or 250 kilograms of soil, water, or debris contaminated with acute hazardous waste;
- The same shipping requirements as for analytical samples are met (including the EPA hazardous waste number, if applicable);
- The sample is shipped to a laboratory or testing facility that is exempt under RCRA 40 CFR 261.4(f) or has an appropriate RCRA permit or interim status.

Additional quantities of treatability sample may be requested by providing specific information to the appropriate lead regulatory agency in writing.

The same packaging requirements described for analytical samples apply to treatability samples. However, treatability samples are typically larger in volume, and may consist of several 55-gallon drums. The sample collector will not place sample material directly into a 55-gallon drum. Sample material will be placed into a smaller container and then placed into a larger shipping container with packing material as described for analytical samples. This is necessary because these samples will be shipped via a standard freight company or delivery service organization and not a licensed hazardous waste transporter. Shipping containers that weigh more than 150 pounds need to be shipped via a standard freight company. TRs and COCFs must accompany the shipment to the laboratory or testing facility. In addition to the standard TR information, the mass quantity and technology being evaluated must be clearly stated on the TR. Copies of the TRs, COCFs, and shipping documents will be given to the environmental coordinator for the project waste management file.

APPENDIX D

FORMS AND SAMPLE LABELS

WASTE MANAGEMENT CHECKLIST
BEFORE STARTING FIELD WORK

	Y&N	Responsible Person
Has the Site Waste Management Plan and Project Waste Management Plan been prepared and are there copies available for all field personnel? Have waste management field personnel read the Waste Management Plan(s)?		
Has waste handling and container on-site transportation equipment been coordinated?		
Has drum or container supply been coordinated?		
Are 'On Hold - Awaiting Analysis' labels available for containers?		
Is the waste listed? If so, do you have 'Hazardous Waste' container labels?		
Do you have container generation forms?		
Do you have container tracking forms?		
Have the field personnel responsible for labeling and tracking waste and providing documentation to appropriate site waste management personnel been identified?		
Has a waste accumulation area been designated?		
Has the waste accumulation area been set up for double containment of waste (i.e., drum containment skids or plastic sheeting under containers)?		
Have the field personnel responsible for inspection of the waste accumulation area been identified?		
Has the person responsible for waste characterization sampling been identified?		
Has the Waste Sampling And Analysis Plan been completed?		
Has the waste analytical laboratory been contracted and sample shuttles ordered?		
Have off-site transport and disposal companies been identified? Company names?		
Has the coordinator of off-site transportation and disposal been identified? W that person also coordinate all sh ipping and disposal documentation? Is that person DOT trained?		
Has the person that will review analytical data and summarize waste characterization been identified?		
Has the person that will characterize the waste been identified?		
Has the person or persons to contact in case of a spill been determined?		

Waste Container Generation Form

ID# _____ NAME _____

CONTAINER # _____

DESCRIPTION OF MATERIAL: _____

ACCUMULATION START DATE: _____ SAMPLE DATE: _____

SITE LOCATION: _____

PURPOSE OF GENERATION: _____

ESTIMATED QUANTITY: _____ ONE TIME TREATABILITY SAMPLES
CONTINUOUS Y N

ESTIMATED DISPOSAL DATE: _____

ACTUAL DISPOSAL DATE: _____

REQUIRED LABEL:

_____

_____

_____

CONTENTS:

_____

_____

_____

_____

_____

_____

90 Day Accumulation Area

HAZARDOUS WASTE INSPECTION REPORT

Items to be Inspected Weekly	Results		Corrective Action	
	Present	Not Present	Needed	Date Accomplished
Fire Extinguisher (Inspected)		○		
Good Housekeeping		○		
Proper Tagging of Waste		○		
Aisle Space		○		
Secondary Container		○		
Good Container Condition		○		
Open Container	○			
Incompatible Waste	○			
Storage Limit Exceeded	○			
Leaks or Spills	○			
Odors	○			
Sump Condition Debris/Liquid	○			
Pad Deterioration (Concrete/Dikes)	○			
Waste Solvent Drums Grounded		○		

Note: All checks within circles must be addressed under "Corrective Action."

Signature of Inspector:______________________________ **Date:**__________

DAE D SE CTN SE

* *

Description of Problem:____

____

____

Action Taken:____

____

Completion of Remedial Action Date:_ Verified by:_

Drum Accumulation Pad Inspection Log

Date:_____ Time:_

Inspector Name and Title: _ _

Equipment	Check List	OK (√)	Comments
Containers	Corrosion, leakage, structural damage		
Container Sealing	Open lid, rings, bung caps		
Container Labels	Improper identification, date missing		
Segregation of Incompatibles	Storage of incompatibles		
Container Stacking	Aisle space, Height		
Pallets	Damaged, drums not on pallet		
Base or Foundation	Cracks, spelling, erosion, wet spots		
Warning Signs	Damaged, missing		

REMEDIAL ACTIONS

_	_
_	_
_	_
_	_
_	_
_	_
_	_
_	_
_	_
_	_
_	_

Waste Characterization Form

Date: _____ Waste ID Number: _____
Rev/Exp. Date: _____ Disposal Acct: _____

Generator Profile:

Generator: _____
US EPA ID: _____ State ID: _____
Address: _____
Site Contact(s): _____
Phone: _____ Fax: _____

Waste Identification:

Waste Name: _____
Process generating waste: _____
State Waste ID No.: _____ (Specify state: _____)
List all EPA hazardous waste codes: _____
_____
_____
_____
List all state hazardous waste codes: _____
_____
_____ (Specify state: _____)

Is waste from a Superfund cleanup?	____ Yes	_____ No	
Is waste TSCA-regulated?	____ Yes	____ No	Describe: _____
Is waste FIFRA-regulated?	____ Yes	____ No	Describe: _____
Is waste NESHAPS-regulated?	____ Yes	____ No	Compound/Conc: _____

Chemical Composition Breakdown _____ (Include all constituents 1% or 0.1% for carcinogens, or 100 ppm for Appendix VIII).

Major Constituents	Range		Typical	Detection Limit (SW846)	Units (% or ppm)
_____	____	_____	_____	_____	_____
_____	____	_____	_____	_____	_____
_____	____	_____	_____	_____	_____
_____	____	_____	_____	_____	_____
_____	____	_____	_____	_____	_____
_____	____	_____	_____	_____	_____
_____	____	_____	_____	_____	_____
_____	____	_____	_____	_____	_____
_____	____	_____	_____	_____	_____
Dioxins/Furans	____	_____	_____	_____	_____
PCB	____	_____	_____	_____	_____
Water	____	_____	_____	_____	_____
Total			100%		

How was the waste composition determined?

_____ TCLP _____ Totals Analysis _____ Process knowledge _____ Combination _____ Other

Waste Characterization Form
(continued)

Trace Constituents: (Provide detection limits if not detected.)

Constituents	Range		Typical	Detection Limit (PPM)
Antimony (Sb)	_____	_____	_____	_____
Arsenic (As)	_____	_____	_____	_____
Barium (Ba)	_____	_____	_____	_____
Beryllium (Be)	_____	_____	_____	_____
Cadmium (Cd)	_____	_____	_____	_____
Chromium (Cr)	_____	_____	_____	_____
Chromium (Cr6)	_____	_____	_____	_____
Iron (Fe)	_____	_____	_____	_____
Lead (Pb)	_____	_____	_____	_____
Mercury (Hg)	_____	_____	_____	_____
Nickel (Ni)	_____	_____	_____	_____
Selenium (Se)	_____	_____	_____	_____
Silver (Ag)	_____	_____	_____	_____
Thallium (Tl)	_____	_____	_____	_____
Vanadium (V)	_____	_____	_____	_____

How were the waste's trace constituent concentrations determined?

_____TCLP _____Totals Analysis _____Process knowledge _____Combination _____ Other

Have additional waste analysis data been attached? _____ Yes
_____ No

Have all Appendix VIII compounds been listed/considered? _____ Yes
_____ No

Is this a California-listed waste? _____ Yes
_____ No

Are insecticides, pesticides, herbicides, or rodenticides present in the waste? _____ Yes
_____No

Physical Description:

Describe physical form: _____
Describe color: _____
Describe odor: _____
Describe layers/specifications: _____
Is waste a wastewater (<1% TOC & <1% TSS)? _____ Yes _____ No
Does waste contain liquids per the paint filter test? _____ Yes _____ No
Is waste a soil and/or debris? _____ Yes _____ No
Debris category: _____

General Physical Properties

	Range		Typical	Units
pH Value	_____	_____	_____	pH units
Flash Point	_____	_____	_____	_____
Viscosity	_____	_____	_____	_____
%Free Liquids	_____	_____	_____	Volume %
Spec. Gravity	_____	_____	_____	_____

Waste Characterization Form
(continued)

DOT Shipping Information:

CERCLA reportable quantity: _____ Marine pollutant? _____ Yes _____ No

DOT hazardous material shipping description: _____

_____

_____

Hazard class or division: _____ Subsidiary hazard class or division: _____

Packing group: _____ DOT Placards: _____

DOT labels: _____ DOT Marking: _____

DOT *Emergency Response Guidebook* Reference Number _____

Container pressure: _____ Units: _____

For rail shipments, STCC Number: _____

Shipping Volume:

Volume of each shipment (specify units): _____

Frequency of each shipment: _____ Estimated annual volume: _____

Container type/volume: _____

Container material of construction: _____

Type of absorbent/packing material: _____

Special Waste Handling Information:

Has a waste-specific MSDS been attached? _____ Yes _____ No

Has a combination of component MSDS been attached? _____ Yes _____ No

Check all that apply and describe under Generator's Comments .

_____ Air reactive	_____ Carcinogen (or suspect)
_____ Water reactive	_____ Dust hazard during handling
_____ Explosive/shock-sensitive	_____ Oxidizer
_____ Pyrophoric	_____ Reactive cyanide or sulfide
_____ Radioactive or mixed waste	_____ Poison inhalation hazard (DOT)
_____ Biological or infectious	_____ Corrosive

Generator's Comments:

Certification Statement:

I certify that the information provided in this document is true, accurate, and complete to the best of my knowledge.

_____ _____ _____

Printed/Typed Name Signature (or note "on file") Date

Wastewater Treatment Addendum

Handling

Is this waste HON-regulated?	____ Yes	____ No	Category Group: _____
Is waste an emulsion?	____ Yes	____ No	Describe: _____
Is waste water miscible?	____ Yes	____ No	Describe: _____
Does waste have multiple liquid phases?	____ Yes	____ No	Describe: _____
Does waste contain surfactants?	____ Yes	____ No	Describe: _____
Can waste be pumped/poured at ambient conditions?	____ Yes	____ No	Describe: _____
Can heating improve flow?	____ Yes	____ No	____ Not recommended ____ Unknown
Would waste clog 1/8" nozzle/filter?	____ Yes	____ No	____ No solids ____ Unknown

Additional Trace Constituents (Provide detection limit if not detected)

	Range		Typical
Cobalt (Co)	_____	_____	_____
Copper (Cu)	_____	_____	_____
Manganese (Mn)	_____	_____	_____
Molybdenum (Mo)	_____	_____	_____
Sodium (Na)	_____	_____	_____
Zinc (Zn)	_____	_____	_____

Incinerators, Boilers, and Industrial Furnaces Addendum

Handling:

Is waste a Lab Pack per 40 CFR 268? ____ Yes ____ No _____ Organic _____ Organometallic

Can waste be pumped/poured at ambient conditions? ____ Yes ____ No

Can heating improve flow? ____ Yes ____ No ____ Not recommended ____ Unknown

Will waste clog 1/8" nozzle/filter? ____ Yes ____ No ____ No solids ____ Unknown

Thermal Treatment Properties:

	Range		Typical	Units
Boiling Point	_____	to _____	_____	_____
Moisture (%)	_____	to _____	_____	wt. %
Ash (%)	_____	to _____	_____	wt. %
Heating Value	_____	to _____	_____	BTU /lb
Vapor Pressure	_____	to _____	_____	_____

Halogen Composition:

	Elemental	Total Halide	Total Organic Halide
%Chlorine	_____	_____	_____
%Fluorine	_____	_____	_____
%Bromine	_____	_____	_____
%Iodine	_____	_____	_____

How were these values determined?

Ultimate analysis: _____

Calculation/balance _____

Other _____

APPENDIX E

DOCUMENTATION OF LISTING CODE APPLICABILITY

APPENDIX E

Documentation of Listing Codes

The applicability of listing codes for waste environmental media (e.g., soil, sediments, groundwater) resulting from site remedial activities is not clearly defined under RCRA. Soil, sediments and groundwater derived from investigations or other field activities are "inherently non-waste like" and are by definition **not** solid wastes. However, the agency's contained-in interpretation insists that management of contaminated media be as hazardous waste if it contains a listed waste. Management of the waste media as hazardous continues until the media no longer contains the listed waste or is delisted.

Based on available documentation, the applicability of any RCRA listing codes to potential waste environmental media generated via field activities (such as soils, sediments, and/ or groundwater cannot be substantiated. Therefore, URSD recommends that no RCRA listing codes apply to the waste environmental media generated at the DuPont Lyndonville-West Ave site.

APPENDIX F

SOIL & LEACHATE CHARACTERIZATION FORMS

WASTE CHARACTERIZATION FORM (WCF)

Date July 8, 1998

I. Location Lyndonville-West Avenue Site
EPA ID # Not applicable
EPA Code Not applicable
Contractor's Code
DuPont Code LYN001
State Code

II. Name of Waste Non-hazardous excavated soil

III. Composition

A. Major Components	C. One Time or Typical Analysis	D. Concentration Range Upper	Lower	E. Exposure Limits *ACGIH	*OSHA
1. Surface soil (silt/clay/loam/roots)	90%				
2. Shredded tree limbs, wood debris	9.5%				
3. PPE (polycoat tyvek suits, gloves)	0.5%				
4.					
5.					

B. Trace Components not listed above (PPM)

Ag <0.02* As 0.031* Ba 0.55* Cd <0.01* Cl* 0.000 Ca 0.000 Cr <0.02*
Cu 65* F* 0.000 Hg <0.0002* I* 0.000 N* 0.000 Ni 13* P* 0.000
Pb <0.1* S* 0.000 Se <0.2* Zn 217* CR+6 0.000 Tl 0.000

Other DDT/DDD/DDE: total concentration in soil <1 mg/kg

Indicate Test Method:
TCLP X (results with superscripted x) TOTAL METALS X (results with superscripted y)

F. Does the waste contain:

Sulfides	NO
Cyanides	NO
PCBs	NO
Phenolics	NO
**Dioxin	NO
**Listed Solvent	NO
***Halogenated Organic Compounds 100 mg/l	NO
Insecticides, pesticides, herbicides, or rodenticides	YES

IV. Physical State @ 25°C STABLE SOLID

- Is there a dusting hazard if containers are opened? NO
- Multiple Phases? NO Vol. % of each phase 100 % Solid % Liquid
- Can the waste be pumped? NO poured? NO
- % Free flowing liquid layer 0 (volume %)
- Pressure of container 0 (psig)
- % Separate phase water 0 Estimated Specific Gravity

V. Shipping Containers
Bulk total of three 20 cuyd liner boxes Container Spec.

Non-Bulk Size	Materials of Const.	Container Specification	Approx. Weight per Container	Container Label Used
NA				

VI. Properties

Flash Point °F (closed cup) Btu/lb Corrosive NO OSHA Carcinogen NO
Color Brown/tan/black pH Radioactive NO
Odor Possible slight sulfur odor Pyrophoric NO Etiological NO
Reactive NO Explosive NO
Toxic NO Shock Sensitive NO
Other

VII. D.O.T. Shipping Description NON-HAZARDOUS EXCAVATED SURFACE SOILS

D.O.T. Hazard Classification NOT DOT OR EPA REGULATED EPA Haz. Subst. NO RQ
D.O.T. Placard D.O.T. Label U.N. No. N.A. No.

VIII. Volume Annual Volume This Request Volume Per Shipment

IX. Remarks (Treatment of Spills/Safety Suggestions/MSDS)
No anticipated hazard or nuisance problems. Avoid direct contact between soil and exposed skin or dust inhalation

*Organically bound **As defined in 40 CFR 261.31
***Per 40 CFR 261.1 and 40 CFR 268 App III

Prepared by Paul J. Mazzeo 7/8/98

WASTE CHARACTERIZATION FORM (WCF)

Date 10/17/00

I. Location DuPont Lyndonville
EPA ID #
EPA Code
Contractor's Code
DuPont Code LYN-LEA
State Code

II. Name of Waste Leachate

III. Composition

A. Major Components	C. One Time or Typical Analysis	D. Concentration Range Upper	D. Concentration Range Lower	E. Exposure Limits *ACGIH	E. Exposure Limits *OSHA
1. Leachate	100%				
2.					
3.					
4.					
5.					

B. Trace Components not listed above (PPM)

Ag ____ As ≤1 ppm Ba ____ Cd ____ Cl* ____ Cn ____ Cr ____
Cu ____ F* ____ Hg ____ I* ____ N* ____ Ni ____ P* ____
Pb ____ S* ____ Se ____ Zn ____ CR+6 ____ Tl ____
Other

Indicate Test Method:
EPTOX/TCLP ____ TOTAL METALS X

F. Does the waste contain:

Sulfides	Yes
Cyanides	No
PCBs	No
Phenolics	No
**Dioxin	No
**Listed Solvent	No
***Halogenated Organic Compounds 100 mg/l	No
Insecticides, pesticides, herbicides, or rodenticides (see attached analysis)	Yes

IV. Physical State @ 25°C

- Is there a dusting hazard if containers are opened? No
- Multiple Phases? No Vol. % of each phase ____ % Solid 100 % Liquid
- Can the waste be pumped? Yes poured? Yes
- % Free flowing liquid layer 100 (volume %)
- Pressure of container 0 (psig)
- % Separate phase water 100 Estimated Specific Gravity 1.0

V. Shipping Containers
Bulk 5,000 tanker Container Spec.

Non-Bulk Size	Materials of Const.	Container Specification	Approx. Weight per Container	Container Label Used

VI. Properties

Flash Point >200 °F (closed cup) Btu/lb Corrosive No OSHA Carcinogen No
Color Clear to black pH 6-11 Radioactive No
Odor Sulfide Pyrophoric No Etiological No
Reactive No Explosive No
Toxic No Shock Sensitive No
Other

VII. D.O.T. Shipping Description Non-hazardous; non-regulated
D.O.T. Hazard Classification EPA Haz. Subst. RQ
D.O.T. Placard D.O.T. Label U.N. No. N.A. No.
Emergency Response Guide No.

VIII. Volume Annual 400,000-800,000 Volume This Request Volume Per Shipment

IX. Remarks (Treatment of Spills/Safety Suggestions/MSDS)

*Organically bound **As defined in 40 CFR 261.31
***Per 40 CFR 261.1 and 40 CFR 268 App III

Prepared by

VIII. Volume Annual 400,000-800,000 Volume This Request Volume Per Shipment

IX. Remarks (Treatment of Spills/Safety Suggestions/MSDS)

*Organically bound **As defined in 40 CFR 261.31
***Per 40 CFR 261.1 and 40 CFR 268 App III

Prepared by

APPENDIX G

LYNDONVILLE SITE SOIL AND LEACHATE DATA

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. SW 2918013
Collected: 4/27/98 at 16:30 by PM

Submitted: 4/28/98 Reported: 5/ 5/98
Discard: 6/ 5/98

LYN-Junction-Box Composite Soil Sample

Lyndonville, NY

Account No: 07032
CRG-E.I.DuPont de Nemours & Co
P.O. Box 47
Old Hickory TN 37138-0047

P.O. LBIO-62248
Rel. LE67

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
1123	Cyanide (Reactivity)	< 100.	100.	mg/kg
1121	Reactivity	See Below		See Below

Reactivity:
The sample was extracted by the interim method described in SW 846, Chapter 7.3. This solution was analyzed for cyanide and sulfide. This waste is not considered reactive and hazardous because it does not generate a quantity of hydrogen cyanide exceeding 250 mg/kg or hydrogen sulfide exceeding 500 mg/kg. These interim threshold limits were established by the Solid Waste Branch of EPA, July, 1992. These results do not reflect total cyanide or total sulfide.

1122	Sulfide (Reactivity)	< 50.	50.	mg/kg

1 COPY TO Woodward Clyde Diamonds ATTN: Ms. Sara Seastrom

Questions? Contact your Client Services Representative
Nancy Bornhole at (717) 656-2300
07:13:01 D 0001 3 130950 612518
320 8.00 00011060 ASR000

Respectfully Submitted
Ramona V. Layman
Manager, Metals/Data Deliv.

MEMBER

Analysis Report

LABORATORY CHRONICLE

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. SW 2918013
Collected: 04/27/98 at 16:30 by PH

Submitted: 04/28/98

LTB-Junction-Box Composite Soil Sample

Lyndonville, NY
JUNC SOIL

Account No: 07032
CRG-E.I.DuPont de Nemours & Co
P.O. Box 47
Old Hickory TN 37138-0047

CAT NO	ANALYSIS NAME	METHOD	TRIAL	ANALYSIS ID	DATE AND TIME	ANALYST
1123	Cyanide (Reactivity)	SW-846 9012	1		04/30/98 1950	Arin E. Grim
1121	Reactivity	SW-846 Chapter 7.3.4	1		04/30/98 1010	Susan E. Hibner
1122	Sulfide (Reactivity)	SW-846 9030A	1		04/30/98 1810	Susan E. Hibner

Analysis Report

QUALITY CONTROL REPORT

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. 2918013

LYN-Junction Box Composite Soil Sample

Lyndonville, NY

Group No. 612518
CSD-E.I.DuPont de Nemours & Co

	SAMPLE LOQ	SAMPLE UNITS	BLANK	DUP RPD	MS	MSD	MS RPD	LCS	LCS DUP	LCS RPD	LCS LOW	LCS LIMITS HIGH
1123 Cyanide (Reactivity)	100.	mg/kg	Batch: 981208104101 < 100. mg/kg	0 (1)				107	107	0	80	120
1121 Reactivity	see below		Batch: 981208141112100A									
1122 Sulfide (Reactivity)	50.	mg/kg	Batch: 981208141112100A < 50. mg/kg	0 (1)				221	167	12	83	122

(1) The result for one or both determinations was less than five times the LOQ.

Analysis Report

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. TL 2918014
Collected: 4/27/98 at 10:30 by PN

Submitted: 4/28/98 Reported: 5/ 5/98
Onward: 5/ 5/98

LYN-Junction Box Composite Soil Sample
TCLP NON-VOLATILE EXTRACTION
Lynnville, NY

Account No: 07032
CRG-E.I.DuPont de Nemours & Co
P.O. Box 47
Old Hickory TN 37138-0047

P.O. LB10-02948
Rel. LE67

CAT NO	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
1336	Selenium	< 0.20	0.20	mg/l
1746	Barium	0.55	0.10	mg/l
1749	Cadmium	< 0.020	0.010	mg/l
1751	Chromium	< 0.030	0.030	mg/l
1756	Lead	< 0.10	0.10	mg/l
1764	Silver	< 0.020	0.020	mg/l
	The matrix spike & matrix spike duplicate percent recoveries were out of specification for silver. The recovery of the post digest spike performed on the background sample was 57.5%.			
0359	Mercury	< 0.00020	0.00020	mg/l
	The metal analyses were performed on a non-volatile leachate prepared according to the procedure specified in the June 29, 1990 Federal Register. A sample is considered to have failed the Toxicity Characteristic (TC) test and is considered a Hazardous waste if any of the metal concentrations (mg/l) in the leachate exceed the following exmtas (100 times the Primary Drinking Water Standards):			

Arsenic	5.0	Cadmium	1.0	Lead	5.0	Selenium	1.0
Barium	100.0	Chromium	5.0	Mercury	0.2	Silver	5.0

The limits are published in March 29, 1990 Federal Register, pp. 11845-6.

1045	Arsenic	0.031	0.010	mg/l
0360	TCLP Pesticides			See Page 2
0952	TCLP Herbicides			See Page 3
0949	TCLP Acid Base/Neutrals			See Page 4

1 COPY TO Woodward Clyde Diamonds ATTN: Ms. Sara Seastrom

Questions? Contact your Client Services Representative
Nancy Bormuda at (717) 656-2300
07:13:17 D 0001 3 130960 612518
300 0.00 00190140 ASR000

Respectfully Submitted
Ramona V. Layman
Manager, Metals/Data Deliv.

ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. TL 2918014
Collected: 4/27/98 at 16:30 By PM

Submitted: 4/28/98 Reported: 5/ 5/98
Discard: 6/ 5/98

LTN-Junction-Box Composite Soil Sample
TCLP NON-VOLATILE EXTRACTION
Lyndonville, NY

Account No: 87032
CRG-E.I.DuPont de Nemours & Co
P.O. Box 67
Old Hickory TN 37138-0067

P.O. LB30-62240
Rel. LE67

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
TCLP Pesticides				
1977	Chlordane	< 0.0025	0.0025	mg/l
1976	Endrin	< 0.00010	0.00010	mg/l
1973	Heptachlor	< 0.000050	0.000050	mg/l
1974	Heptachlor Epoxide	< 0.000050	0.000050	mg/l
1972	Gamma BHC - Lindane	< 0.000050	0.000050	mg/l
1975	Methoxychlor	< 0.00050	0.00050	mg/l
1978	Toxaphene	< 0.0050	0.0050	mg/l

The pesticide/herbicide analyses were performed on a non-volatile toxicity characteristic leachate of the submitted waste. The leachate was prepared according to the procedure specified in the March 29 and the June 29, 1990 Federal Registers.
A sample is considered to have failed the Toxicity Characteristic (TC) test and is therefore considered a hazardous waste if any of the contaminant concentrations (mg/l) in the leachate exceed the following maximum:

Chlordane	0.03	Methoxychlor	10.0
Endrin	0.02	Toxaphene	0.5
Heptachlor (and epoxide)	0.008	2,4-D	10.0
Lindane	0.4	2,4,5-TP(Silvex)	1.0

The limits are published in March 29, 1990 Federal Register, pp. 11845-5.
The percent recovery for gamma-BHC was outside the QC limits in the MS associated with this sample. The percent recovery for methoxychlor was outside the QC limits in the MS/MSD associated with this sample. These compounds met the recovery criteria in the LCS/LCSD analysis.

Questions? Contact your Client Services Representative
Nancy Bornheim at (717) 656-2300

Respectfully Submitted
Jenifer E. Hess, B.S.
Group Leader Pesticides/PCBs

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. TL 2918014
Collected: 4/27/98 at 16:30 by PM

Submitted: 4/28/98 Reported: 5/ 5/98
Discard: 6/ 8/98

LYN-Junction-Box Composite Soil Sample
TCLP NON-VOLATILE EXTRACTION
Lyndonville, NY

Account No: 07032
CRG-E.I.DuPont de Nemours & Co
P.O. Box 47
Old Hickory TN 37138-0047

P.O. LB10-60240
Rel. LE67

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
TCLP Herbicides				
1979	2,4-D	< 0.016	0.010	mg/l
1980	2,4,5-TP	< 0.0010	0.0010	mg/l

Questions? Contact your Client Services Representative
Nancy Bornholm at (717) 656-2300

Respectfully Submitted
Jennifer E. Hess, B.S.
Group Leader Pesticides/PCBs

MEMBER ACIL

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. TL 2918014
Collected: 4/27/98 at 10:30 by PH

Submitted: 4/28/98 Reported: 5/ 5/98
Discard: 6/ 5/98

LYN-Junction-Box Composite Soil Sample
TCLP NON-VOLATILE EXTRACTION
Lyndonville, NY

Account No: 07612
CRG-E.I.DuPont de Nemours & Co
P.O. Box 47
Old Hickory TN 37138-0047

P.O. LB10-62248
Rel. LE67

CAT NO	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
TCLP Acid Base/Neutrals				
3324	pyridine	< 0.030	0.030	mg/l
3325	1,4-dichlorobenzene	< 0.030	0.030	mg/l
3326	2-methylphenol	< 0.030	0.030	mg/l
3327	3- and 4-methylphenol	< 0.030	0.030	mg/l
3328	hexachloroethane	< 0.030	0.030	mg/l
3329	nitrobenzene	< 0.030	0.030	mg/l
3330	hexachlorobutadiene	< 0.030	0.030	mg/l
3331	2,4,6-trichlorophenol	< 0.030	0.030	mg/l
3332	2,4,5-trichlorophenol	< 0.030	0.030	mg/l
3333	2,4-dinitrotoluene	< 0.030	0.030	mg/l
3334	hexachlorobenzene	< 0.030	0.030	mg/l
3335	pentachlorophenol	< 0.076	0.076	mg/l

The semivolatile analyses were performed on a non-volatile toxicity characteristic leachate of the submitted waste. The leachate was prepared according to the procedure specified in the March 29 and the June 29, 1990 Federal Registers.
A sample is considered to have failed the Toxicity Characteristic (TC) test and is therefore considered a hazardous waste if any of the semivolatile concentrations (mg/l) in the leachate exceed the following maxima:

Total Methylphenols	200.0	Nitrobenzene	2.0
1,4-Dichlorobenzene	7.5	Pentachlorophenol	100.0
2,4-Dinitrotoluene	0.13	Pyridine	5.0
Hexachlorobenzene	0.13	2,4,5-Trichlorophenol	400.0
Hexachlorobutadiene	0.5	2,4,6-Trichlorophenol	2.0
Hexachloroethane	3.0		

The limits are published in March 29, 1990 Federal Register, pp. 11846-8.
Due to insufficient sample, the quantitation limits for the GC/MS semivolatile compounds were raised.

The percent recovery for 2,4,5-Trichlorophenol was outside QC limits in the LCS associated with this sample. This compound met recovery criteria in the MS/MSD analysis.

Questions? Contact your Client Services Representative
Nancy Barnhoin at (717) 656-2300

Respectfully Submitted
Charles J. Neslund, B.S.
Group Leader, GC/MS SVOA

LABORATORY CHRONICLE

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. TL 2918014
Collected: 04/27/98 at 15:30 by PM

Submitted: 04/28/98

LYN-Junction-Box Composite Soil Sample
TCLP NON-VOLATILE EXTRACTION
Lyndonville, NY
JUNKY SOIL

Account No: 07632
CRG-E I.DuPont de Nemours & Co
P.O. Box 47
Old Hickory TN 37138-0047

CAT NO	ANALYSIS NAME	METHOD	TRIAL	ANALYSIS ID	DATE AND TIME	ANALYST
1336	Selenium	SW-846 6010A	1		04/29/98 2139	Julie A. Slaughenhoupt
1746	Barium	SW-846 6010A	1		04/29/98 2139	Julie A. Slaughenhoupt
1749	Cadmium	SW-846 6010A	1		04/29/98 2139	Julie A. Slaughenhoupt
1751	Chromium	SW-846 6010A	1		04/29/98 2139	Julie A. Slaughenhoupt
1756	Lead	SW-846 6010A	1		04/29/98 2139	Julie A. Slaughenhoupt
1764	Silver	SW-846 6010A	1		04/29/98 2139	Julie A. Slaughenhoupt
5705	MA/TL SW 846 ICP Digest (toc)	SW-846 3010A	1		04/29/98 1330	Christine M. Conlin
0259	Mercury	SW-846 7470A	1		04/30/98 1428	Rosalind D. Ernest
1845	Arsenic	SW-846 7060A	1		04/29/98 2305	Jolene M. Schields
8713	MA SW846 Hg Digest	SW-846 7470A	1		04/29/98 2105	Nelli S. Markaryan
6264	MA/TL As/Se-GFAA Digest	SW-846 7060A	1		04/29/98 1330	Christine M. Conlin
0816	Water Sample Herbicide Extract	SW-846 8151	1		04/29/98 2240	Sherry Lynn Devlin
0817	Water Sample Pest. Extraction	SW-846 3510B	1		04/29/98 2330	Sherry Lynn Devlin
0950	TCLP Pesticides	SW-846 8081	1		04/30/98 2246	Artie D. Kanaalwen
0952	TCLP Herbicides	SW-846 8151	1		04/30/98 1108	James L. Bressler
0949	TCLP Acid Base/Neutrals	SW-846 8270B	1		04/30/98 1945	Eileen Hostetler
4731	TCLP Leachate Extraction	SW-846 7010A	1		04/29/98 2330	Sherry Lynn Devlin
0947	TCLP Non-volatile Extraction	SW-846 1311	1		04/28/98 1530	Drew K. Hitps

QUALITY CONTROL REPORT

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. 2918014

LYH-Junction Box Composite Soil Sample
TCLP NON-VOLATILE EXTRACTION
Lyndonville, NY

Group No. 612518
CRG-E.I.DuPont de Nemours & Co

	SAMPLE LOQ	SAMPLE UNITS	BLANK	DUP RPD	MS	MSD	MS RPD	LCS	LCS DUP	LCS RPD	LCS LOW	LCS LIMITS HIGH
1336 Selenium			Batch: 981195705003									
	0.20	mg/l	< 0.20 mg/l	0 (1)	88	89	1	100	107	1	80	120
1746 Barium			Batch: 981195705003									
	0.10	mg/l	< 0.10 mg/l	3	84	85	1	101	101	1	80	120
1749 Cadmium			Batch: 981195705003									
	0.010	mg/l	< 0.010 mg/l	0 (1)	81	81	0	99	99	0	80	120
1751 Chromium			Batch: 981195705003									
	0.030	mg/l	< 0.030 mg/l	0 (1)	81	82	1	101	100	1	80	120
1755 Lead			Batch: 981195705003									
	0.10	mg/l	< 0.10 mg/l	0 (1)	83	84	1	101	101	1	80	120
1766 Silver			Batch: 981195705003									
	0.020	mg/l	< 0.020 mg/l	0 (1)	72	62	15	103	102	1	80	120
8259 Mercury			Batch: 981195713003									
	0.00020	mg/l	< 0.00020 mg/l	0 (1)	90	87	4	91	91	0	80	120
1045 Arsenic			Batch: 981196254003									
	0.010	mg/l	< 0.010 mg/l	0 (1)	97	99	3	106	110	4	80	120
0850 TCLP Pesticides			Batch: 981190606A									
1977 Chlordane												
	0.0025	mg/l	< 2.5 ug/l									
1976 Endrin												
	0.00010	mg/l	< 0.10 ug/l		113	140	22	111	123	10	40	140
1973 Heptachlor												
	0.000050	mg/l	< 0.050 ug/l		86	93	8	79	87	10	46	120
1974 Heptachlor Epoxide												
	0.000060	mg/l	< 0.060 ug/l		96	109	13	95	105	10	64	126
1972 Gamma BHC - Lindane												
	0.000050	mg/l	< 0.050 ug/l		112	132	16	107	122	13	62	132
1975 Methoxychlor												
	0.00050	mg/l	< 0.50 ug/l		160	188	16	138	157	14	60	164
1978 Toxaphene												
	0.0050	mg/l	< 5.0 ug/l									
0952 TCLP Herbicides			Batch: 981190606A									
1979 2,4-D												
	0.010	mg/l	< 10. ug/l		100	102	6	82	100		52	141
1980 2,4,5-TP												
	0.0010	mg/l	< 1.0 ug/l		98	95	2	91	101		51	126
0949 TCLP Acid Base/Neutrals			Batch: 981196C026									
1324 pyridine												
	0.030	mg/l	< 0.030 mg/l		51	50	3	53	44	18	34	92
1325 1,4-dichlorobenzene												
	0.030	mg/l	< 0.030 mg/l		91	86	6	84	71	17	46	94
1326 2-methylphenol												
	0.030	mg/l	< 0.030 mg/l		84	79	5	89	78	16	58	96

(1) The result for one or both determinations was less than five times the LOD.

Lancaster Laboratories
A division of Thermo Analytical Inc.

QUALITY CONTROL REPORT

LLI Sample No. 2918014

LYN-Junction-Box Composite Soil Sample
TCLP NON-VOLATILE EXTRACTION
Lyndonville, NY

Group No. 612516
CNA-E.I.DuPont de Nemours & Co

	SAMPLE LOQ	SAMPLE UNITS	BLANK		DUP RPD	MS	MSD	MS RPD	LCS	LCS DUP	LCS RPD	LCS LIMITS LOW	LCS LIMITS HIGH
3327	3- and 4-methylphenol 0.010	mg/l	< 0.010	mg/l		73	68	7	82	71	13	48	99
3328	hexachloroethane 0.010	mg/l	< 0.010	mg/l		83	80	3	80	63	23	40	84
3329	nitrobenzene 0.010	mg/l	< 0.010	mg/l		109	103	6	125	87	19	61	113
3330	hexachlorobutadiene 0.010	mg/l	< 0.010	mg/l		80	78	2	77	62	21	24	86
3331	2,4,6-trichlorophenol 0.010	mg/l	< 0.010	mg/l		95	93	3	103	88	16	86	105
3332	2,4,5-trichlorophenol 0.010	mg/l	< 0.010	mg/l		97	94	4	105	91	14	67	103
3333	2,4-dinitrotoluene 0.010	mg/l	< 0.010	mg/l		103	101	2	103	89	15	64	112
3334	hexachlorobenzene 0.010	mg/l	< 0.010	mg/l		98	95	3	97	82	17	62	109
3335	pentachlorophenol 0.076	mg/l	< 0.025	mg/l		59	60	3	79	67	17	48	124

QUALITY CONTROL REPORT

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. 2918014

LYN-Junction Box Composite Soil Sample
TCLP NON-VOLATILE EXTRACTION
Lyndonville, NY

Group No. 612516
CRG-E.I.DuPont de Nemours & Co

SURROGATE SUMMARY

TRIAL ID	SURROGATE	RECOVERY %	SURROGATE LIMITS LOW	HIGH
0949 TCLP Acid Base/Neutrals	Nitrobe-d5	85	47	114
	2-Fbiphnyl	84	51	106
	Terphenyl-d14	86	37	119
	Phenol-d6	37	7	24
	2-Fluphenol	64	25	88
	2,4,6-TBP	77	34	128
0960 TCLP Pesticides	TCX	100	60	120
	DCB	105	60	120
0962 TCLP Herbicides	DCAA	113	60	120

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. TL 2918015
Collected: 4/27/98 at 14:30 by PM

Submitted: 4/28/98 Reported: 5/ 8/98
Discard: 6/ 5/98

LYN-Junction-Box Composite Soil Sample
TCLP ZERO HEADSPACE EXTRACTION
Lynchwille, NY

Account No: 07032
CRG-E.I.DuPont de Nemours & Co
P.O. Box 47
Old Hickory TN 37138-0047

P.O. LB10-92266
Rel. 1547

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
0948	TCLP Volatiles			See Page 2

1 COPY TO Woodward Clyde Diamond ATTN Ms. Sara Seastrom

Questions? Contact your Client Services Representative
Nancy Bernhelm at (717) 656-2300
07:14:10 D 0001 3 130950 612518
320 0.00 00029640 ASR000

Respectfully Submitted
Ramona V. Layman
Manager, Metals/Data Deliv.

Analysis Report

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. TL 2918015
Collected: 4/27/98 at 16:30 by PH

Submitted: 4/28/98 Reported: 5/ 5/98
Discard: 6/ 5/98

LYN-Junction-Box Composite Soil Sample
TCLP ZERO HEADSPACE EXTRACTION
Lyndonville, NY

Account No: 07032
CRG-E.I.DuPont de Nemours & Co
P.O. Box 47
Old Hickory TN 37138-0047

P.O. LB10-62248
Rel. LE47

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
TCLP Volatiles				
3492	Vinyl Chloride	< 0.025	0.025	mg/l
3600	1,1-Dichloroethene	< 0.025	0.025	mg/l
3503	Chloroform	< 0.025	0.025	mg/l
3504	1,2-Dichloroethane	< 0.025	0.025	mg/l
0218	2-Butanone	< 0.050	0.050	mg/l
3508	Carbon Tetrachloride	< 0.025	0.025	mg/l
3511	Trichloroethene	< 0.025	0.025	mg/l
3515	Benzene	< 0.025	0.025	mg/l
3522	Tetrachloroethene	< 0.025	0.025	mg/l
3525	Chlorobenzene	< 0.025	0.025	mg/l

The volatile organic analyses were performed on a zero headspace toxicity characteristic leachate of the submitted waste. The leachate was prepared according to the procedure specified in the March 29 and the June 29, 1990 Federal Registers.
A sample is considered to have failed the Toxicity Characteristic (TC) test and is therefore considered a hazardous waste if any of the volatile concentrations (mg/l) in the leachate exceed the following maxima:

Benzene	0.5	1,1-Dichloroethene	0.7
Carbon Tetrachloride	0.5	Methyl Ethyl Ketone (2-Butanone)	200.0
Chlorobenzene	100.0	Tetrachloroethene	0.7
Chloroform	6.0	Trichloroethene	0.5
1,2-Dichloroethane	0.5	Vinyl Chloride	0.2

The limits are published in March 29, 1990 Federal Register, pp. 11845-6.

Questions? Contact your Client Services Representative
Nancy Bornhale at (717) 656-2300

Respectfully Submitted
Duane A. Luckenbill, B.S.
Group Leader, GC/MS Volatiles

LABORATORY CHRONICLE

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. TL 2918015
Collected 04/27/98 at 16:30 by PM

Submitted: 04/28/98

LYN-Junction-Box Composite Soil Sample
TCLP ZERO HEADSPACE EXTRACTION
Lyndonville, NY
JUNCT SOUR:

Account No: 07032
CRG-E.I.DuPont de Nemours & Co
P.O. Box 47
Old Hickory TN 37138-0047

CAT NO	ANALYSIS NAME	METHOD	TRIAL	ANALYSIS ID	DATE AND TIME	ANALYST
0948	TCLP Volatiles	SW-846 8240B	1		04/29/98 1230	Ryan V. Holt
0946	TCLP Zero Headspace Extraction	SW-846 1311	1		04/28/98 1530	Drew K. Hikes

QUALITY CONTROL REPORT

Lancaster Laboratories
A division of Thermo Analytical Inc.

LLI Sample No. 2918015

LYN-Junction-Box Composite Soil Sample
TCLP ZERO HEADSPACE EXTRACTION
Lyndonville, NY

Group No. 612518
CAS-E.I.DuPont de Nemours & Co

SAMPLE LOQ	SAMPLE UNITS	BLANK		DUP RPD	MS	MSD	MS RPD	LCS	LCS DUP	LCS RPD	LCS LIMITS LOW	LCS LIMITS HIGH
0948 TCLP Volatiles		Batch: 0981191A8										
3482 Vinyl Chloride												
0.025	mg/l	< 5.	ug/l		111	111	0					
3500 1,1-Dichloroethane												
0.025	mg/l	< 5.	ug/l		120	117	3					
3543 Chloroform												
0.025	mg/l	< 5.	ug/l		103	104	1					
3584 1,2-Dichloroethane												
0.025	mg/l	< 5	ug/l		107	105	1					
0316 2-Butanone												
0.050	mg/l	< 10.	ug/l		129	115	11					
3596 Carbon Tetrachloride												
0.025	mg/l	< 5.	ug/l		99	102	3					
3511 Trichloroethene												
0.025	mg/l	< 5.	ug/l		97	103	6					
3516 Benzene												
0.025	mg/l	< 5.	ug/l		103	106	2					
3622 Tetrachloroethene												
0.025	mg/l	< 5.	ug/l		86	87	1					
3625 Chlorobenzene												
0.025	mg/l	< 5.	ug/l		93	91	2					

RECRA LABNET, a division of Recra Environmental, Inc.

CHAIN OF CUSTODY RECORD

PROJECT NO: 7071

SITE NAME: LYNDONVILLE NY

SAMPLERS (SIGNATURE): Paul J Mazierski

STATION NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NO OF CONTAINERS	40Z GLASS	1L GLASS	REMARKS
	4/27/18	16[illegible]	✓		JUNCTION BOX-TCLP	3	1	2	FULL TCLP (INCLUDING PEST/HERB, CN AND SULFIDE REACTIVITY
									* 48 HOUR TURNAROUND
									FAX PRELIMINARY RESULTS TO MIKE AUCOIN - WOODWARD-CLYDE
									DIAMOND GROUP AND PAUL MAZIERSKI OF DUPONT (716 278-5238)
									ARSENIC RESULTS NEEDED ASAP !!!

RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE/TIME	RECEIVED BY (SIGNATURE)
Paul J Mazierski	4/27/18 [illegible]	FEDEX			
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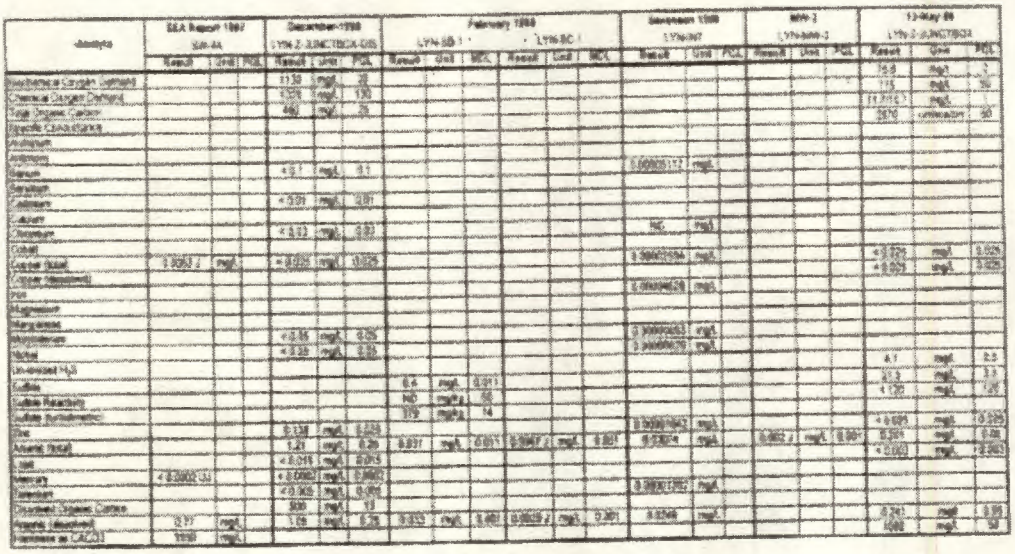
Distribution: Original accompanies shipment; copy to coordinator field files



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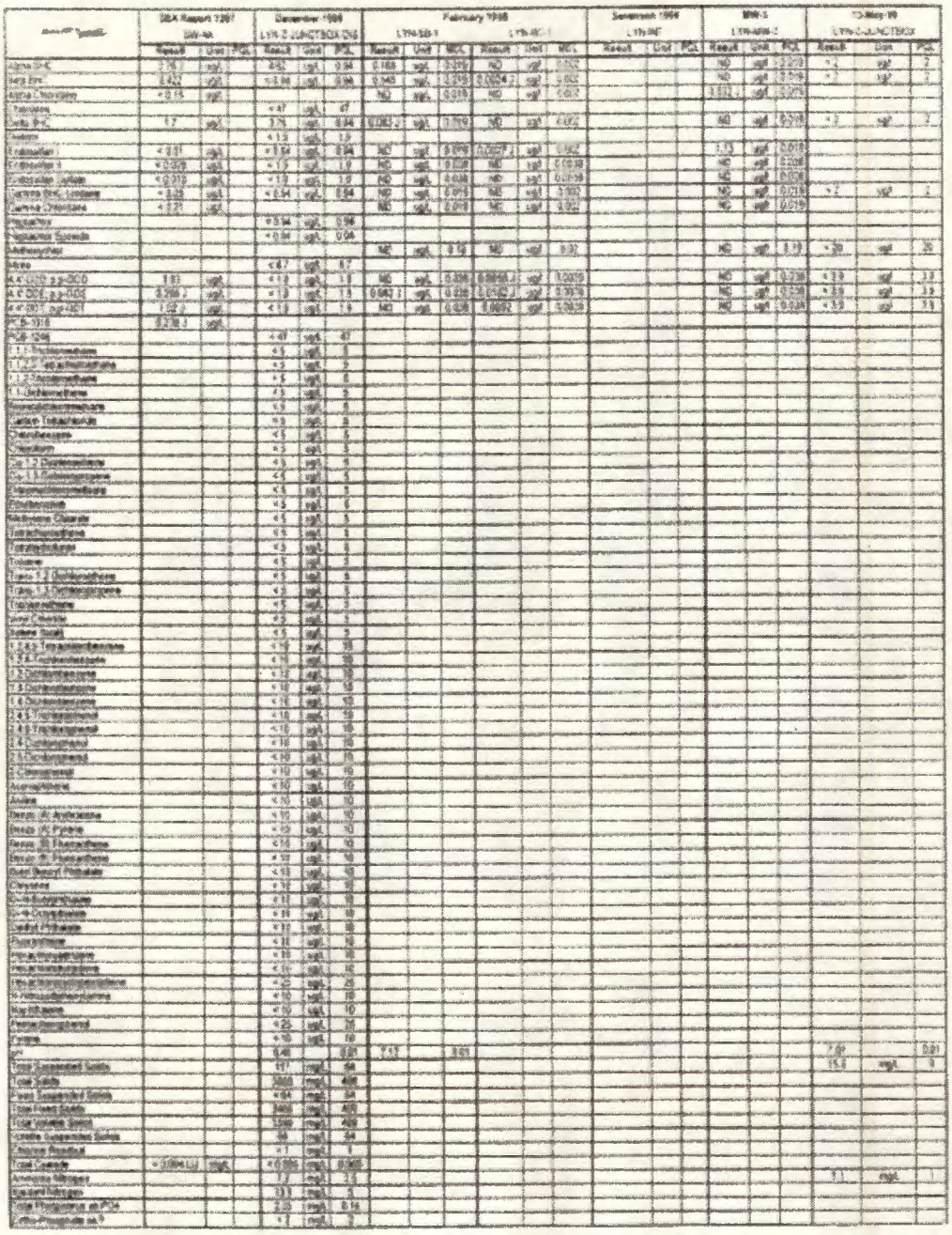


Groundwater Results
Lyndonville-West Avenue Site Supplemental Environmental Assessment

Sample Name:		B/P-EWEST-WE	MW-1	MW-2	MW-3	MW-4	MW-5	MW-5
Sample Date:		05AUG97	05AUG97	05AUG97	05AUG97	11NOV97	05AUG97	05AUG97 DUP
Analyte	Units							
Volatiles								
1,1,1-Trichloroethane	ug/l	U	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	ug/l	U	U	U	U	U	U	U
1,1,2-Trichloroethane	ug/l	U	U	U	U	U	U	U
1,1-Dichloroethane	ug/l	U	U	U	U	U	U	U
1,1-Dichloroethene	ug/l	U	U	U	U	U	U	U
1,2-Dichloroethane	ug/l	U	U	U	U	U	U	U
1,2-Dichloropropane	ug/l	U	U	U	U	U	U	U
2-Hexanone	ug/l	U	U	U	U	U	U	U
Acetone	ug/l	U	U	U	U	U	U	U
Benzene	ug/l	U	U	U	U	U	U	U
Bromodichloromethane	ug/l	U	U	U	U	U	U	U
Bromoform	ug/l	U	U	U	U	U	U	U
Carbon Disulfide	ug/l	U	U	U	U	U	U	U
Carbon Tetrachloride	ug/l	U	U	U	U	U	U	U
Chlorobenzene	ug/l	U	U	U	U	U	U	U
Chloroethane	ug/l	U	U	U	U	U	U	U
Chloroform	ug/l	U	U	U	U	U	U	U
Cis-1,2-Dichloroethene	ug/l	U	U	U	U	U	U	U
Cis-1,3-Dichloropropene	ug/l	U	U	U	U	U	U	U
Dibromochloromethane	ug/l	U	U	U	U	U	U	U
Ethylbenzene	ug/l	U	U	U	U	U	U	U
Methyl Bromide	ug/l	U	U	U	U	U	U	U
Methyl Chloride	ug/l	U	U	U	U	U	U	U
Methyl Ethyl Ketone	ug/l	U	U	U	U	U	U	U
Methyl-Iso-Butyl Ketone	ug/l	U	U	U	U	U	U	U
Methylene Chloride	ug/l	U	U	U	U	U	U	U
Styrene	ug/l	U	U	U	U	U	U	U
Tetrachloroethene	ug/l	U	U	U	U	U	U	U
Toluene	ug/l	U	U	U	U	U	U	U
Trans-1,2-Dichloroethene	ug/l	U	U	U	U	U	U	U
Trans-1,3-Dichloropropene	ug/l	U	U	U	U	U	U	U
Trichloroethene	ug/l	U	U	U	U	U	U	U
Vinyl Acetate	ug/l	U	U	U	U	U	U	U
Vinyl Chloride	ug/l	U	U	U	U	U	U	U
Xylenes (Total)	ug/l	U	U	U	U	U	U	U

Groundwater Results
Lyndonville-West Avenue Site Supplemental Environmental Assessment

Sample Name:		B/T-ENERGY-WE	MW-1	MW-2	MW-3	MW-4	MW-5	MW-5
Sample Date:		05AUG97	05AUG97	05AUG97	05AUG97	11NOV97	05AUG97	05AUG97 DUP
Analyte	Unit							
Semi-Volatiles								
1,2,4-Trichlorobenzene	ug/l	U	10 U	U	U	10 U	U	10 U
1,2-Dichlorobenzene	ug/l	U	10 U	U	U	10 U	U	10 U
1,3-Dichlorobenzene	ug/l	U	10 U	U	U	10 U	U	10 U
1,4-Dichlorobenzene	ug/l	U	10 U	U	U	10 U	U	10 U
2,4,5-Trichlorophenol	ug/l	U	10 U	U	U	10 U	U	10 U
2,4,6-Trichlorophenol	ug/l	U	10 U	U	U	10 U	U	10 U
2,4-Dichlorophenol	ug/l	U	10 U	U	U	10 U	U	10 U
2,4-Dimethylphenol	ug/l	U	10 U	U	U	10 U	U	10 U
2,4-Dinitrophenol	ug/l	U	10 U	U	U	10 U	U	10 U
2,4-Dinitrotoluene	ug/l	U	10 U	U	U	10 U	U	10 U
2,6-Dinitrotoluene	ug/l	U	10 U	U	U	10 U	U	10 U
2-Chloronaphthalene	ug/l	U	10 U	U	U	10 U	U	10 U
2-Chlorophenol	ug/l	U	10 U	U	U	10 U	U	10 U
2-Methylnaphthalene	ug/l	U	10 U	U	U	10 U	U	10 U
2-Nitrophenol	ug/l	U	10 U	U	U	10 U	U	10 U
3 or 4-Methylphenol	ug/l	U	10 U	U	U	10 U	U	10 U
3,3'-Dichlorobenzidine	ug/l	U	10 U	U	U	10 U	U	10 U
4,6-Dinitro-2-Methylphenol	ug/l	U	10 U	U	U	10 U	U	10 U
4-Bromophenyl Phenyl Ether	ug/l	U	10 U	U	U	10 U	U	10 U
4-Chloro-3-Methylphenol	ug/l	U	10 U	U	U	10 U	U	10 U
4-Chlorophenyl Phenyl Ether	ug/l	U	10 U	U	U	10 U	U	10 U
4-Nitrophenol	ug/l	U	10 U	U	U	10 U	U	10 U
Acenaphthene	ug/l	U	10 U	U	U	10 U	U	10 U
Acenaphthylene	ug/l	U	10 U	U	U	10 U	U	10 U
Anthracene	ug/l	U	10 U	U	U	10 U	U	10 U
Benzo(a)anthracene	ug/l	U	10 U	U	U	10 U	U	10 U
Benzo(a)pyrene	ug/l	U	10 U	U	U	10 U	U	10 U
Benzo(b)fluoranthene	ug/l	U	10 U	U	U	10 U	U	10 U
Benzo(ghi)perylene	ug/l	U	10 U	U	U	10 U	U	10 U
Benzo(k)fluoranthene	ug/l	U	10 U	U	U	10 U	U	10 U
Bis(2-Chloroethoxy)Methane	ug/l	U	10 U	U	U	10 U	U	10 U
Bis(2-Chloroethyl) Ether	ug/l	U	10 U	U	U	10 U	U	10 U
Bis(2-Chloroisopropyl)Ether	ug/l	U	10 U	U	U	10 U	U	10 U
Bis(2-Ethylhexyl)Phthalate	ug/l	U	10 U	U	U	10 U	U	10 U
Butyl Benzyl Phthalate	ug/l	U	10 U	U	U	10 U	U	10 U
Carbazole	ug/l	U	10 U	U	U	10 U	U	10 U
Chrysene	ug/l	U	10 U	U	U	10 U	U	10 U
Di-N-Butyl Phthalate	ug/l	U	10 U	U	U	10 U	U	10 U
Di-N-Octyl Phthalate	ug/l	U	10 U	U	U	10 U	U	10 U
Dibenzo(a,h)anthracene	ug/l	U	10 U	U	U	10 U	U	10 U
Dibenzofuran	ug/l	U	10 U	U	U	10 U	U	10 U
Diethyl Phthalate	ug/l	U	10 U	U	U	10 U	U	10 U
Dimethyl Phthalate	ug/l	U	10 U	U	U	10 U	U	10 U
Fluoranthene	ug/l	U	10 U	U	U	10 U	U	10 U
Fluorene	ug/l	U	10 U	U	U	10 U	U	10 U
Hexachlorobenzene	ug/l	U	10 U	U	U	10 U	U	10 U
Hexachlorobutadiene	ug/l	U	10 U	U	U	10 U	U	10 U
Hexachlorocyclopentadiene	ug/l	U	10 U	U	U	10 U	U	10 U

Groundwater Results
Lyndonville-West Avenue Site Supplemental Environmental Assessment

Sample Name:		B/F-EXEBST-WE	MW-1	MW-2	MW-3	MW-4	MW-5	MW-5
Sample Date:		05AUG97	05AUG97	05AUG97	05AUG97	11NOV97	05AUG97	05AUG97 DUP
Analyte (Continued from previous page)	Units							
Hexachloroethane	ug/L	NR	<1	NR	NR	<1	<1	<1
Indeno(1,2,3-C,D)Pyrene	ug/L	NR	<1	NR	NR	<1	<1	<1
Isophorone	ug/L	NR	<1	NR	NR	<1	<1	<1
N-Nitrosodi-n-Propylamine	ug/L	NR	<2	NR	NR	<2 UJ	<2	<2
N-Nitrosodiphenylamine	ug/L	NR	<1 UJ	NR	NR	<1	<1 UJ	<1 UJ
Naphthalene	ug/L	NR	<1	NR	NR	<1	<1	<1
Nitrobenzene	ug/L	NR	<1	NR	NR	<1	<1	<1
O-Cresol	ug/L	NR	<1	NR	NR	<1	<1	<1
O-Nitroaniline	ug/L	NR	<2 UJ	NR	NR	<2	<1	<1
P-Chloroaniline	ug/L	NR	<1	NR	NR	<1	<2 UJ	<2 UJ
P-Nitroaniline	ug/L	NR	<2	NR	NR	<2	<2	<2
Pentachlorophenol	ug/L	NR	<1	NR	NR	<1	<1	<1
Phenanthrene	ug/L	NR	<2	NR	NR	<2	<1	<1
Phenol	ug/L	NR	<1	NR	NR	<1	<1	<1
Pyrene	ug/L	NR	<1	NR	NR	<1	<1	<1

Groundwater Results
Lyndonville-West Avenue Site Supplemental Environmental Assessment

Sample Name:		B/F-ENERGY-WE	MW-1	MW-2	MW-3	MW-4	MW-5	MW-5
Sample Date:		05AUG97	05AUG97	05AUG97	05AUG97	11AUG97	05AUG97	05AUG97
								DUP
Analyte	Units							
Pesticides								
4,4'-DDD	µg/L	<0.0048	<0.0048	<0.0048	<0.0048	0.026	<0.02	<0.02
4,4'-DDE	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
4,4'-DDT	µg/L	<0.009	<0.009	<0.009	<0.009	<0.009	<0.018	<0.018
Aldrin	µg/L	NR	<0.0063	NR	NR	<0.02	<0.0063	<0.0063
Alpha-BHC	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Alpha Chlordane	µg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Beta-BHC	µg/L	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011
Delta-BHC	µg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Dieldrin	µg/L	NR	<0.001	NR	NR	<0.02	<0.01	<0.01
Endosulfan I	µg/L	0.0054 U	0.0037 U	<0.002	0.0075 U	0.0072 J	<0.002	<0.002
Endosulfan II	µg/L	<0.0049	<0.0049	0.061 J	0.006	0.062 J	0.975 J	0.883
Endosulfan Sulfate	µg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.006	<0.006
Endrin	µg/L	NR	<0.0071	NR	NR	0.063	<0.0071	<0.0071
Endrin Aldehyde	µg/L	NR	<0.0048	NR	NR	<0.0048	<0.0048	<0.0048
Endrin Ketone	µg/L	NR	<0.0041	NR	NR	<0.0041	<0.0041	<0.0041
Gamma-BHC	µg/L	<0.001	<0.001	<0.001	<0.001	0.0061 J	<0.001	<0.001
Gamma Chlordane	µg/L	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Heptachlor	µg/L	NR	<0.0016	NR	NR	<0.0016	<0.0016	<0.0016
Heptachlor Epoxide	µg/L	NR	<0.001	NR	NR	<0.04	<0.02	<0.02
Methoxychlor	µg/L	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
PCB-1016	µg/L	NR	<0.043	NR	NR	<0.043	<0.043	<0.043
PCB-1221	µg/L	NR	<0.12	NR	NR	<0.12	<0.12	<0.12
PCB-1232	µg/L	NR	<0.048	NR	NR	<0.048	<0.048	<0.048
PCB-1242	µg/L	NR	<0.1	NR	NR	<0.1	<0.1	<0.1
PCB-1248	µg/L	NR	<0.038	NR	NR	<0.038	<0.038	<0.038
PCB-1254	µg/L	NR	<0.14	NR	NR	<0.14	<0.14	<0.14
PCB-1260	µg/L	NR	<0.036	NR	NR	<0.036	<0.036	<0.036
Toxaphene	µg/L	NR	<0.4	NR	NR	<0.4	<0.4	<0.4

Groundwater Results
Lyndonville-West Avenue Site Supplemental Environmental Assessment

Sample Name:		E/F-ENERGY-WZ	MW-1	MW-2	MW-3	MW-4	MW-5	MW-5
Sample Date:		05AUG97	05AUG97	05AUG97	05AUG97	19NOV97	05AUG97	05AUG97 DUP
Analyte	Unit							
Metals								
Aluminum	mg/L	NR	2.05 J	NR	NR	1.06	2.7 J	2.42 J
Antimony	mg/L	NR	<0.019	NR	NR	<0.0017	<0.019	<0.019
Arsenic	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Barium	mg/L	NR	0.0826 J	NR	NR	0.0179 J	0.0545 J	0.0558 J
Beryllium	mg/L	NR	<0.0021	NR	NR	<0.0021	<0.0021	<0.0021
Cadmium	mg/L	NR	<0.0031	NR	NR	<0.0031	<0.0031	<0.0031
Calcium	mg/L	NR	147	NR	NR	475	127	135
Chromium	mg/L	NR	<0.0066	NR	NR	<0.0066	<0.0066	<0.0066
Cobalt	mg/L	NR	<0.0058	NR	NR	<0.0058	<0.0058	<0.0058
Copper	mg/L	0.0105 J	0.0123 J	0.0089 J	0.011 J	<0.0045	0.0104 J	0.0137 J
Iron	mg/L	NR	3.48 J	NR	NR	1.87	4.72 J	4.28 J
Lead	mg/L	NR	0.0028 J	NR	NR	<0.0011	0.0049 J	0.0036 J
Magnesium	mg/L	NR	47.7	NR	NR	200	49.3	42.9
Manganese	mg/L	NR	0.845	NR	NR	0.488	0.204	0.172
Mercury	mg/L	<0.000023	<0.000023	<0.000023	<0.000023	<0.000023 UJ	<0.00004	<0.000023
Nickel	mg/L	NR	0.0096 J	NR	NR	<0.0078	<0.0078	0.0083 J
Potassium	mg/L	NR	3.78	NR	NR	5.49	2.23	2.51
Selenium	mg/L	NR	<0.0012	NR	NR	<0.0012 UJ	<0.0012	<0.0012
Silver	mg/L	NR	<0.0047	NR	NR	<0.0047	<0.0047	<0.0047
Sodium	mg/L	NR	50.4	NR	NR	135	63.7	65.4
Thallium	mg/L	NR	<0.0012	NR	NR	<0.0012	<0.0012	<0.0012
Vanadium	mg/L	NR	<0.0056	NR	NR	<0.0056	<0.0056	<0.0056
Zinc	mg/L	NR	0.046	NR	NR	0.013 J	0.03 J	0.041 J
Miscellaneous Parameters								
Cyanide, total	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Sulfide as S	mg/L	<0.55	<0.55	<0.55	<0.55	<0.55	<0.55	<0.55

Groundwater Results
Lyndonville-West Avenue Site Supplemental Environmental Assessment

NOTES:

< Less than MDL
NR Analyte Not Requested
J The associated value is usable, but is considered an estimated quantity. The value is considered estimated in most cases because the detected value is above the MDL but below the practical quantitation limit (PQL). In some cases the value is considered estimated because QC criteria were not met during analysis.
UJ The analyte was analyzed for but not detected above the listed MDL. However, the listed MDL is considered to be an estimated value due to QC criteria not being met.
U The analyte is considered not detected due to the presence of the analyte at similar levels in associated laboratory and/or equipment blanks.

Data: Data were reviewed against analytical method requirements using US EPAs National Functional Guidelines as a guide. Any qualifiers supplied with the data by the lab have been replaced by validation qualifiers.
Report created on February 12, 1998

APPENDIX H

PROJECT SPECIFIC WASTE MANAGEMENT PROCEDURES FOR DUPONT LYNDONVILLE-WEST AVENUE SITE'S CONSTRUCTION ACTIVITIES

APPENDIX H
PROJECT SPECIFIC WASTE MANAGEMENT PROCEDURES FOR CONSTRUCTION ACTIVITIES

April 5, 2001

Project No. D1LY7236

DUPONT

CORPORATE REMEDIATION GROUP
An Alliance between
DuPont and URS Diamond

Barley Mill Plaza, Building 27
Wilmington, Delaware 19805

TABLE OF CONTENTS

Forms

Tables

1.1 DESCRIPTION OF ACTIVITIES AND WASTE STREAMS

DuPont will install and place into service a leachate collection system and a storage tank at the Lyndonville-West Avenue site. The following waste streams are anticipated to result from the installation of the leachate collection system and storage tank:

- Soil from the area of installation of the tank
- Personal Protection Equipment
- Decontamination water
- Construction debris

2.1 RCRA LISTING CODES

The applicability of RCRA listing codes is documented in Appendix E of this Waste Management Plan.

2.2 DETERMINATION OF RCRA CHARACTERIZATION CODES

The determination of whether the waste is characteristically hazardous is based on previous analytical results collected from the DuPont Lyndonville-West Ave site and generator knowledge.

A waste exhibits RCRA characteristics of toxicity and carries a characteristic code if, by using the TCLP method, the extract from a representative sample of the waste contains a specific contaminant at concentrations equal to or greater than its representative toxicity characteristic level.

Analytical results from soil samples analysis from Lyndonville-West Ave site and groundwater analysis for the DuPont Lyndonville-West Ave site (see Appendix G) indicate that the site can best be described by a non-hazardous and non-regulated classification. Therefore, RCRA characteristics will be determined based on these analytical results and generator knowledge. The material generated during the Lyndonville tank installation and construction is, therefore, anticipated to be non-hazardous.

2.3 WASTE MANAGEMENT PROCEDURES

A description of the waste streams that will be generated during construction activities and expected disposal methods are presented in the following sections:

- Soil from the installation of the leachate collection system and the storage tank:

  Soil will be generated as a result of the installation of a 6,500-gallon storage tank. It is estimated that 5- 20-yards of soil will be generated. The soil will be containerized in a roll-off box. This material is considered non-hazardous based on previous site knowledge and past analytical results and will be sent to CWM Chemical Services Model City Subtitle-C landfill in this container.

- Decontamination water — decontamination of site construction equipment:

  Approximately 110 gallons of waste decontamination water may be generated from the steam cleaning or washing of site construction equipment during decontamination activities. Only water from steam cleaning or tap water with alconox detergent will be used during decon. No other cleaning materials will be used during decontamination. The decon water will be stored in two 55-gallon open-head drums and labeled as non-hazardous decon water. The material will be pumped from the drums into the storage tank once it is operational or will be evacuated with the first load of leachate sent off site for treatment. The remaining solids will be placed in the roll-off box being sent to CWM Chemical Services Model City landfill.

- Personal Protection Equipment (PPE):

  PPE generated from the installation of the leachate collection system and temporary storage tank will be combined with the soil roll-off box destined for CWM Chemical Services Model City landfill. Approximately 20-50 pounds of PPE will be collected and containerized.

- Construction debris-plastic and steel piping, wood, stone, rebar, cement and garbage from activities associated with the tank's installation:

  Debris generated from the installation of the storage tank will be combined with the soil roll-off box destined for CWM Chemical Services Model City landfill. Approximately 1-3 tons of debris will be collected and containerized.

Table H-1

DuPont Lyndonville-West Ave Site

CONSTRUCTION PROJECT RESPONSIBILITIES

Task	Organization	Individual
Conduct waste coordinator duties (unless specified elsewhere).	URS Diamond Group (URSD)	Jason G. Sykes
Oversee waste management activities.	URSD	Jason G. Sykes
Coordinate sampling activities.	URSD	D. Sheldon
Select and oversee waste transportation And disposal contractors. Selection Oversight	 DuPont DuPont or Designate	Jason G. Sykes
Coordinate contract laboratory.	URSD	D. Sheldon
Review analytical data and submit data to site environmental coordinator for waste characterization determination.	DuPont or URSD	Jason G. Sykes
Mark containers.	URSD	Jason G. Sykes
Complete container generation forms and waste tracking forms and submit to site waste coordinator.	URSD	Jason G. Sykes
Evaluate pertinent information to determine applicability of listing codes to each investigation area (only as needed).	DuPont or URSD as requested by DuPont	Jason G. Sykes/ D. Spanfelner/ P. Mazierski
Evaluate analytical data to determine RCRA classification (characteristic codes for each waste stream).	DuPont or URSD as requested by DuPont	Jason G. Sykes/ D. Spanfelner/ P. Mazierski
Recommend waste characterization for each waste stream.	URSD only if requested by DuPont	Jason G. Sykes
Review and approve recommended waste characterization for each waste stream.	DuPont	Jason G. Sykes
Monitor and approve movement of waste into the waste accumulation area (drums).	DuPont	D. Sheldon
Inspect container and accumulation area weekly.	DuPont or URSD as requested by DuPont	D. Sheldon
Prepare shipping papers (i.e., manifests and LDR forms).	DuPont or URSD as requested by DuPont	D. Sheldon/ Jason G. Sykes
Prepare/submit related reporting and maintain all required documents.	DuPont	D. Sheldon

TABLE H-2
Anticipated Construction Activities Waste Streams
DuPont Lyndonville-West Ave site

Waste Stream	Proposed RCRA Classification	Anticipated Testing	Container Requirements and Estimated Volume	Labeling Requirements	Anticipated Disposal Method
Soil and Construction Debris	Non-hazardous	See Appendix G: Soil & Analytical Data	One 20-yd roll-off box.	"On-hold Pending Analysis," Date Containerized, Write unique container number on top third of drum. See section 5.2 of WMP.	Sending to CWM Chemical Services Model City Landfill.
Decontamination Water	Nonhazardous	None	Two 55-gallon drums	"Nonhazardous"- Decon water. See section 5.2 of WMP.	Water treatment facility owned by the municipality of Niagara Falls or by CECOS
PPE	Nonhazardous	None	Added to 20-yd roll-off box.	"Nonhazardous" See section 5.2 of WMP.	Sending to CWM Chemical Services Model City Landfill.

APPENDIX H
FORMS

WASTE CHARACTERIZATION FORM (WCF)

Date July 8, 1998

I. Location Lyndonville-West Avenue Site — Contractor's Code
EPA ID # Not applicable — DuPont Code LYN001
EPA Code Not applicable — State Code

II. Name of Waste Non-hazardous excavated soil

III. Composition

A. Major Components	C. One Time or Typical Analysis	D. Concentration Range Upper	D. Concentration Range Lower	E. Exposure Limits *ACGIH	E. Exposure Limits *OSHA
1. Surface soil (silt/clay/loam/roots)	90%				
2. Shredded tree limbs, wood debris	9.5%				
3. PPE (polyester tyvek suits, gloves)	0.5%				
4.					
5.					

B. Trace Components not listed above (PPM)

Ag <0.02* As 0.021* Ba 0.55* Cd <0.01* Cl* 0.000 Co 0.000 Cr <0.03*
Cu 65* F* 0.000 Hg <0.0002* I* 0.000 N* 0.000 Ni 13* P* 0.000
Pb <0.1* S* 0.000 Se <0.2* Zn 217* CR+6 0.000 Ti 0.000

Other DDT/DDD/DDE: total concentration in soil <1 mg/kg

Indicate Test Method:
TCLP X (results with superscripted x) TOTAL METALS X (results with superscripted y)

F. Does the waste contain:

Sulfides	NO
Cyanides	NO
PCBs	NO
Phenolics	NO
**Dioxin	NO
**Listed Solvent	NO
***Halogenated Organic Compounds 100 mg/l	NO
Insecticides, pesticides, herbicides, or rodenticides	YES

IV. Physical State @ 25°C STABLE SOLID
- Is there a dusting hazard if containers are opened? NO
- Multiple Phases? NO Vol. % of each phase 100 % Solid % Liquid
- Can the waste be pumped? NO poured? NO
- % Free flowing liquid layer 0 (volume %)
- Pressure of container 0 (psig)
- % Separate phase water 0 Estimated Specific Gravity

V. Shipping Containers
Bulk total of three 20 cyd luger boxes Container Spec.

Non-Bulk Size	Materials of Const.	Container Specification	Approx. Weight per Container	Container Label Used
NA				

VI. Properties
Flash Point *F (closed cup) Btu/lb Corrosive NO OSHA Carcinogen NO
Color Brown/tan/black pH Radioactive NO
Odor Possible slight sulfur odor Pyrophoric NO Etiological NO
Reactive NO Explosive NO
Toxic NO Shock Sensitive NO
Other

VII. D.O.T. Shipping Description NON-HAZARDOUS EXCAVATED SURFACE SOILS
D.O.T. Hazard Classification NOT DOT OR EPA REGULATED EPA Haz. Subst. NO RQ
D.O.T. Placard D.O.T. Label U.N. No. N.A. No.

VIII. Volume Annual Volume This Request Volume Per Shipment

IX. Remarks (Treatment of Spills/Safety Suggestions/MSDS)
No anticipated hazard or nuisance problems. Avoid direct contact between soil and exposed skin or dust inhalation

Prepared by Paul J. Mazzeo 7/8/98

*Organically bound **As defined in 40 CFR 261.31
***Per 40 CFR 261.1 and 40 CFR 268 App III

APPENDIX I
PROJECT SPECIFIC WASTE MANAGEMENT PROCEDURES FOR DUPONT LYNDONVILLE-WEST AVENUE SITE'S OPERATING ACTIVITIES

APPENDIX I
PROJECT SPECIFIC WASTE MANAGEMENT PROCEDURES FOR OPERATING ACTIVITIES

April 5, 2001

Project No. D1LY7236

DUPONT

CORPORATE REMEDIATION GROUP
An Alliance between
DuPont and URS Diamond

Barley Mill Plaza, Building 27
Wilmington, Delaware 19805

TABLE OF CONTENTS

Forms

Tables

1.1 DESCRIPTION OF ACTIVITIES AND WASTE STREAMS

DuPont will operate a leachate collection system and 6500 gallon storage tank at the Lyndonville-West Ave site. The following waste streams are anticipated to result from the operation of the temporary storage tank: leachate; and carbon canisters.

2.1 RCRA LISTING CODES

The applicability of RCRA listing codes is documented in Appendix E of this Waste Management Plan.

2.2 DETERMINATION OF RCRA CHARACTERIZATION CODES

The determination of whether the waste is characteristically hazardous is based on previous analytical results collected from the DuPont Lyndonville-West Ave site and generator knowledge.

A waste exhibits RCRA characteristics of toxicity and carries a characteristic code if, by using the TCLP method, the extract from a representative sample of the waste contains a specific contaminant at concentrations equal to or greater than its representative toxicity characteristic level.

Analytical results from soil samples analysis from Lyndonville-West Ave site and groundwater analysis for the DuPont Lyndonville-West Ave site (see Appendix G) indicate that the site can best be described by a non-RCRA classification. Therefore, RCRA characteristics will be determined based on these analytical results and generator knowledge. Leachate collected from the Lyndonville Site will be managed as non-hazardous.

2.3 WASTE MANAGEMENT PROCEDURES

A description of the waste streams that will be generated and expected disposal methods are presented in the following:

- Leachate — Pumped from the landfill at the DuPont Lyndonville — West Ave site:

  Based on available leachate modeling results, approximately 250,000 to 800,000 gallons of leachate may be pumped annually from the landfill to the temporary storage tank at the Lyndonville-West Ave site. The non-hazardous leachate will be loaded and sent to the City of Niagara Falls Publicly Owned Treatment Works or to the CECOS commercial water treatment plant, both located in Niagara Falls, New York. The material will be shipped to these facilities using a bill of lading (or when shipped to CECOS, a NON-hazardous manifest). Both facilities will be used; however, the majority of the leachate will be sent to the City of Niagara Falls Public Owned Treatment Works. The basis for shipping to both facilities will be to provide adequate back-up treatment options. A 5,000-gallon vacuum tanker truck owned and operated by Haz Mat Environmental group will be transporting the material to both facilities.

- Carbon vent canisters:

  Carbon vent canisters will be connected to the storage tank. Air from the tank will be passively piped through the carbon canisters to remove organic and sulfide odors before being passively vented to the atmosphere. The initial drums of carbon that become spent from the system will be sampled and analyzed for organic and sulfide contamination prior to the return to Calgon Carbon for regeneration. The analytical results from this sampling will be used to classify this carbon properly as hazardous or as non-hazardous. The carbon canisters should be labeled in accordance with section 5.2 of the Waste Management Plan. Note: Changes in labeling and marking requirements of the carbon could occur based on the sampling data of the initially used carbon canisters.

Table I-1
DuPont Lyndonville-West Ave Site

CONSTRUCTION PROJECT RESPONSIBILITIES

Task	Organization	Individual
Conduct waste coordinator duties (unless specified elsewhere).	URS Diamond (URSD)	J. G. Sykes
Oversee waste management activities.	URSD	J. G. Sykes
Coordinate sampling activities.	URSD	D. Sheldon
Select and oversee waste transportation and disposal contractors. Selection Oversight	 DuPont DuPont or Designate	 J. G. Sykes
Coordinate contract laboratory.	URSD	D. Sheldon
Review analytical data and submit data to site environmental coordinator for waste characterization determination.	DuPont or URSD	J. G. Sykes
Mark containers.	URSD	D. Sheldon
Complete container generation forms and waste tracking forms and submit to site waste coordinator.	URSD	J. G. Sykes
Evaluate pertinent information to determine applicability of listing codes to each investigation area (only as needed).	DuPont or URSD as requested by DuPont	Jason G. Sykes/ D. Spanfelner/ P. Mazierski
Evaluate analytical data to determine RCRA classification (characteristic codes for each waste stream).	DuPont or URSD as requested by DuPont	J.G. Sykes/ D. Spanfelner/ P. Mazierski
Recommend waste characterization for each waste stream.	URSD **only if** requested by DuPont	J. G. Sykes
Review and approve recommended waste characterization for each waste stream.	DuPont	J. G. Sykes
Monitor and approve movement of waste into the waste accumulation area (drums).	DuPont	D. Sheldon
Inspect container and accumulation area weekly.	DuPont or URSD as requested by DuPont	D. Sheldon
Prepare shipping papers (i.e., manifests and LDR forms).	DuPont or URSD as requested by DuPont	D. Sheldon/J.G. Sykes
Prepare/submit related reporting and maintain all required documents.	DuPont	D. Sheldon

JGS
10-12-00

TABLE I-2
Anticipated Operating Waste Streams
DuPont Lyndonville-West Ave Site

Waste Stream	Proposed RCRA Classification	Anticipated Testing	Container Requirements and Estimated Volume	Labeling Requirements	Anticipated Disposal Method
Waste Stream No. 1-Leachate	Non-RCRA	See Table Appendix G: Soil & Analytical Data	Pretreatment tank 400,000-800,000 gallons	Non-Hazardous See section 5.2 of WMP.	Water treatment facility owned by the municipality of Niagara Falls or by CECOS.
Waste Stream No. 2-Carbon	TBD	TCLP Organics & Total Sulfide	55-1A1/1A2 drum (3-12 drums annually)	See section 5.2 of WMP.	Send back to Calgon Carbon for recycle.

APPENDIX I
FORMS

WASTE CHARACTERIZATION FORM (WCF)

Date 10/17/00

I. Location DuPont Lyndonville
EPA ID #
EPA Code
Contractor's Code
DuPont Code LYN-LEA
State Code

II. Name of Waste Leachate

III. Composition

A. Major Components	C. One Time or Typical Analysis	D. Concentration Range Upper	D. Concentration Range Lower	E. Exposure Limits *ACGIH	E. Exposure Limits *OSHA
1. Leachate	100%				
2.					
3.					
4.					
5.					

B. Trace Components not listed above (PPM)

Ag ____ As <1 ppm Ba ____ Cd ____ Cl* ____ Cn ____ Cr ____
Cu ____ F* ____ Hg ____ I* ____ N* ____ Ni ____ P* ____
Pb ____ S* ____ Se ____ Zn ____ CR+6 ____ Tl ____
Other

Indicate Test Method:
EPTOX/TCLP ____ TOTAL METALS X

F. Does the waste contain:

Sulfides	Yes
Cyanides	No
PCBs	No
Phenolics	No
**Dioxin	No
**Listed Solvent	No
***Halogenated Organic Compounds 100 mg/l	No
Insecticides, pesticides, herbicides, or rodenticides (see attached analysis)	Yes

IV. Physical State @ 25°C
- Is there a dusting hazard if containers are opened? No
- Multiple Phases? No Vol. % of each phase ____ % Solid 100 % Liquid
- Can the waste be pumped? Yes poured? Yes
- % Free flowing liquid layer 100 (volume %)
- Pressure of container 0 (psig)
- % Separate phase water 100 Estimated Specific Gravity 1.0

V. Shipping Containers
Bulk 5,000 tanker Container Spec.

Non-Bulk Size	Materials of Const.	Container Specification	Approx. Weight per Container	Container Label Used

VI. Properties
Flash Point >200 °F (closed cup) Btu/lb ____ Corrosive No OSHA Carcinogen No
Color Clear to black pH 6-11 Radioactive No
Odor Sulfide Pyrophoric No Etiological No
Reactive No Explosive No
Toxic No Shock Sensitive No
Other

VII. D.O.T. Shipping Description Non-hazardous; non-regulated
D.O.T. Hazard Classification EPA Haz. Subst. ____ RQ ____
D.O.T. Placard ____ D.O.T. Label U.N. No. ____ N.A. No. ____
Emergency Response Guide No. ____

VIII. Volume Annual 400,000-800,000 Volume This Request ____ Volume Per Shipment ____

IX. Remarks (Treatment of Spills/Safety Suggestions/MSDS)

*Organically bound **As defined in 40 CFR 261.31
***Per 40 CFR 261.1 and 40 CFR 268 App III

Prepared by

VIII. Volume Annual 400,000-800,000 Volume This Request ____ Volume Per Shipment ____

IX. Remarks (Treatment of Spills/Safety Suggestions/MSDS)

*Organically bound **As defined in 40 CFR 261.31
***Per 40 CFR 261.1 and 40 CFR 268 App III

Prepared by

APPENDIX J

PROJECT SPECIFIC WASTE MANAGEMENT PROCEDURES FOR DUPONT LYNDONVILLE-WEST AVENUE SITE'S INVESTIGATION ACTIVITIES

APPENDIX J
PROJECT SPECIFIC WASTE MANAGEMENT PROCEDURES FOR INVESTIGATION ACTIVITIES

April 5, 2001

Project No. D1LY7236

CORPORATE REMEDIATION GROUP
An Alliance between
DuPont and URS Diamond

Barley Mill Plaza, Building 27
Wilmington, Delaware 19805

TABLE OF CONTENTS

Forms

Tables

1.1 DESCRIPTION OF ACTIVITIES AND WASTE STREAMS

Supplemental Remedial Investigation (SRI) of the Lyndonville-West Avenue site in the Village of Lyndonville, Town of Yates, Orleans County, New York, is being conducted pursuant to an Administrative Consent Order (ACO) with the New York State Department of Environmental Conservation (NYSDEC). As discussed in a meeting between DuPont and NYSDEC on October 19, 1998, the SRI scope includes additional investigation of the following areas:

- Additional characterization and delineation of arsenic concentrations in the intermittent ditch system between Monroe Electronics and the box culvert south of the main H.H. Dobbins facility
- Soil sampling in the Krenite can removal area
- Limited sediment sampling at the terminus west of the West Avenue Industrial Sewer
- Evaluation of groundwater as a migration pathway for arsenic observed in the ditch system near Monroe Electronics

The following waste streams are anticipated to result from the SRI activities:

- Soil sample media from the SRI
- Personal Protection Equipment from the SRI
- Groundwater samples from SRI
- Decon water

2.1 RCRA LISTING CODES

The applicability of RCRA listing codes is documented in Appendix E of this Waste Management Plan.

2.2 DETERMINATION OF RCRA CHARACTERIZATION CODES

The determination of whether the waste is characteristically hazardous is based on previous analytical results collected from the DuPont Lyndonville-West Ave site and generator knowledge.

A waste exhibits RCRA characteristics of toxicity and carries a characteristic code if, by using the TCLP method, the extract from a representative sample of the waste contains a specific contaminant at concentrations equal to or greater than its representative toxicity characteristic level.

Analytical results from soil samples analysis from Lyndonville-West Ave site and groundwater analysis for the DuPont Lyndonville-West Ave site (see Appendix G) indicate that the site can best be described by a non-hazardous and non-regulated classification. Therefore, RCRA characteristics will be determined based on these analytical results and generator knowledge. The material generated during the Lyndonville investigation is therefore, anticipated to be non-hazardous.

2.3 WASTE MANAGEMENT PROCEDURES

A description of the waste streams that will be generated during construction activities and expected disposal methods are presented in the following sections:

- Soil sampling dedicated media from the SRI:

  Soil sampling media will be generated as a result of the investigation of the intermittent ditch system between Monroe Electronics, the box culvert south of the main H.H. Dobbins facility, the Krenite can removal area, and West Avenue industrial sewer sediment. It is estimated that 1-2 drums of soil will be generated. The soil will be containerized in a roll-off box. This material is considered non-hazardous because it will be decontaminated prior to drumming and that the material (aluminum trays) will not absorb and, therefore, exhibit any hazardous characteristics. This material will be sent to CWM Chemical Services Model City Subtitle-C landfill in the drums it was generated in.

- Decontamination water- decontamination of site construction equipment:

  Approximately 110 gallons of waste decontamination water may be generated from the steam cleaning or washing of site investigation equipment during decontamination activities. Only water from steam cleaning or tap water with alconox detergent will be used during decon. No other cleaning materials will be used during decontamination. The decon water will be stored in two 55-gallon open-head drums and labeled as non-hazardous decon water. The material will be pumped from the drums into the temporary

storage tank once it is operational or will be evacuated with the first load of leachate sent off site for treatment. The remaining solids will be placed in the roll-off box being sent to CWM Chemical Services Model City landfill.

- Personal Protection Equipment (PPE):

  PPE generated from the investigation will be drummed and destined for CWM Chemical Services Model City Subtitle-C landfill. Approximately 20-50 pounds of PPE will be collected and containerized.

- Groundwater from SRI:

  Approximately 1-2 55-gallon drums of groundwater will be generated during the SRI. This material is considered non-hazardous based groundwater data (see Appendix G). This material will be drummed and then vacuumed off to the leachate tanker being shipped to Niagara Falls Publicly Owned Treatment Works.

Table J-1

DuPont Lyndonville-West Ave Site

INVESTIGATION PROJECT RESPONSIBILITIES

Task	Organization	Individual
Conduct waste coordinator duties (unless specified elsewhere).	URS Diamond Group (URSD)	Jason G. Sykes
Oversee waste management activities.	URSD	Jason G. Sykes
Coordinate sampling activities.	URSD	D. Sheldon
Select and oversee waste transportation And disposal contractors. Selection Oversight	 DuPont DuPont or Designate	Jason G. Sykes
Coordinate contract laboratory.	URSD	D. Sheldon
Review analytical data and submit data to site environmental coordinator for waste characterization determination.	DuPont or URSD	Jason G. Sykes
Mark containers.	URSD	Jason G. Sykes
Complete container generation forms and waste tracking forms and submit to site waste coordinator.	URSD	Jason G. Sykes
Evaluate pertinent information to determine applicability of listing codes to each investigation area (only as needed).	DuPont or URSD as requested by DuPont	Jason G. Sykes/ D. Spanfelner/ P. Mazierski
Evaluate analytical data to determine RCRA classification (characteristic codes for each waste stream).	DuPont or URSD as requested by DuPont	Jason G. Sykes/ D. Spanfelner/ P. Mazierski
Recommend waste characterization for each waste stream.	URSD only if requested by DuPont	Jason G. Sykes
Review and approve recommended waste characterization for each waste stream.	DuPont	Jason G. Sykes
Monitor and approve movement of waste into the waste accumulation area (drums).	DuPont	D. Sheldon
Inspect container and accumulation area weekly.	DuPont or URSD as requested by DuPont	D. Sheldon
Prepare shipping papers (i.e., manifests and LDR forms).	DuPont or URSD as requested by DuPont	D. Sheldon/ Jason G. Sykes
Prepare/submit related reporting and maintain all required documents.	DuPont	D. Sheldon

TABLE J-2
Anticipated SRI Waste Streams
DuPont Lyndonville-West Ave Site

Waste Stream	Proposed RCRA Classification	Anticipated Testing	Container Requirements and Estimated Volume	Labeling Requirements	Anticipated Disposal Method
Groundwater	Non-RCRA	See Appendix G: Soil & Analytical Data	55-1A1/1A2 drum (1-2 drums)	Non-Hazardous See section 5.2 of WMP.	Water treatment facility owned by the municipality of Niagara Falls or by CECOS.
Decontamination Water	Nonhazardous	None	Two 55-gallon drums	Nonhazardous-Decon water. See section 5.2 of WMP.	Water treatment facility owned by the municipality of Niagara Falls or by CECOS
Soil Media	Nonhazardous	See Appendix G: Soil & Analytical Data	Two 55-gallon drums	Nonhazardous-See section 5.2 of WMP.	Sending to CWM Chemical Services Model City Landfill.

JGS
10/16/00

APPENDIX J
FORMS

WASTE CHARACTERIZATION FORM (WCF)

Date 10/17/00

I. Location DuPont Lyndonville
EPA ID #
EPA Code
Contractor's Code
DuPont Code LYN-LBA
State Code

II. Name of Waste Leachate

III. Composition

A. Major Components	C. One Time or Typical Analysis	D. Concentration Range Upper	D. Concentration Range Lower	E. Exposure Limits *ACGIH	E. Exposure Limits *OSHA
1. Leachate	100%				
2.					
3.					
4.					
5.					

B. Trace Components not listed above (PPM)

Ag ____ As <1 ppm Ba ____ Cd ____ Cl* ____ Cn ____ Cr ____
Cu ____ F* ____ Hg ____ I* ____ N* ____ Ni ____ P* ____
Pb ____ S* ____ Se ____ Zn ____ CR+6 ____ Ti ____
Other

Indicate Test Method:
EPTOX/TCLP ____ TOTAL METALS X

F. Does the waste contain:

Sulfides	Yes
Cyanides	No
PCBs	No
Phenolics	No
**Dioxin	No
**Listed Solvent	No
***Halogenated Organic Compounds 100 mg/l	No
Insecticides, pesticides, herbicides, or rodenticides (see attached analysis)	Yes

IV. Physical State @ 25°C

- Is there a dusting hazard if containers are opened? No
- Multiple Phases? No Vol. % of each phase ____ % Solid 100 % Liquid
- Can the waste be pumped? Yes poured? Yes
- % Free flowing liquid layer 100 (volume %)
- Pressure of container 0 (psig)
- % Separate phase water 100 Estimated Specific Gravity 1.0

V. Shipping Containers
Bulk 5,000 tanker Container Spec.

Non-Bulk Size	Materials of Const.	Container Specification	Approx. Weight per Container	Container Label Used

VI. Properties

Flash Point >200 °F (closed cup) Btu/lb ____ Corrosive No OSHA Carcinogen No
Color Clear to black pH 6-11 Radioactive No
Odor Sulfide Pyrophoric No Etiological No
Reactive No Explosive No
Toxic No Shock Sensitive No
Other

VII. D.O.T. Shipping Description Non-hazardous; non-regulated

D.O.T. Hazard Classification EPA Haz. Subst. ____ RQ ____
D.O.T. Placard ____ D.O.T. Label ____ U.N. No. ____ N.A. No. ____
Emergency Response Guide No. ____

VIII. Volume Annual 400,000-800,000 Volume This Request ____ Volume Per Shipment ____

IX. Remarks (Treatment of Spills/Safety Suggestions/MSDS)

*Organically bound **As defined in 40 CFR 261.31
***Per 40 CFR 261.1 and 40 CFR 268 App III

Prepared by

VIII. Volume Annual 400,000-800,000 Volume This Request ____ Volume Per Shipment ____

IX. Remarks (Treatment of Spills/Safety Suggestions/MSDS)

*Organically bound **As defined in 40 CFR 261.31
***Per 40 CFR 261.1 and 40 CFR 268 App III

Prepared by

APPENDIX D

MANUFACTURER'S EQUIPMENT SPECIFICATIONS AND O&M MANUALS

D-1

SUBMERSIBLE PUMP

FLYGT®

SX-2, SX-3, SX-3VX

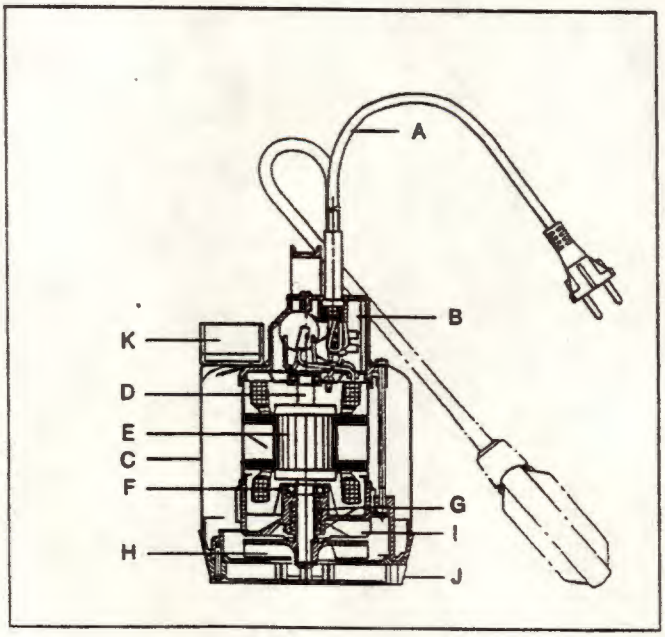
Submersible Pump

Small (fractional horsepower) Dewatering Pumps

Capacity up to 57 GPM, Heads up to 33 ft.

Applications:

SX series pumps are designed for basement and general utility pumping of clean water.



Specifications

A **Cable.** Standard 10 ft. AWG 18 cord with plug. Cable strain relief clamp.

B **Junction Chamber.** The pump top is made of non-corrosive, fiberglass reinforced Noryl. Cable entry incorporates a molded grommet controlled compression sealing. The junction chamber incorporates the motor capacitor for single phase run.

C **Pump Housing.** Non-corrosive, lightweight stainless steel ANSI 304 body. Static seals are leakproof Nitrile rubber O rings.

D **Shaft.** Stainless steel ANSI 303.

E **Motor.** Air filled, with class B (120°C) insulation; 2 pole, 3450 rpm. Shrink-fit to the motor housing. Allows for up to 40 starts per hour. Built-in thermal sensors for motor overload protection.

F **Bearings.** Upper and lower: single row ball bearing.

G **Shaft Seals.** Triple lip seals running in environmentally friendly, FDA approved (Standard #172.878) lubricant. Oil specs: 0.4 pints (0.2 l).

H **Impeller.** Multivane, open type (SX-2 and SX-3) or vortex type (SX-3VX). Material: Fiberglass reinforced Noryl.

I **Diffuser.** Fiberglass reinforced Noryl.

J **Strainer.** Fiberglass reinforced Noryl. Solids size: 3/8" (SX-2, SX-3) or 3/4" (SX-3VX).

K **Discharge:** 1-1/4" NPT female.

Fasteners. Stainless steel ANSI 304.

Controls: (not shown).
Built-in capacitor. Built-in float switch for automatic, unattended operation. Adjustable start-stop levels.

ITT Flygt is a member of the following Associations:

National Mining Association

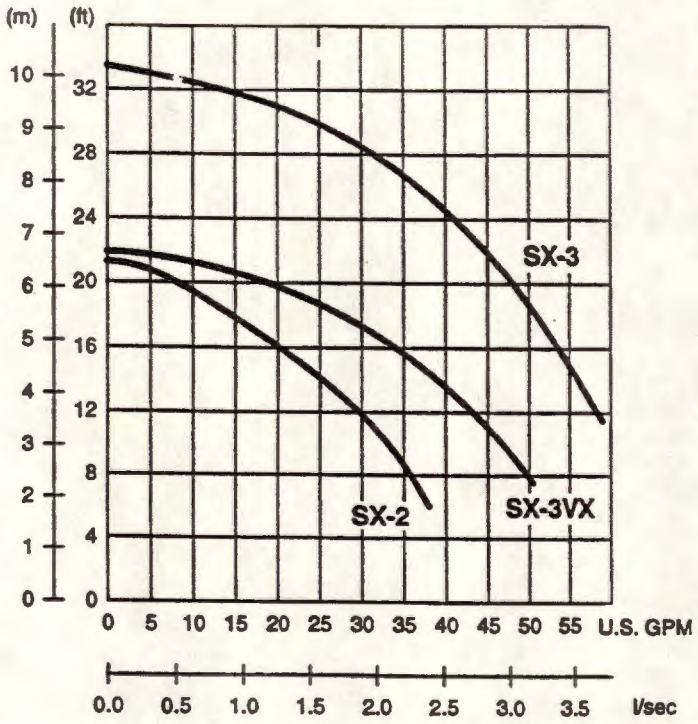
AED

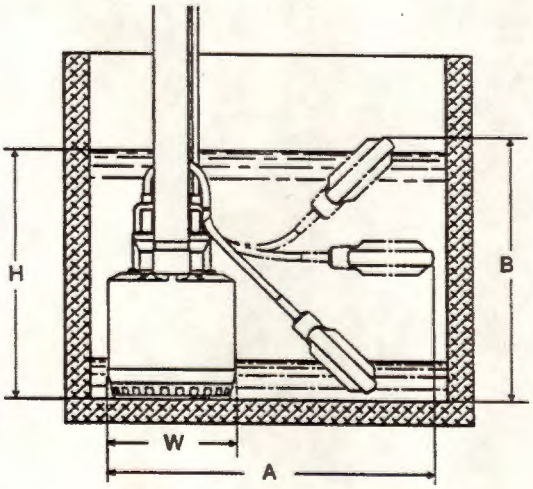
ARA® american rental association

CIMA

Revised By Marcia 11/28/00

Performance Data





Dimensions

Model	W inches	W mm	H inches	H mm	A inches	A mm	B inches	B mm	Weight lbs.	Weight kg
SX-2	6 1/8	156	9 5/8	245	15 1/2	394	13	330	9	4.1
SX-3	6 1/8	156	11 1/4	286	15 1/2	394	14 1/2	368	13 1/4	6.0
SX-3VX	6 7/8	175	12 1/4	311	15 1/2	394	15 1/2	394	13 1/4	6.0

VERSION	HP	PHASE	VOLTS	FLA	LRA	CABLE SIZE AWG
SX-2	0.25	1	115	2.8	11	18/3
SX-3	0.75	1	230	3.4	13	18/3
SX-3VX	0.75	1	230	3.4	13	18/3

FLYGT
An ITT Industries company

ITT FLYGT CORPORATION, 35 Nutmeg Dr., P.O. Box 1004, Trumbull, CT 06611-0943. Tel. (203) 380-4700 Telefax (203) 380-4705
ITT Flygt Canada, 300 Labrosse Ave., Pointe Claire (Montreal) P.Q. H 9R-4V5. (514) 695-0100

LYGT

cod. 00107324 99

I	SX - SXV - DX - DXV - STA - DL - DLV	Istruzioni installazione ed uso - Sicurezza - Dichiarazione di conformità
GB	SX - SXV - DX - DXV - STA - DL - DLV	Instructions for installation and use - Safety - Declaration of conformity
F	SX - SXV - DX - DXV - STA - DL - DLV	Instructions pour installation et l'emploi - Sécurité – Déclaration de conformité
D	SX - SXV - DX - DXV - STA - DL - DLV	Installations- und Bedienungsanleitungen - Sicherheit - Konformitätserklärung
E	SX - SXV - DX - DXV - STA - DL - DLV	Instrucciones de instalación y uso. Seguridad. Declaración de Conformidad.
P	SX - SXV - DX - DXV - STA - DL - DLV	Instruções de instalação e uso - Segurança - Declaração de conformidade
NL	SX - SXV - DX - DXV - STA - DL - DLV	Aanwijzingen voor de installatie en het gebruik - Veiligheidsvoorschriften - Verklaring van overeenstemming
DK	SX - SXV - DX - DXV - STA - DL - DLV	Instruktioner vedrørende installation og brug - Sikkerhed - Overensstemmelseserklæring
S	SX - SXV - DX - DXV - STA - DL - DLV	Instruktioner för installation och användning - Säkerhet – Försäkran om överensstämmelse
N	SX - SXV - DX - DXV - STA - DL - DLV	Instruksjoner for installasjon og bruk - Sikkerhet - Overensstemmelseserklæring
FIN	SX - SXV - DX - DXV - STA - DL - DLV	Asennus- ja käyttöohjeet - Turvallisuus - vakuutus yhdenmukaisuudesta
GR	SX - SXV - DX - DXV - STA - DL - DLV	Οδηγίες εγκατάστασης και χρήσης - Ασφάλεια - Δήλωση συμμόρφωσης
TR	SX - SXV - DX - DXV - STA - DL - DLV	Yerleştirme ve kullanım bilgileri - Emniyet Uygunluk beyanı
AR	SX - SXV - DX - DXV - STA - DL - DLV	تعليمات التركيب والاستخدام والأمان - تصريح صناعة طبق الأصول
RUS	SX - SXV - DX - DXV - STA - DL - DLV	Инструкции по установке и эксплуатации - Безопасность - Декларация соответствия
PL	SX - SXV - DX - DXV - STA - DL - DLV	Instrukcja obsługi - Zasady bezpieczeństwa - Deklaracja zgodności

Flygt

ITT Industries

GB 1. HANDLING

The product must be lifted and handled with care using the handle or the eyebolt.

2. APPLICATIONS

The pump is suitable for the transfer of clean, dirty or turbid liquids, with suspended solids not exceeding the dimensions indicated below. The most common uses are: drainage of domestic wastewater, collection tanks of rainwater collection tanks, of flooded rooms of excavations and trenches in the building industry. The versions with the VORTEX impeller are also suitable for liquids with suspended filaments.

3. WORKING LIMITS

⚠ EN standard 60335-2-41 forbids the use of the pump in tanks or swimming pools while people are in the water, and requires the use of the 10 m cable version for external applications.

Liquid temperature: ≤ 35°C

N.B.: When operating continuously the pumps must be entirely submersed, with the exception of the SX2-3 and SX5-15 models.

Maximum immersion depth: 5 m (7 m for the SX5-15 models)

Max. diameter of suspended solids (mm)

STA	SX5-7 11-15	SX2 SX3	SXV3	DX35 DXV35	DL45-DL46 DLV45-DLV46	DL50 DLV50
5	8	10	20	35	45	50

Max. number of starts per hour

DL - STA	SX5-7-11-15, DX	SX2-SX3-SXV3
20	25	40

4. INSTALLATION (typical diagram FIG. 1)

The well dimensions must be such as to prevent an excessive number of starts per hour (FIG. 2). The float is adjusted by increasing or diminishing the free length of the cable (FIG. 3).

⚠ Improper adjustments may cause malfunctions.

5. ELECTRICAL CONNECTION

SINGLE-PHASE VERSIONS: insert the plug in a standard power outlet.

NOTE: The single-phase version electric pumps are fitted with a built-in automatic reset magneto-thermal protection.

THREE-PHASE VERSION: FIG. 4

5.1 Direction of rotation (only for three-phase version)

The proper rotation direction is clockwise when looking at the pump from above. Check by observing the pump performance. The correct direction of rotation is the one that generates higher Q/H performances for single-channel and double-channel versions, and lower rates of absorption for the VORTEX impeller versions.

6. MAINTENANCE

⚠ **The pump should be serviced by qualified personnel only, and after having been disconnected from the power mains.**

The pump does not require any routine maintenance. It may occasionally be necessary to clean the suction screen (SX, STA) or the impeller. To access the impeller on models equipped with

GB 7. SAFE[illegible]NSTRUCTION

FIG. 5 The pump is not suitable for use [illegible] dangerous liquids.

FIG. 6 Do not use the power supply cable [illegible] pump.

FIG. 7 Do not allow the pump to run dry or [illegible] water.

FIG. 8 As the pump can start and stop [illegible] insert your hands or other objects in it while it [illegible] power mains.

FIG. 9 The power plug and capacitor cannot be submerged.

FIG. 10 Pay attention to the working limits. In [illegible]age the pump and other property, and injure [illegible]

FIG. 11 Make sure that the rated voltage [illegible] voltage.

FIG. 12 If the pump is a three-phase model [illegible] mains connection and grounding are per[illegible] personnel (certified electrician).

FIG. 13 As additional protection from lethal [illegible] high sensitivity differential switch (0.03 A)

FIG. 14 Make sure that unauthorized per[illegible] access to the pump.

FIG. 15 Disconnect the electric pump, or [illegible] fitted with a plug) before moving it [illegible] maintenance or cleaning operations.

FIG. 16 Use the pump only within the speed [illegible] the rating plate.

FIG. 17 Caution! Avoid icing.

FIG. 18 Protect the pump from clogging.

FIG. 19 Prevent any accidental power failure [illegible] battery operated back-up power supply).

FIG. 20 Wear gloves during any pump servic[illegible]

8. TROUBLESHOOTING

THE PUMP DOES NOT START: • Make sure [illegible] erly inserted in the power socket and that the [illegible] ground fault interrupter or circuit breaker if it [illegible] thermo-amperometric protection incorporated [illegible] versions may have activated; it will reset aut[illegible] minutes, once the motor has cooled. If any co[illegible] tions mentioned above kicks off again, call a q[illegible]

THE MOTOR STARTS BUT THE PUMP DO[illegible] • Make sure that the water level is not too low [illegible] port or delivery pipe are not clogged

THE PUMP'S DELIVERY IS REDUCED: • [illegible] make sure that the rotation direction on the [illegible] is correct.

THE PUMP WORKS INTERMITTENTLY: • [illegible] incorrectly • The well is too small • Excessive [illegible] • Clogged pump or pipes.

9. NOISE

Not applicable when the pump works compl[illegible] any case, below 70 dB(A) if the pump is sub[illegible] merged.

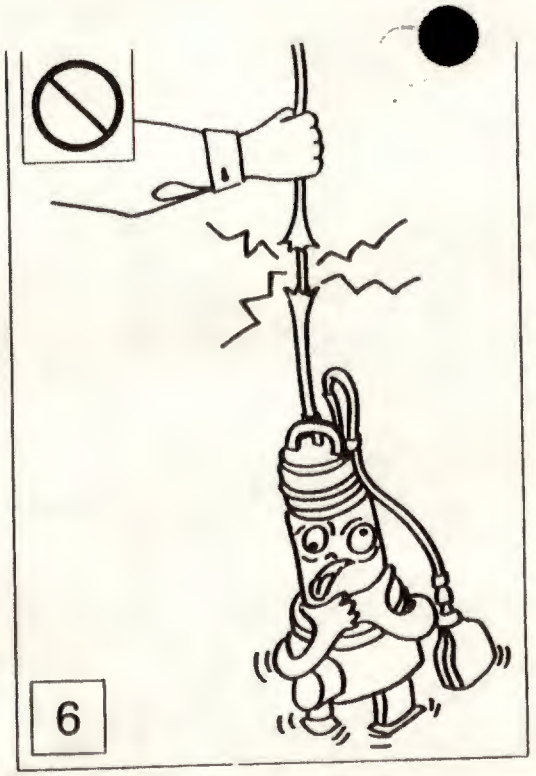
10. DECLARATION OF CONF[illegible]

PRODUCTS: SX-SXV-DX-DXV-STA-DL-DL[illegible]
Made in Italy.

The products listed above comply with [illegible] of Machine Directive 98/037[illegible] 73/23/EEC and related addenda, Electromagnetic Compatibility Directive [illegible] addenda.

SIGNATURE/TITLE [illegible] Rental Quality [illegible]


5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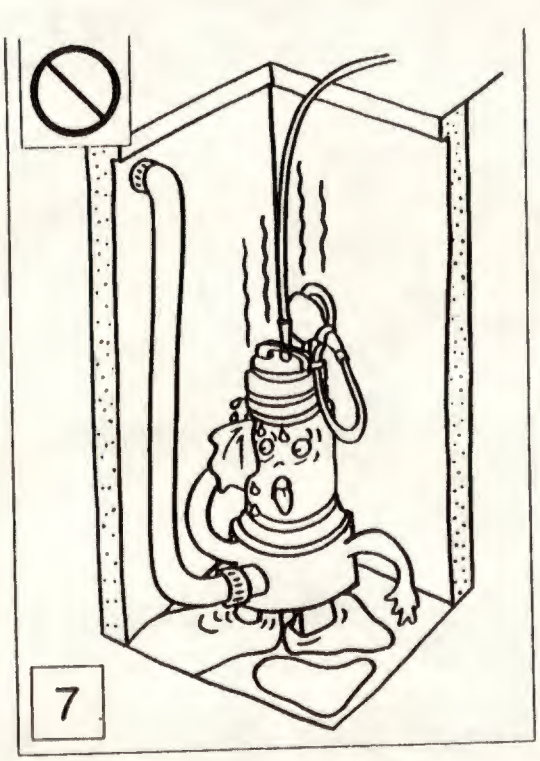
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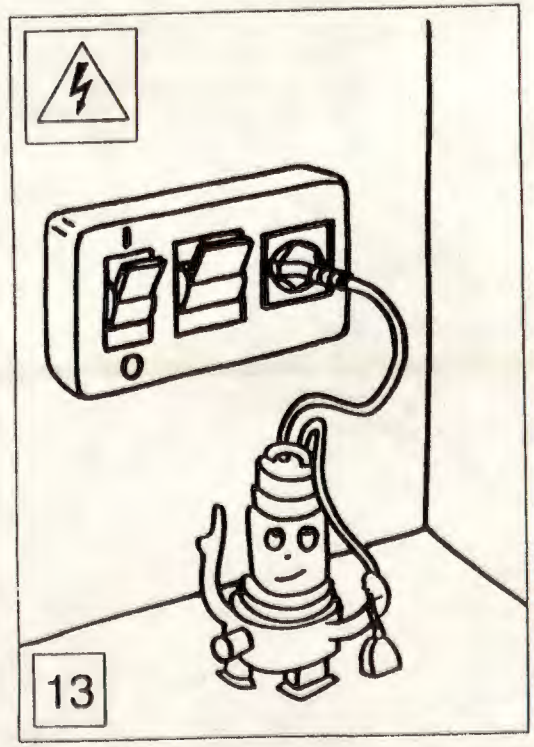
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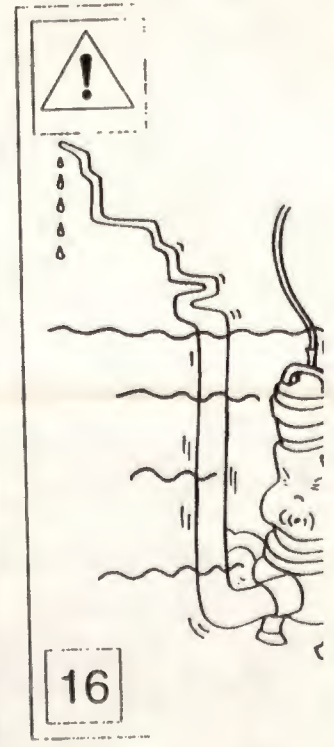
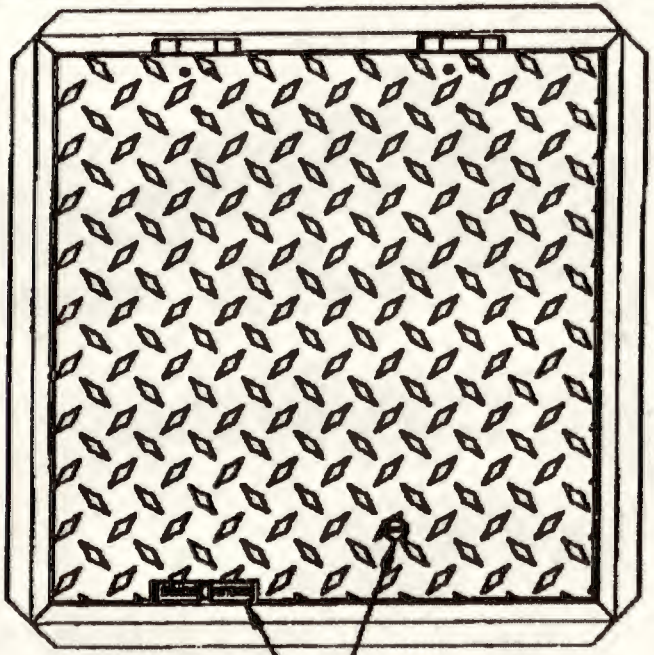
14

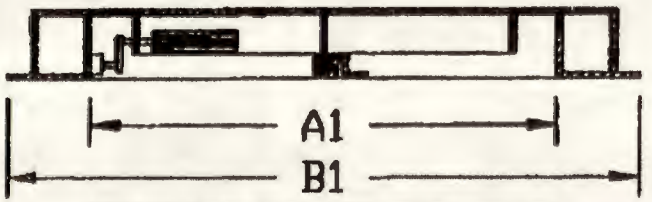

380v3~
ON
OFF
230v1~
15


16

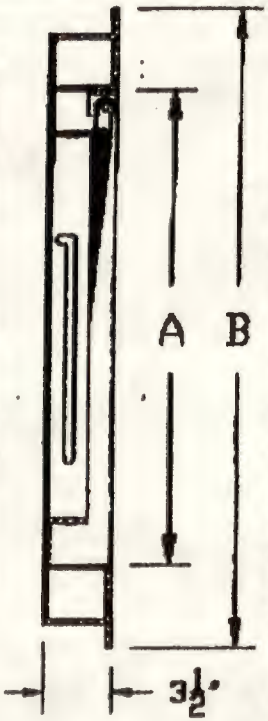
D-2

MANHOLE HATCH





DRAWING NOT TO SCALE



NOTES:

1.) STYLE "CH-AL" ACCESS HATCH, AS MANUFACTURED BY SYRACUSE CASTINGS SALES CORP. CICERO, NEW YORK (315-699-2601).

2.) MATERIAL SHALL BE 6061-T6 ALUMINUM FOR BARS, ANGLES, AND EXTRUSION. 1/4" DIAMOND PLATE SHALL BE 5086 ALUMINUM.

3.) UNIT DESIGNED LIGHT DUTY, FOR A MINIMUM LIVE LOAD OF 300 LBS./SQ.FT. DEFLECTION SHALL NOT EXCEED 1/150 OF THE SPAN.

4.) UNIT SUPPLIED WITH A HEAVY DUTY STAINLESS STEEL PNEU-SPRING, FOR EASE OF OPERATION WHEN OPENING COVER. COVER SHALL BE COUNTERBALANCED, SO ONE PERSON CAN EASILY OPEN THE HATCH DOOR.

5.) FRAME SHALL BE OF EXTRUDED ALUMINUM WITH A CONTINUOUS 1-1/4" ANCHOR FLANGE. A DOVE TAIL GROOVE SHALL BE EXTRUDED INTO THE SEAT OF THE FRAME FOR A 1/8" SILICONE GASKET.

6.) EACH HATCH SHALL BE EQUIPPED WITH AN ALUMINUM HOLD OPEN ARM. DOOR SHALL LOCK OPEN IN THE 90 DEGREE POSITION. HOLD OPEN ARM SHALL HAVE A RED VINYL GRIP HANDLE AND FASTENED TO THE FRAME WITH A 1/2" GRADE 316 STAINLESS STEEL BOLT.

7.) HINGES SHALL BE OF HEAVY DUTY DESIGN. MATERIAL SHALL BE GRADE 316 STAINLESS STEEL. EACH HINGE SHALL HAVE A GRADE 316 STAINLESS STEEL, 3/8" DIAMETER HINGE PIN. HINGE SHALL BE FASTENED TO THE CHANNEL AND DIAMOND PLATE WITH GRADE 316 STAINLESS STEEL BOLTS AND NY-LOCK NUTS.

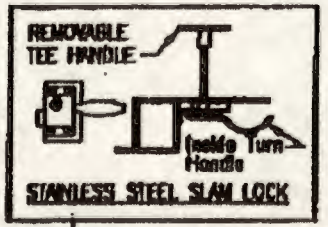
8.) EXTERIOR OF FRAME WHICH COMES IN CONTACT WITH CONCRETE SHALL HAVE ONE COAT BLACK BITUMINOUS PAINT.

9.) EACH HATCH SHALL BE SUPPLIED WITH A GRADE 316 STAINLESS STEEL SLAM LOCK, WITH KEYWAY PROTECTED BY A THREADED ALUMINUM PLUG. PLUG SHALL BE FLUSH WITH TOP OF 1/4" DIAMOND PLATE. SLAM LOCK SHALL BE FASTENED WITH GRADE 316 STAINLESS STEEL BOLTS AND WASHERS.

10.) EACH HATCH SHALL BE EQUIPPED WITH AN ALUMINUM LIFT HANDLE. LIFT HANDLE SHALL BE FLUSH WITH TOP OF 1/4" DIAMOND PLATE.

11.) EACH "CH-AL" STYLE HATCH IS SUPPLIED WITH A 1-1/2" THREADED DRAIN COUPLER ON THE UNDERSIDE OF CHANNEL FRAME, FOR PIPE CONNECTION.

PATTERN NO.	DIMENSIONS IN INCHES	
ALUMINUM	A x A1	B x B1
CH-1AL	24" x 24"	32-1/2" x 32-1/2"
CH-2AL	30" x 30"	38-1/2" x 38-1/2"
CH-4AL	36" x 36"	44-1/2" x 44-1/2"
CH-5AL	42" x 42"	50-1/2" x 50-1/2"



STAINLESS STEEL SLAM LOCK

"CH-AL" STYLE LIGHT DUTY
ALUMINUM HATCH

DRAWN BY: ARO	DATE: 09/21/98	DRAWING # CH-SD

SYRACUSE CASTINGS SALES CORP.
P.O. Box 1821 / 6177 South Bay Rd.
Cicero, N.Y. 13039
315-699-2601 Fax # 315-699-2982
www.syrcast.com

Revised by Bruce 11/18/98

D-3

BAKER TANK

GAUGE TABLE FOR BAKER 6500 GAL. POLY TANK

(TOTAL DRAIN & ORIGINAL STYLE)

Increments of 1 inch. 1 bbl. = 42 U.S. gal.

Inch.	Gallons	Barrels	Feet
0	0	0.0	0
1	48	1.2	
2	97	2.3	
3	145	3.5	
4	194	4.6	
5	242	5.8	
6	291	6.9	1/2
7	339	8.1	
8	388	9.2	
9	436	10.4	
10	484	11.5	
11	533	12.7	
12	581	13.8	1
13	630	15.0	
14	678	16.1	
15	727	17.3	
16	775	18.5	
17	823	19.6	
18	872	20.8	1 1/2
19	920	21.9	
20	969	23.1	
21	1017	24.2	
22	1066	25.4	
23	1114	26.5	
24	1163	27.7	2
25	1211	28.8	
26	1259	30.0	
27	1308	31.1	
28	1356	32.3	
29	1405	33.4	
30	1453	34.6	2 1/2
31	1502	35.8	
32	1550	36.9	
33	1598	38.1	
34	1647	39.2	
35	1695	40.4	
36	1744	41.5	3
37	1792	42.7	
38	1841	43.8	
39	1889	45.0	
40	1938	46.1	
41	1986	47.3	
42	2034	48.4	3 1/2
43	2083	49.6	
44	2131	50.7	
45	2180	51.9	
46	2228	53.1	
47	2277	54.2	

Inch.	Gallons	Barrels	Feet
48	2325	55.4	4
49	2373	56.5	
50	2422	57.7	
51	2470	58.8	
52	2519	60.0	
53	2567	61.1	
54	2616	62.3	4 1/2
55	2664	63.4	
56	2713	64.6	
57	2761	65.7	
58	2809	66.9	
59	2858	68.0	
60	2906	69.2	5
61	2955	70.3	
62	3003	71.5	
63	3052	72.7	
64	3100	73.8	
65	3148	75.0	
66	3197	76.1	5 1/2
67	3245	77.3	
68	3294	78.4	
69	3342	79.6	
70	3391	80.7	
71	3439	81.9	
72	3488	83.0	6
73	3536	84.2	
74	3584	85.3	
75	3633	86.5	
76	3681	87.6	
77	3730	88.8	
78	3778	90.0	6 1/2
79	3827	91.1	
80	3875	92.3	
81	3923	93.4	
82	3972	94.6	
83	4020	95.7	
84	4069	96.9	7
85	4117	98.0	
86	4166	99.2	
87	4214	100.3	
88	4263	101.5	
89	4311	102.6	
90	4359	103.8	7 1/2
91	4408	104.9	
92	4456	106.1	
93	4505	107.3	
94	4553	108.4	
95	4602	109.6	

Inch.	Gallons	Barrels	Feet
96	4650	110.7	8
97	4698	111.9	
98	4747	113.0	
99	4795	114.2	
100	4844	115.3	
101	4892	116.5	
102	4941	117.6	8 1/2
103	4989	118.8	
104	5038	119.9	
105	5086	121.1	
106	5134	122.2	
107	5183	123.4	
108	5231	124.6	9
109	5280	125.7	
110	5328	126.9	
111	5377	128.0	
112	5425	129.2	
113	5473	130.3	
114	5522	131.5	9 1/2
115	5570	132.6	
116	5619	133.8	
117	5667	134.9	
118	5716	136.1	
119	5764	137.2	
120	5813	138.4	10
121	5861	139.5	
122	5909	140.7	
123	5958	141.9	
124	6006	143.0	
125	6055	144.2	
126	6103	145.3	10 1/2
127	6152	146.5	
128	6200	147.6	
144	6670	159	

Note: All values shown are approx. and are to be used as reference only.

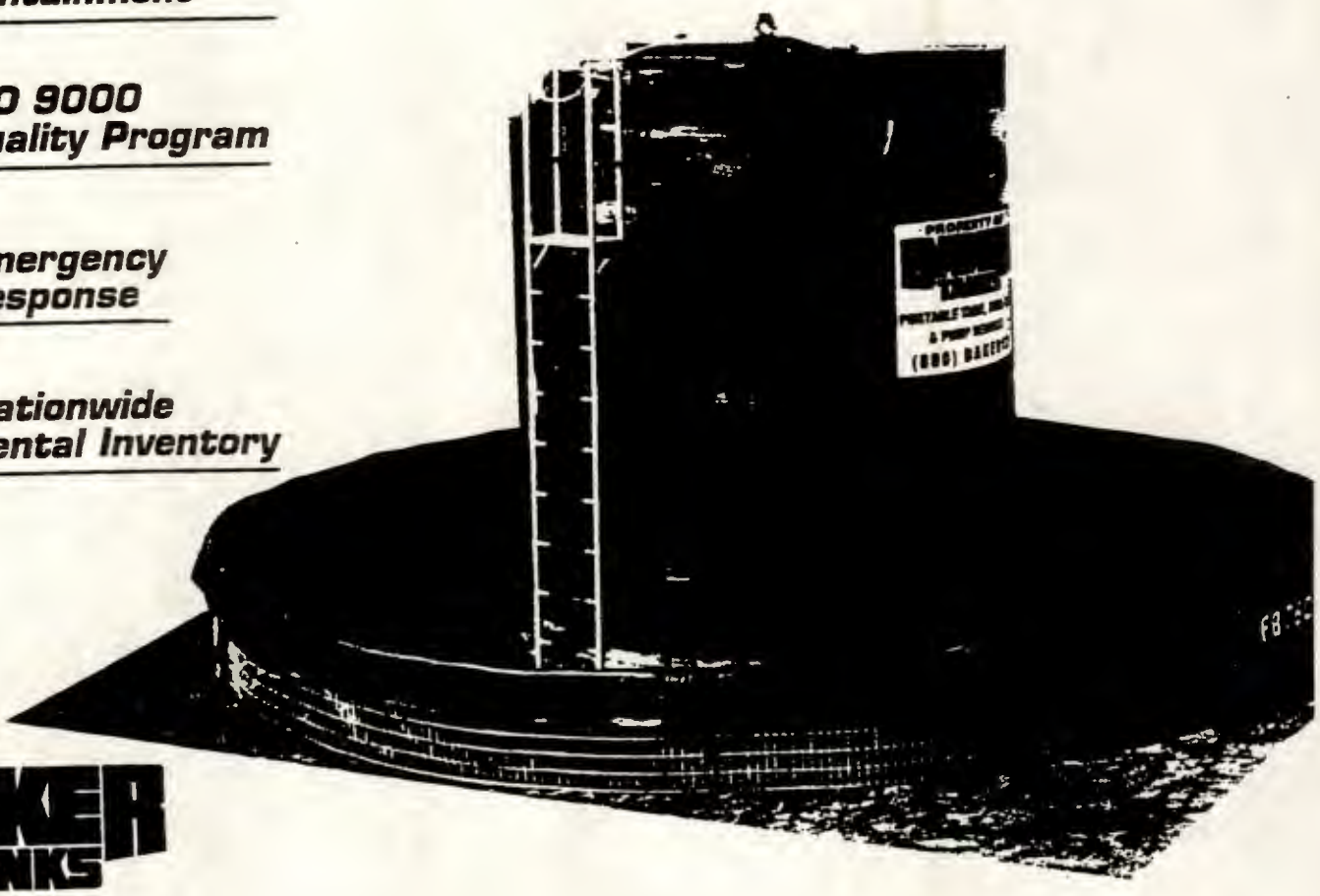
REV:4/21/99

BAKER

POLY TANKS AND EZ SET CONTAINMENT BERMS

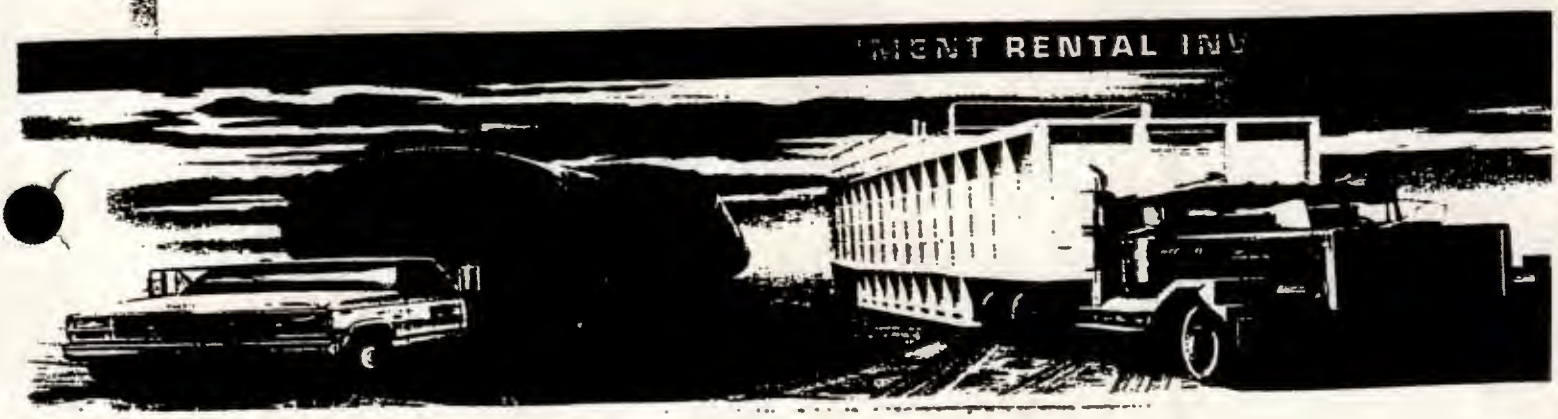
IDEAL FOR MOST ACIDS, CHEMICALS AND CAUSTICS

- ***110% Secondary Containment***
- ***ISO 9000 Quality Program***
- ***Emergency Response***
- ***Nationwide Rental Inventory***



BAKER TANKS

Your Best Rental Decision



SAFE-GUARD PORTABLE BERMS

SAFE, SECURE SPILL MANAGEMENT FOR:

- Tanks
- Pumps
- Pipe & Hose
- Tank Trailers
- Roll-Off Containers
- Drum Storage

QUALITY CONTAINMENT RENTAL SOLUTIONS

- EZ Set Berm provides spill containment
- Rigid sidewall support
- Turn-key setup/removal

MAXIMUM SAFETY AND SECURITY

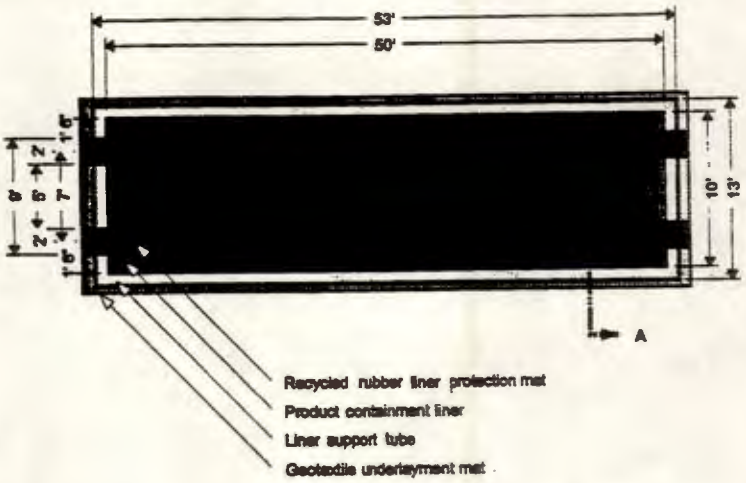
- Effectively maintains compliance goals
- PVC-coated polyester reinforced liner
- Superior weather & chemical resistance

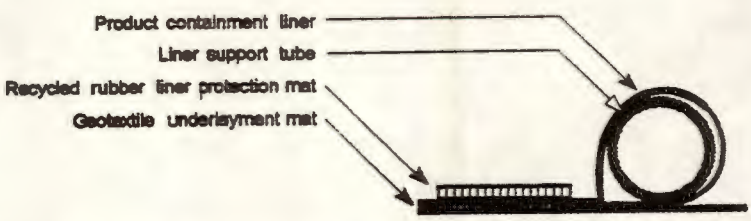
AVAILABLE BERM OPTIONS

- Three sizes stocked

  Outside dimensions:

  15' x 13', 43' x 13', 53' x 13'
- Custom orders available





1400

Why Choose Baker Rental Equipment?

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- **57 years of proven stability and reliability**
- **Professional application engineers on staff**
- **34 regional service centers nationwide**
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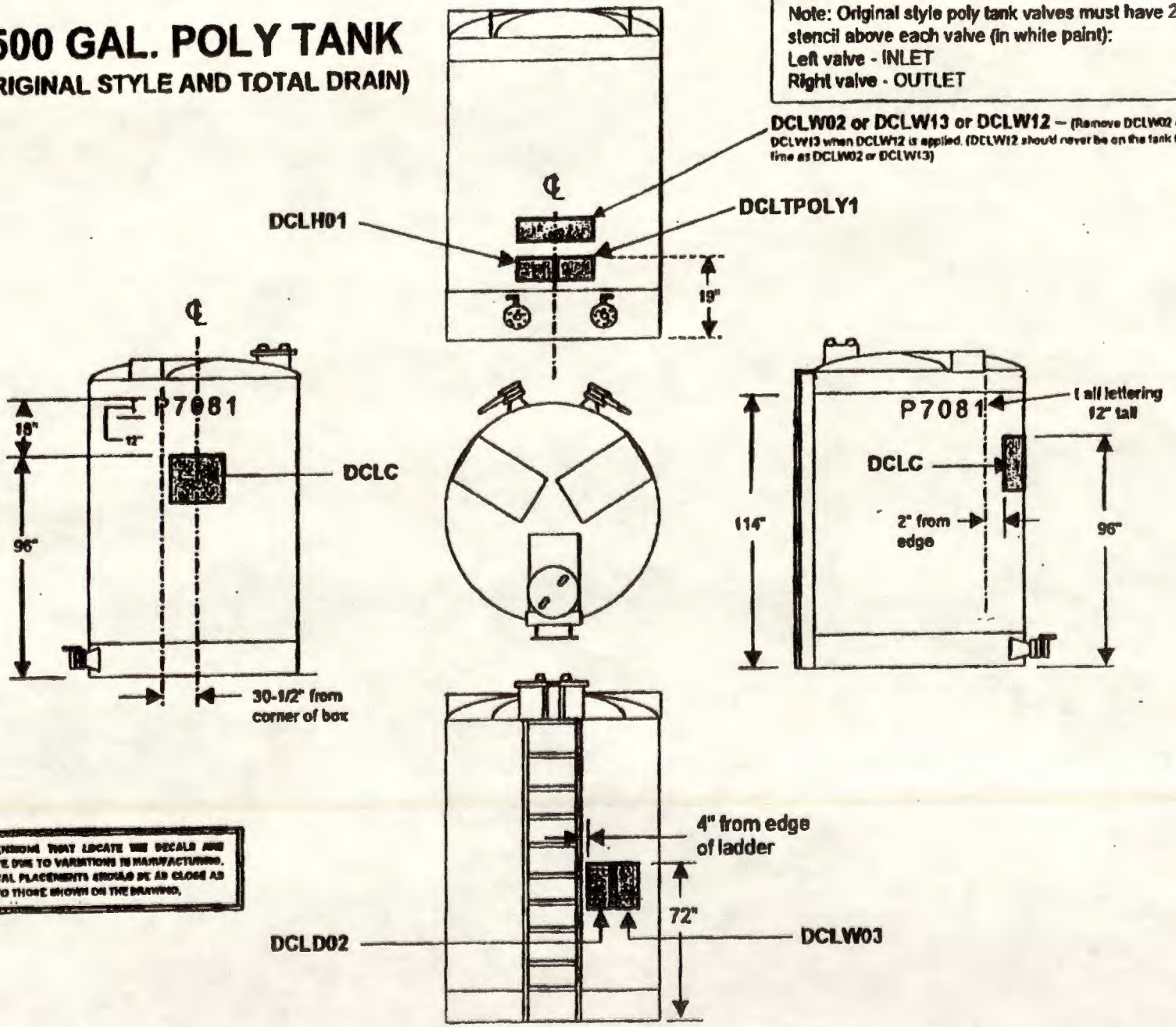
- **Quality system designed to ISO 9000 guidelines**
- **Responsive, company owned delivery fleet**
- **Service 24 hours a day, 365 days a year**

NATIONWIDE
800-BAKER 12
For immediate service at any of our 34 branch locations

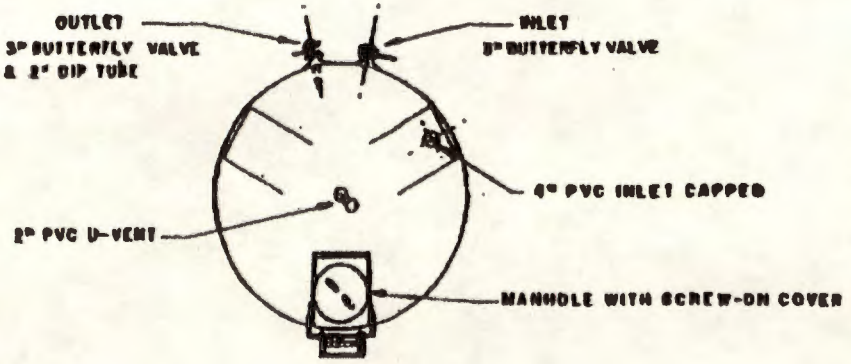
BAKER TANKS

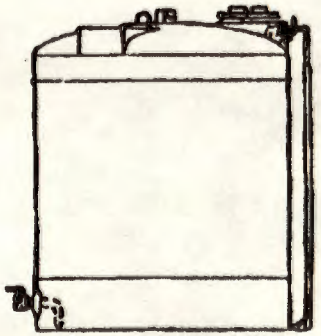
6500 GAL. POLY TANK
(ORIGINAL STYLE AND TOTAL DRAIN)

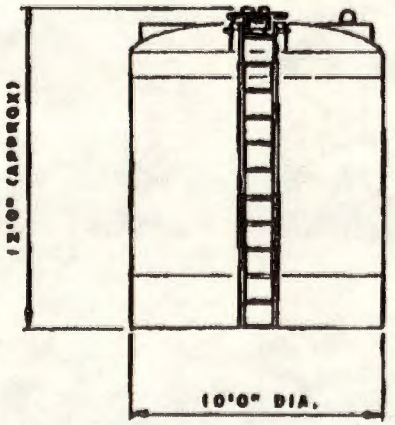
Note: Original style poly tank valves must have 2" stencil above each valve (in white paint):
Left valve - INLET
Right valve - OUTLET

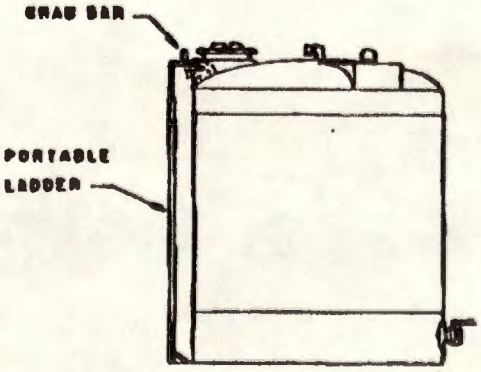


NOTE: DIMENSIONS THAT LOCATE THE DECALS ARE APPROXIMATE DUE TO VARIATIONS IN MANUFACTURING. ACTUAL DECAL PLACEMENTS SHOULD BE AS CLOSE AS PRACTICAL TO THOSE SHOWN ON THE DRAWING.

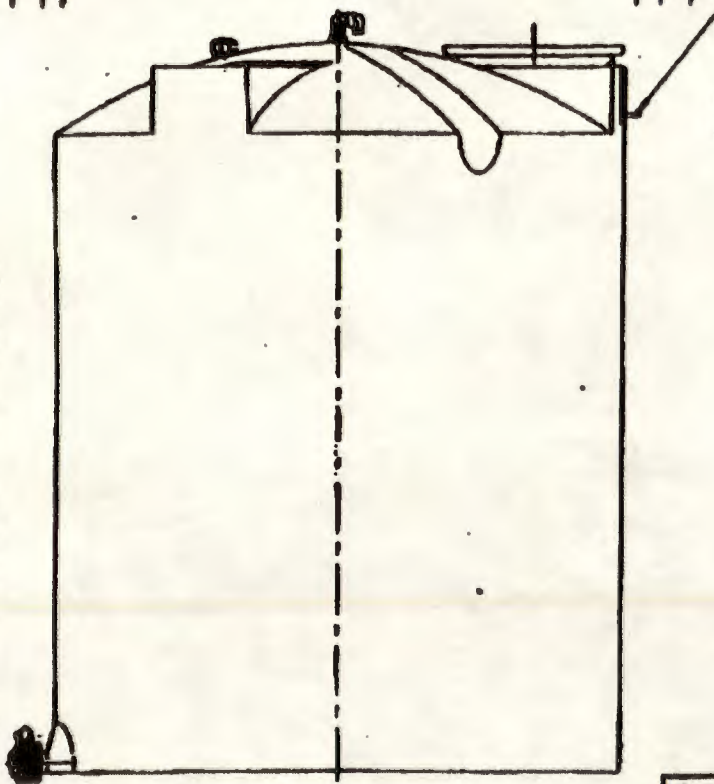


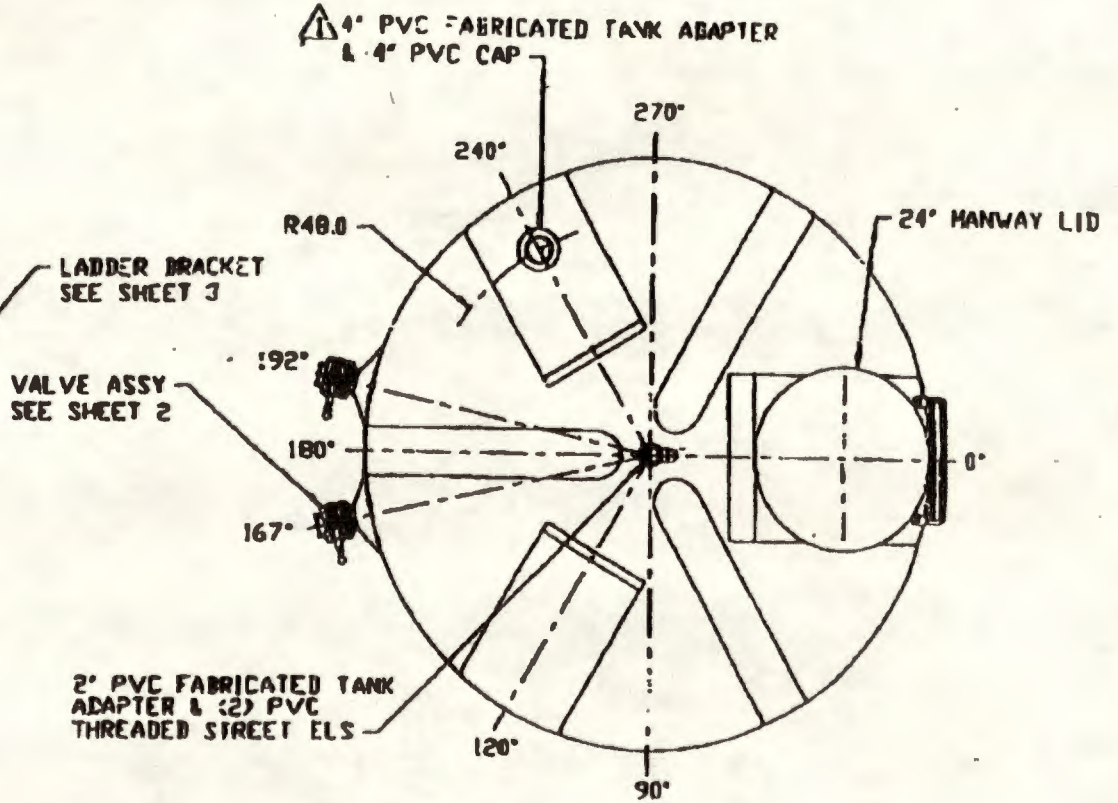






Rev.	By:	Date	Approx. Wt: 2,250 lbs (est)	BAKER TANKS
0	PJB	10/28/97	Drawn By:	
			Checked By:	6500 GALLON





VIEW A-A

Rev.	By:	Date	Approx. Weight: lbs	DAKER TANKS	19618 S. Susana Road Rancho Dominguez, CA
0	PJB	-10/8/97	Drawn By: Poly Processing		
			Checked By:		4000/6500 GAL POLY TANK FITTING INSTALLATION
			Dwg. No.		

D-4

TANK LEVEL SWITCHES

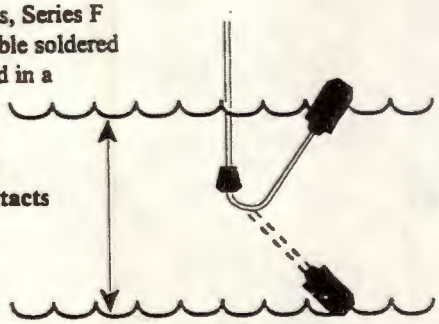
ry Tilt

FLOAT SYSTEMS

SERIES F — Mercury Tilt Float Level Switch

Designed for level and alarm control applications in difficult liquids such as sewage and slurries, Series F float switches consist of an oil-resistant cable soldered to a stainless steel mercury capsule, housed in a Polypropylene shell.

- **Epoxy potted connections and capsule**
- **Normally open or normally closed contacts**
- **Available with various cable lengths**



Switch logic shown is with float at rest position (not floating).

Model

- Series F

Applications

- Level Control
- Alarms
- Sewage Lift Systems
- Slurries
- Drainage Sumps
- Wastewater Treatment
- Holding Tanks
- Fuel Storage Tanks

Features

- Oil Resistant Cable
- Stainless Steel Mercury Capsule
- Epoxy Potted Connections
- ABS Shell
- Polyurethane Foam Filling
- Various Contact Ratings
- 1 Amp or 10 Amp, Normally Open or Normally Closed Contacts

Specifications Series F

BLACK RED	1 amp @ 240 VAC or 2 amp @ 120 VAC	0-140° F ambient	Single pole single throw (SPST) stainless steel mercury switch	#16 A.W.G. 2 conductor Type SJOW Oil resistant CPE	Impact resistant corrosion-resistant polypropylene	Polyurethane foam-filled chemical-resistant hysol epoxy
BLUE YELLOW	20 amp @ 120 VAC 10 amp @ 240 VAC					

Float Weight (without weight): - 2.5 lbs.
Part number for weight — 7762381
Part number for tie wrap — 7762360

Contact Ratings are for resistive loads.

Ordering Information Series F

ORDER BY COMPONENT NUMBER

F XXX XX X

2ND PLACE SYMBOL Contact Design:	
BLK	1 Amp Normally Open*
RED	1 Amp Normally Closed*

3RD PLACE SYMBOL Length	

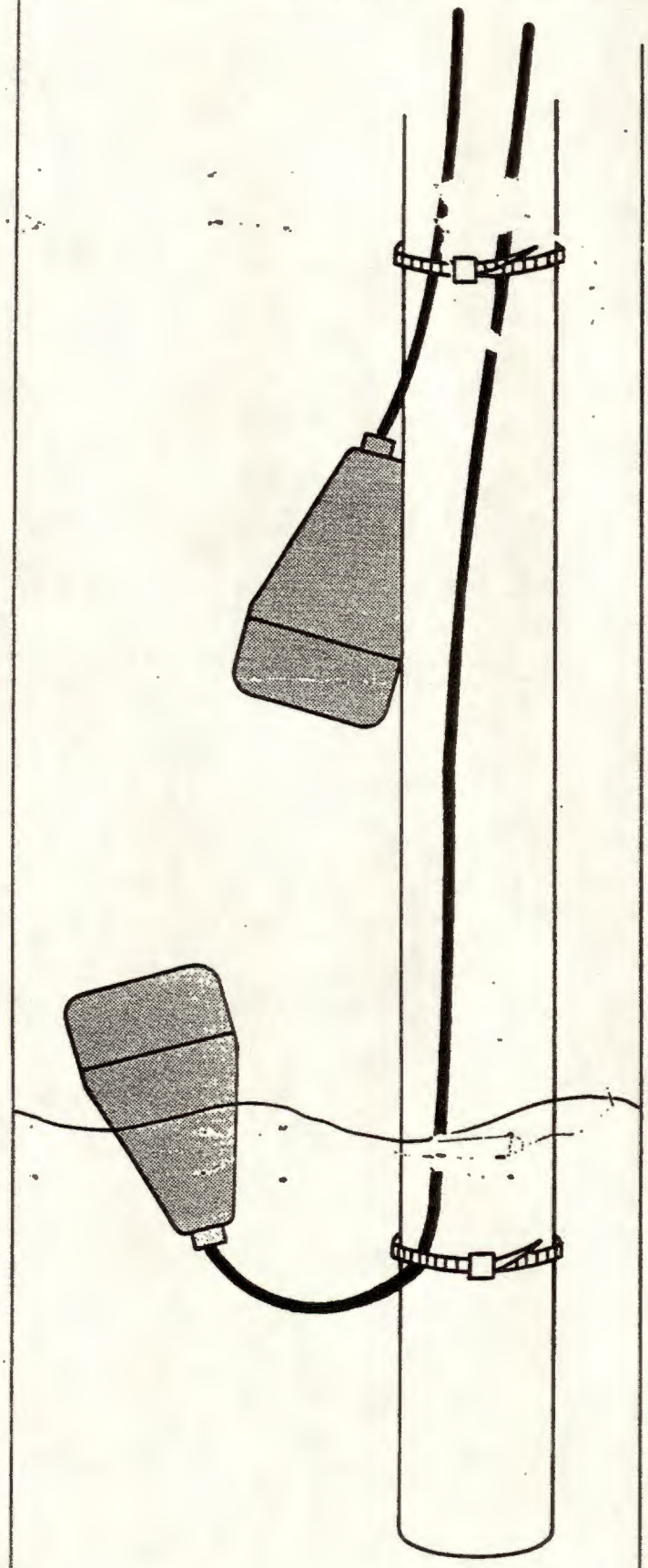
4TH PLACE SYMBOL Mounting	
T	Wire Tie
W	Weight

* In dry tank

WARRICK CONTROLS One Cowles Rd., Plainville, CT 06062-1198 • Phone: 860-793-4579 • Fax: 860-793-4580

Reviewed By marcoa 11/2/10

WARRICK CONTROLS
SERIES F
MERCURY TILT FLOAT SWITCH



Applications

Warrick's Mercury Tilt Float Switch is ideal for use in difficult liquids such as in sewage lift stations, slurries, municipal drainage sumps, waste treatment facilities, holding tanks, etc.

Reliability

Our Mercury Tilt Float Switch consists of oil resistant cable securely soldered to a stainless steel mercury capsule which is housed in a durable polypropylene outer shell. The mercury capsule and electrical connections are epoxy potted internally protecting the critical parts from moisture and vibration. The remaining inside of the float is foam filled adding strength and buoyancy under severe conditions.

Flexibility

Warrick offers the Series F for virtually any application. Whether connected to an intrinsically safe control or directly to a pump motor starter, Series F Mercury Tilt Float Switches can be used for level control as well as alarms. Models are available in either normally open or normally closed contacts, with various contact ratings, and cable lengths.

For further information, contact your Warrick Controls representative.

NOTE: If application requires an intrinsically safe circuit, request Bulletin 271.

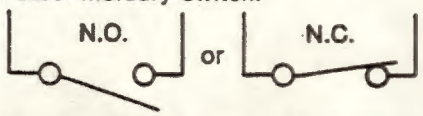
WARRICK CONTROLS

Specifications

Contact Rating*: Models F-BLK-XX-X and F-RED-XX-X, 1 AMP @ 240 VAC or 2 AMP @ 120 VAC. Models F-BLU-XX-X and F-YEL-XX-X, 1/3 HP @ 120 VAC, 20 AMP @ 120 VAC and 10 AMP @ 240 VAC.

Temperature- 0-140° F Ambient

Switch Design- Single pole single throw stainless steel mercury switch.



Cable Type: #16 A.W.G., 2 conductor type SJTO, oil resistant PVC.

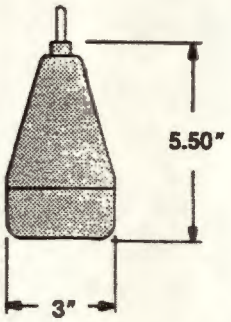
Outer Shell: Impact resistant and corrosion resistant polypropylene.

Internal: Polyurethane foam filled. Chemical resistant hysol epoxy

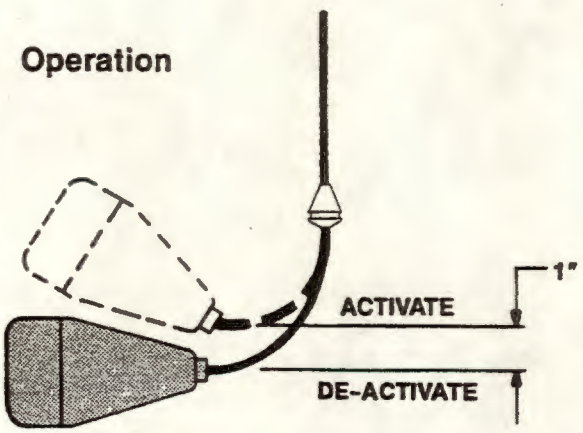
Overall Weight: (without weight) - 2.5 lbs.

*Contact ratings are for resistive loads.

Dimensions

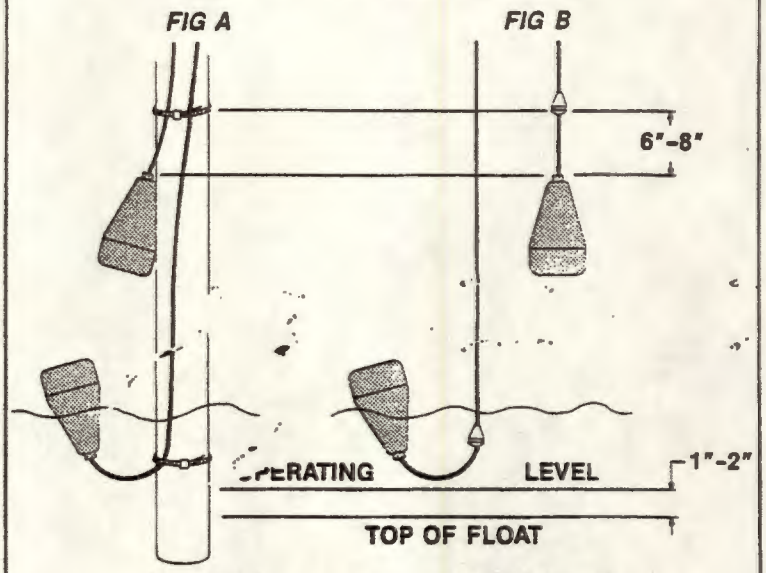


Operation



WARRICK CONTROLS, INC.
4237 Normandy Court
Royal Oak, MI 48073
Telephone: 810/549-4900
FAX: 810/549-4904

Installation of Warrick Series F Mercury Tilt Float Switch



Tie Mount (Fig A)

1) To install float using support pipe, locate top of float 1 - 2 inches below desired operating level.
2) Attach float cable to pipe 6 - 8 inches above top of float using enclosed wire tie. Be sure the serrations on the tie are on the inside.

Weight Mount (Fig B)

1) Place tension-band over the cord before installation. Place the weight at the desired position and secure with the tension-band.
2) Hang float from above with top of float 1 - 2 inches below desired operating level.

How To Order

Series F -XXX-XX- X

Mounting

T	Wire Tie
W	Weight

Length

20	20 Feet
40	40 Feet

Contact Design

BLK	1 AMP Normally Open
RED	1 AMP Normally Closed
BLU	10 AMP Normally Open
YEL	10 AMP Normally Closed

Warrick Mercury Tilt Float Switch

When level control is absolutely essential.

D-5

CARBON VENTSORB CANISTERS

CALGON

CALGON CARBON CORPORATION

EQUIPMENT BULLETIN

VENTSORB-PE

GENERAL DESCRIPTION

VentSorb-PE canisters – each containing 170 pounds of activated carbon – are ideal for low-flow air purification applications at industrial and municipal facilities. These economical adsorption systems control small volume organic contaminant and/or odorous gas emissions from:

- Storage tank vents
- Reactor vents
- API separator vents
- Sludge thickener tanks at waste treatment plants
- Sewer gas vents, wet stations and weir boxes at chemical and municipal waste treatment plants
- Chemical plant wastewater holding tanks
- Laboratory hood exhausts
- Landfills
- Airstripper and scrubber off-gases

The 55-gallon VentSorb-PE canisters contain all the elements found in a full-scale adsorption system-vessel; activated carbon, inlet connection and distributor, and an outlet connection for the purified air stream. The unique air distribution system specifically developed for this product accomplishes near plug flow characteristics, which results in ultimate carbon utilization.

FEATURES AND BENEFITS

VentSorb canisters offer industrial and municipal users several important features and benefits, including:

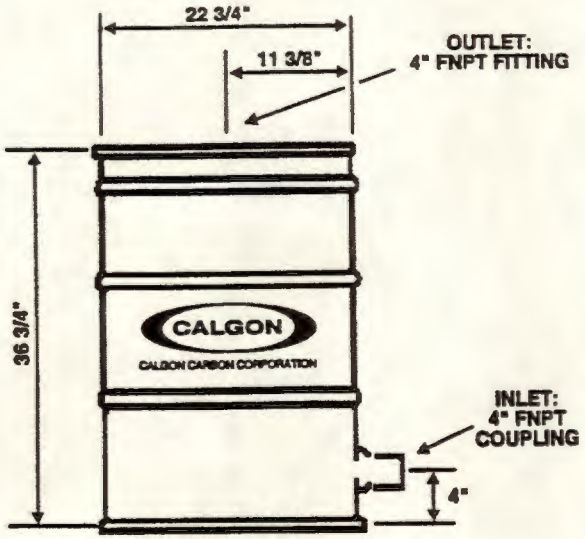
- Effective treatment to remove a variety of vapor phase organic contaminants and odor-causing compounds.
- Continuous treatment at varying flow rates and concentrations.
- Simple installation and operation.
- Flexibility to be installed in series or multiple units in parallel.
- Supplied with the type of activated carbon selected specifically for the application.
- Practical disposal option, as pre-approved spent carbon canisters may be returned to Calgon Carbon for safe carbon reactivation.
- Low cost per unit makes carbon treatment economical.
- Plug flow characteristics achieve maximum carbon utilization where other distribution systems only achieve partial utilization
- Reduces risk of carbon exotherms by eliminating dead air space

VENTSORB-PE SPECIFICATIONS

Vessel:	Open top 55 gallon plastic drum
Material:	Minimum 125 mil thick HMW-high density Polyethylene
Cover:	175 mil thick HMW-HDPE, with 16 gauge bolt ring and polyurethane gasket
Inlet:	4" FNPT Polyethylene coupling
Distributor:	Polyethylene grid and screen
Outlet:	4" FNPT Polyethylene coupling
Temperature: (operating maximum)	150°F
Flow: (recommended maximum)	200 cfm
Carbon:	170 pounds BPL 4x10 based on a 30 lbs/ft³ carbon density
Ship Weight:	210 pounds (est.)
Safety Seals:	4" threaded plugs with seal
Pressure:	± 2 PSI max

CALGON CARBON CORPORATION • P.O. BOX 717 • PITTSBURGH, PA 15230-0717 • PHONE 1-800-4CARBON

Revised 04 March 11/95



VENTSORB-PE DIMENSIONS

TYPICAL VENTSORB APPLICATIONS

Chemical, petrochemical, food, pulp and paper, and many other industrial plants – along with municipal sewage treatment facilities – are frequent users of VentSorbs for continuous control of vented emissions. Here are a few examples of user applications:

Storage Tank Vents – VentSorbs are widely used to control evaporative losses vented from storage tanks. Typically, these vapors are emitted during tank filling and emptying. In one application, a glycerin manufacturer is using the canisters to purify ambient air drawn into storage tanks during product transfer. The adsorption process helps prevent contamination of the company's glycerin product. The VentSorb units provide over six months of service for this application.

Reactor Vents – A pesticide manufacturer is using multiple VentSorbs on five reactor vessels to control trace amounts of odorous methylamine and diethylamine (which are byproducts of a caustic scrubbing process). Each VentSorb unit handles a 30 cfm air stream containing 15 ppm of amine vapors. The units provide over three months of service for this application.

API Separator Vents – A major refinery is using VentSorb units to control odorous emissions from settling basins where oil is separated from wastewater that is discharged in condensate, blowdown or drain systems. For this application, API separators are covered and vented to comply with local air pollution control regulations. The air stream is pulled through two VentSorb units, operating in parallel configuration, at 100 cfm.

VENTSORB-PE INSTALLATION

VentSorb-PE canisters are shipped ready for installation. Each canister is self-supporting and should be placed on a level, accessible area as near as possible to the emission source. Installation is simple, requiring just a flexible hose or pipe to connect the vent to the 4-inch FNPT bottom inlet of the canister.

If the VentSorb-PE will be vented directly to outside air, a U-shaped outlet pipe or rain hat – such as a pipe tee – is recommended to prevent precipitation from entering the unit.

VentSorb-PE canisters operate from a continuous suction across the vent. The suction can be produced by a blower or by using the positive pressure inside the tank or process vessel. In many cases, the pressure or surge of pressure within the tank or vessel is sufficient to overcome the pressure drop across the canister – thus eliminating the need for a blower. Please consult pressure drop data in this bulletin for more information.

Maximum recommended air flow through a VentSorb-PE is 200 cfm. If higher flows are encountered, plant operators should install two or more canisters in parallel configuration.

When VentSorb-PE canisters are used to control vapors from organic solvent storage tanks, the following precautions are recommended:

- A safety relief valve must be provided. This protects the storage tank should the VentSorb-PE become plugged or blocked in any fashion. Such a vent would open in this emergency situation, thereby relieving pressure.
- Under appropriate conditions, a flame arrestor and/or backflow preventer must be installed as shown in this bulletin's storage tank installation drawing. This prevents backflow of air through the VentSorb when the storage tank is empty.
- Pre-wetting the carbon helps dissipate excessive heat that may be caused by high organic compound concentration (>0.5 to 1.0 Vol. %).

Also, if VentSorb canisters are used to control organic emissions from airstrippers or other high moisture content air streams, Calgon Carbon recommends that humidity in the air stream be reduced to under 50 percent. Lower humidity optimizes adsorptive capacity of the carbon. In addition, for similar applications that generate a condensate, Calgon Carbon recommends installation of a drain on the inlet piping.

RETURN OF VENTSORB-PE

Arrangements should be made at the time of purchase regarding the future return of canisters containing spent carbon. Calgon Carbon will provide instructions on how to sample the spent carbon and arrange for carbon acceptance testing. The spent carbon is reactivated by Calgon Carbon and all of the contaminants are thermally destroyed.

No VentSorbs can be returned to Calgon Carbon unless the carbon acceptance procedure has been completed, an acceptance number provided, and the return labels (included with the units at the time of purchase) are attached.

VentSorb-PE must be drained – and inlet/outlet connections must be plugged – prior to return to Calgon Carbon.

VENTSORB CARBON LIFE ESTIMATE

This table lists the theoretical adsorption capacities for several compounds. The adsorption capacity for nonpolar organics increases with the boiling point, molecular weight and concentration of the air contaminant. Estimate the life of a VentSorb canister for other organic compounds by matching them with compounds of similar boiling point and molecular weight in this table. Low molecular weight (less than 50) and/or highly polar compounds such as formaldehyde, methane, ethanol, etc., will not be readily adsorbed at low concentrations.

Note: The standard VentSorb-PE canister contains 170 pounds of BPL carbon.

THEORETICAL VENTSORB CAPACITIES

	BOILING POINT/°C	MOLECULAR WEIGHT	Theoretical VentSorb Capacity Lb Adsorbed/VentSorb* 10 PPM	100 PPM	1,000 PPM
Acrylonitrile	77.3	53.1	7.7	15.3	31.5
Benzene	80.1	78.1	23.0	33.2	46.8
n-Butane	-0.5	58.1	4.3	7.7	14.5
Carbon Tetrachloride	76.8	153.8	39.1	56.1	82.5
Dichloroethylene	37.0	97.0	13.6	24.7	45.0
Methylene Chloride	40.2	84.9	5.1	11.0	25.5
Freon 115	-37.7	154.5	5.1	9.4	17.9
n-Hexane	68.7	86.2	19.6	26.4	36.6
Styrene	145.2	104.1	47.6	57.8	69.7
Toluene	110.6	92.1	37.4	47.6	59.5
Trichloroethylene	87.2	131.4	38.3	55.3	80.8

* Theoretical capacity based on 70 degrees F., atmospheric pressure, less than 50 percent humidity and 170 pounds of carbon using isotherm data for Type BPL carbon.

VENTSORB-PE SAFETY CONSIDERATIONS

While complying with recommended installation instructions, plant operators should also be aware of these additional heat-related safety considerations:

1. When contacting with activated carbon, some types of chemical compounds – such as those from the ketone and aldehyde families and some organic acids or organic sulfur compounds – may react on the carbon surface causing severe exotherms or temperature excursions. **If you are unaware or unsure of the reaction of an organic compound on activated carbon, appropriate tests should be performed before putting a VentSorb-PE in service.**

2. Heat of adsorption can lead to severe temperature excursions at high concentrations of organic compounds. Heating may be controlled by diluting the inlet air, time weighting the inlet concentration to allow heat to dissipate, or pre-wetting the carbon.

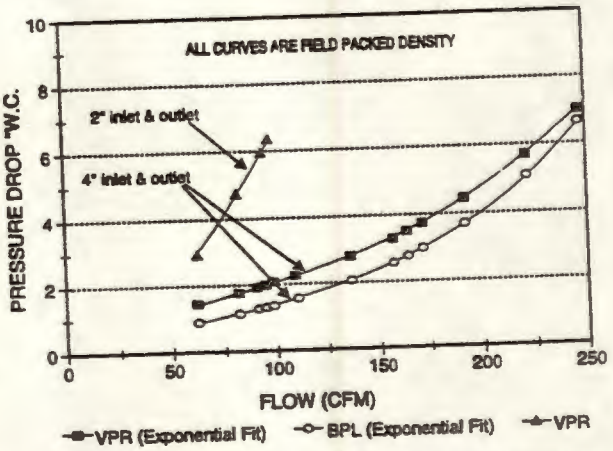
3. **Do not use VentSorb-PE with Type IVP carbon in petro- chemical or chemical industry applications.**

4. Type IVP carbon can liberate heat by reacting chemically with oxygen. To prevent heat within a vessel, the carbon must not be confined without adequate air flow to dissipate the heat. In situations where there is insufficient or disrupted air flow through the vessel, the chemical reaction can be prevented by sealing the inlet and outlet connections to the vessel.

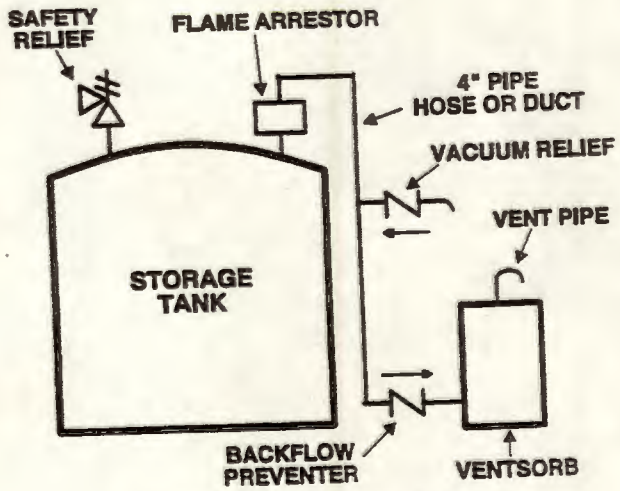
NOTE: CONTACT YOUR LOCAL CALGON CARBON TECHNICAL SALES REPRESENTATIVE FOR CLARIFICATION OR TO ANSWER ANY QUESTIONS.

CALGON CARBON AIR PURIFICATION SYSTEMS

VentSorb-PE is a unit specifically designed for a variety of small applications. Calgon Carbon Corporation offers a wide range of carbon adsorption systems and services for a greater range of flow rates and carbon usages to meet specific applications.



Pressure drop through a VentSorb unit is a function of the process air flow as shown in the graph. A VentSorb canister can handle up to 200 cfm at a pressure drop of less than 5 inches water column. If higher flows or lower pressure drop is needed, multiple canisters may be installed in parallel operation. The maximum canister pressure should not exceed 2 psig.



Typical VentSorb Installation at Storage Tank

LIMITATION OF LIABILITY

The Purchaser's exclusive remedy for any cause of action arising out of purchase and use of the VentSorb-PE, including but not limited to breach of warranty, negligence and/or indemnification, is expressly limited to a maximum of the purchase price of the VentSorb unit as sold. All claims of whatsoever nature shall be deemed waived unless made in writing within forty-five (45) days of the occurrence giving rise to the claim. In no event shall Calgon Carbon Corporation for any reason be liable for incidental or consequential damages, damages in excess of the purchase price of the VentSorb-PE unit, loss of profits or fines imposed by Governmental agencies.

WARRANTY

There are no expressed or implied warranties – or any warranty of merchantability or fitness – for a particular purpose associated with the sale of this product.

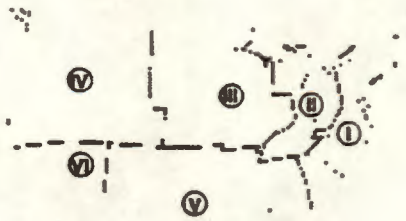
Application information provided in this bulletin is based upon theoretical data. Calgon Carbon Corporation assumes no responsibility for the use of the information in this product bulletin.

For detailed information on the products described in this bulletin, please contact one of our Regional Sales Offices located nearest to you:

SALES OFFICES

Region I
Bridgewater, NJ
Tel (908) 526-4646
Fax (908) 526-2467

Region II
Pittsburgh, PA
Tel (412) 787-6700
800/4-CARBON
Fax (412) 787-6676



Region IV
San Mateo, CA
Tel (415) 572-9111
Fax (415) 574-4466

Region V
Houston, TX
Tel (713) 690-2000
Fax (713) 690-7909

Region III
Lisle, IL
Tel (708) 505-1919
Fax (708) 505-1936

Latin America/ Asia Pacific
Pittsburgh, PA
Tel (412) 787-4519
Fax (412) 787-4523

Canada
Calgon Carbon Canada, Inc.
Mississauga, Ontario
Tel (905) 673-7137
Fax (905) 673-8883

Europe
Chemviron Carbon
Brussels, Belgium
Tel 32 2 773 02 11
Fax 32 2 770 93 94

Region VI
Carlsbad, CA
Tel (619) 431-5550
Fax (619) 431-8169

If at any time our products or services do not meet your requirements or expectations, or if you would like to suggest any ideas for improvement, please call us at 1-800-548-1999.

CALGON

CALGON CARBON CORPORATION

CALGON

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PRODUCT BULLETIN

CENTAUR® HSV

GRANULAR ACTIVATED CARBON

DESCRIPTION

CENTAUR® HSV* is a vapor phase virgin activated carbon that has been developed specifically for odor removal from sewage treatment operations. This bituminous coal-based product is unique in that it provides high adsorption capacity for H_2S without chemical impregnants and adsorbs volatile organic compounds (VOCs) in an effective manner. CENTAUR HSV, by its catalytic functionality, oxidizes H_2S and converts it to water soluble sulfur compounds. As a result, H_2S capacity can be restored simply by water washing the carbon, eliminating safety concerns typically encountered with alkali impregnated carbons. CENTAUR HSV is capable of being thermally reactivated which eliminates the disposal concerns associated with alkali impregnated carbons.

APPLICATIONS

CENTAUR HSV can be utilized for odor removal in sewage treatment applications. The product is ideal for use at pump stations and treatment plants where H_2S and organic odors are a problem. On-site water regeneration and eventual thermal reactivation minimize operating and disposal costs.

REGENERATION

When odor breakthrough due to H_2S occurs, the spent carbon can be regenerated in place. The H_2S capacity can be restored by water washing of the CENTAUR HSV carbon. Regeneration efficiency and the number of regeneration cycles depend on the loadings of H_2S and VOCs. For details on regeneration and cycle determination, please contact Calgon Carbon Corporation in Pittsburgh, Pennsylvania.

DESIGN CONSIDERATIONS

Effective removal of H_2S requires the gas stream to contain at least an equivalent amount of oxygen and relative humidity above 10%. Condensation of water on the carbon will reduce its performance, and devices to prevent free condensation are recommended. Additionally, if CENTAUR HSV is used to control VOCs it is recommended that the relative humidity be controlled to below 50% to maximize carbon utilization.

CENTAUR HSV can be utilized in a typical fixed bed mode with superficial velocities up to 100 fpm. The bed depth can range from 12" to 36" depending on the on-stream time and water wash frequency desired. For assistance in the design of a carbon system, please contact Calgon Carbon Corporation in Pittsburgh, Pennsylvania.

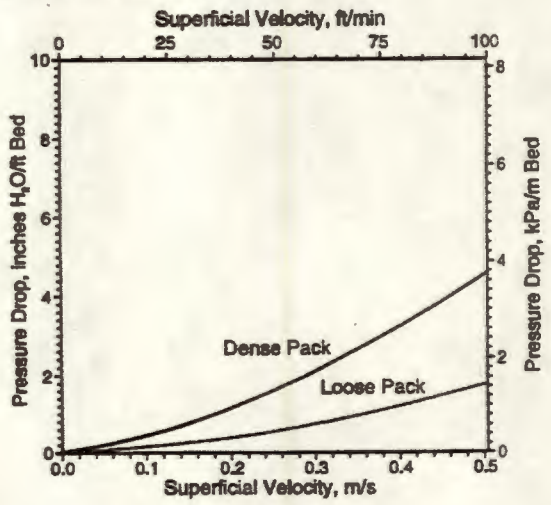
*Purchase of this product from Calgon Carbon Corporation includes a license under the following U.S. Patents. Numbers 5356849 and 5494869

PROPERTIES

H_2S Capacity, g H_2S/cc carbon*:	0.09 min
Butane Activity, weight %:	15.6 min
Iodine No, mg/g:	800 min
Ash, weight %:	7 max
Moisture, weight %, as packed:	4 max
Apparent Density, g/cc:	0.56 min
Hardness No:	97 min
Mean Particle Diameter:	3.7 mm
U.S. Sieve Series:	
Percent on 4 mesh	15 max
Percent through 7 mesh	8 max

*As determined by Calgon Carbon Corporation test TM-41 in which a moist air stream containing 1% H_2S (total flow rate of 1,450 cc/min) is passed through a 1.0 inch diameter, 9 inch long column of activated carbon and monitored to 50 ppm H_2S breakthrough.

PRESSURE DROP CURVE



MANUFACTURING

Catlettsburg, KY

PACKAGING

225 lb (102.3 kg) fiber drum

LC-760-05/98

FEATURES	BENEFITS
• Not chemically impregnated	• Heat excursion potential caused by impregnants is eliminated thus making operations safer.
	• Organic capacity is significantly higher than impregnated carbons thus reducing operating costs.
• Metallurgical grade high purity coal	• Extreme hardness and abrasion resistance which reduces carbon attrition problems and pressure drop increase over time.
• Catalytic Activity	• Since multiple water washes are possible, Centaur HSV is capable of treating higher H_2S concentrations typically handled by chemical wet scrubbers.
• Pore volume not consumed by impregnant	• In contrast to impregnated carbons, Centaur HSV has organic capacity equal to or higher than other virgin coal based carbons.
• Enhanced adsorption pore volume	• Centaur HSV has been specifically designed to show enhanced organic capacity at low contaminant concentrations typically found in sewage treatment plants.
• Ability to be water washed	• In H_2S service, Centaur HSV can be field regenerated by water washing multiple times, thus eliminating safety concerns experienced with alkali regeneration and chemical handling.
• Ability to be thermally reactivated	• Centaur HSV can be thermally reactivated, thus spent carbon disposal problems are eliminated.

SAFETY MESSAGE

Wet activated carbon preferentially removes oxygen from air. In closed or partially closed containers and vessels, oxygen depletion may reach hazardous levels. If workers are to enter a vessel containing carbon, appropriate sampling and work procedures for potentially low oxygen spaces should be followed, including all applicable federal and state requirements.

Local Representative:

Calgon Carbon Corporation's activated carbon products are continuously being improved and changes may have taken place since this publication went to press.

CALGON

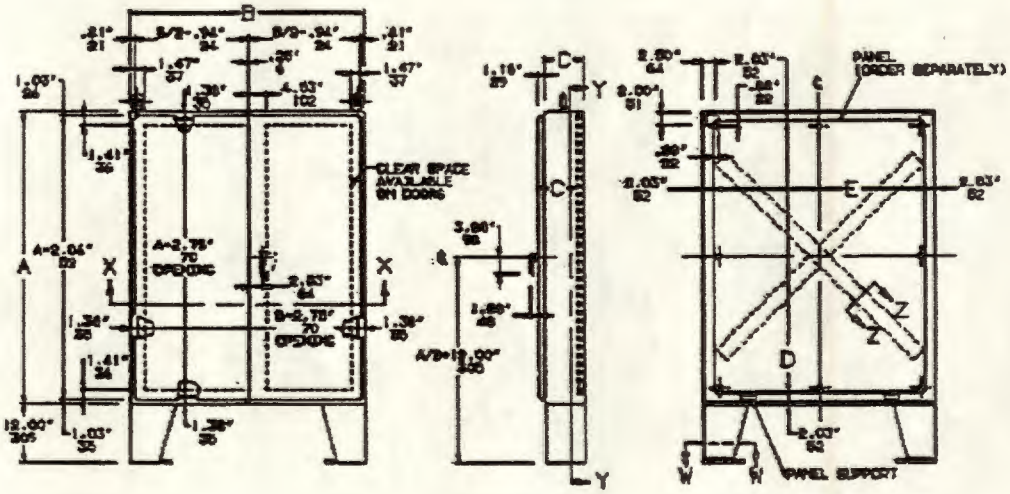
CALGON CARBON CORPORATION

D-6

ELECTRICAL ENCLOSURE

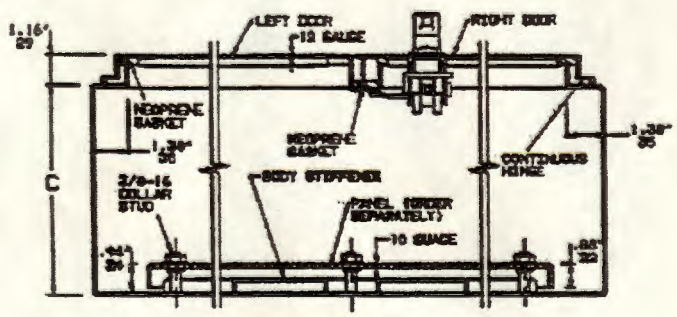
Corrosion-Resistant Enclosures, Stainless Steel, Floor-Mount, Two-Door Type 12 E

Close

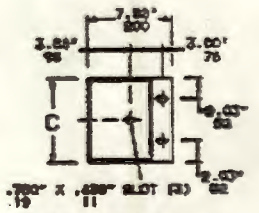


SECTION Y-Y

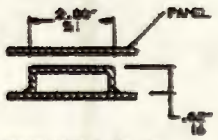
NOTE: Right Door has removable 12.00 x 12.00 (305 x 305) data pocket.



SECTION X-X
(LIFTING ANGLES NOT SHOWN)



SECTION W-W



SECTION Z-Z

Inch
Millimeter

Show All

Printed By marcia 11/28/00

Catalog Number	Size	Height A (inch)	Height A (mm)	Width B (inch)	Width B (mm)	Depth C (inch)	Depth C (mm)	Gauge	Panel Catalog Number	Panel Gauge	Panel Size D x E (inch)	Panel Size D x E (mm)	Stiffene (Door)
A-604824SSLP	60.06 x 48.06 x 24.06 (1526 x	60.060001	1526.0	48.060001	1221.0	24.059999	611.0	12	A-60P48	10	56.00 x 44.00	1422 x 1118	0

Accessories

Door Stop Kit
Drip Shield Kit
Electrical Interlocks
Enclosure Stabilizers
Folding Shelf
Lighting Kit
Panel Support Kit
Panels (See table)
Window Kit
Wiring Duct

Application

Designed to house systems incorporating large components or complex mounting configurations. Three-point latc sealing provide industry-leading protection from dust, dirt, oil, and water.

Construction

- 12 or 14 gauge Type 304 stainless steel
- Seams continuously welded and ground smooth, no holes or knockouts
- Strong, rigid construction with body stiffeners
- Gasketed overlapping doors eliminate need for center post
- Plated steel 3-point latching mechanism and key-locking handle
- Latch rods have rollers for easier door-closing
- Heavy gauge continuous hinges support each door
- Data pocket, provided on door with 3-point latches, is high-impact thermoplastic
- 12-inch floor stands are welded to enclosure
- Heavy duty lifting eyes
- Panel supports
- Oil-resistant gasket attached with oil-resistant adhesive and held in place with steel retaining clips
- Collar studs for mounting optional panel

Finish

Enclosures are unpainted. Front, sides, top, and back have smooth brushed finished. Chrome plated lifting eyes. are white.

Standards

UL 508 Type 4, Type 4X, and Type 12
NEMA/EEMAC Type 12
JIC standard EGP-1-1967
CSA Type 12
IEC 529, IP65
UL File Number E61997
CSA File Number LR42186

Close

Hoffman
A Pentair Company

iHELPS On-Line Catalog System — PRODUCT DISPLAY

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Sales Channel Tools

Price List

Corrosion-Resistant Enclosures, Stainless Steel, Floor-Mount, Two-Door Type 12 Enclosures

See Legend Below

- Accessories
- Application
- Construction
- Finish
- Standards

Show All

Catalog No.	UPC/EDP No.	Bulletin	Description	Material	Footnotes	Weight	U.S. List Price
A-604824SSLP	84250	A12S	1	Stainless Steel Type 304	1, 2, 4	430.00	$7,427.00

1. Millimeter dimensions () are for reference only; do not convert metric dimensions to inch.
2. Standard product available for shipment within 10 working days.
3. Rolled lip around door opening.
4. Panels must be ordered separately.

Accessories
Door Stop Kit
Drip Shield Kit
Electrical Interlocks
Enclosure Stabilizers
Folding Shelf
Lighting Kit
Panel Support Kit
Panels (See table)
Window Kit
Wiring Duct

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- Collar studs for mounting optional panel

Finish
Enclosures are unpainted. Front, sides, top, and back have smooth brushed finished. Chrome plated lifting eyes. Steel panels are white.

Standards
UL 508 Type 4, Type 4X, and Type 12
NEMA/EEMAC Type 12
JIC standard EGP-1-1967
CSA Type 12
IEC 529, IP65
UL File Number E61997
CSA File Number LR42186

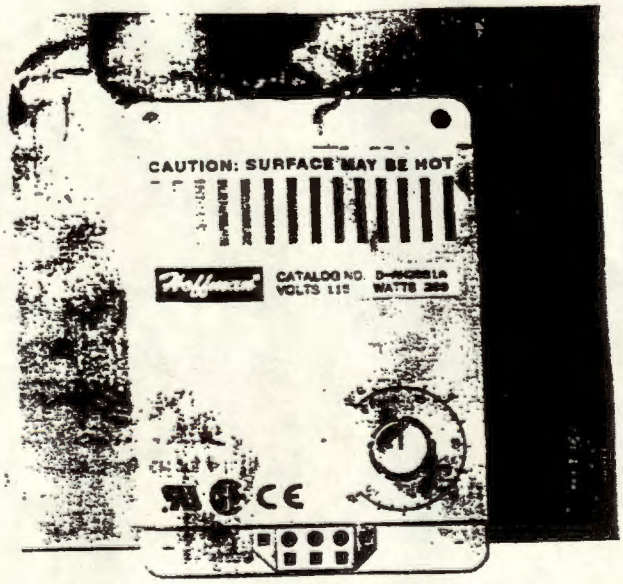
Legend

- Dimensional Drawings
- Matching Components
- Add To Bill Of Materials

Hoffman

A Pentair Company

Electric Heater
Elektrisches Heizgerät
Réchauffeur élétrique



28359001

English

INTRODUCTION

1. Before installing the electric heater, read these instructions carefully. Failure to follow these instructions could damage the product or cause a hazardous condition.

2. Check the ratings on the heater label to assure the product is suitable for your application.

To avoid electric shock and equipment damage, disconnect any power supplies to the enclosure before installing the electric heater.

GENERAL SAFETY INFORMATION

1. Protect the lead wires from coming [illegible] sharp objects, hot surfaces, and/or chemicals.

2. If continuous operation of the heater is essential to the safe functioning of any other equipment, adequate warning devices must be installed to assure safe operation at all times.

These electric heaters are not designed for use in dusty, dirty, or hazardous locations.

Portions of the heater can get hot. Adequate protection must be taken to protect people from potential burns, and to protect other components from this heat.

This heater can only be installed in a totally enclosed metal enclosure.

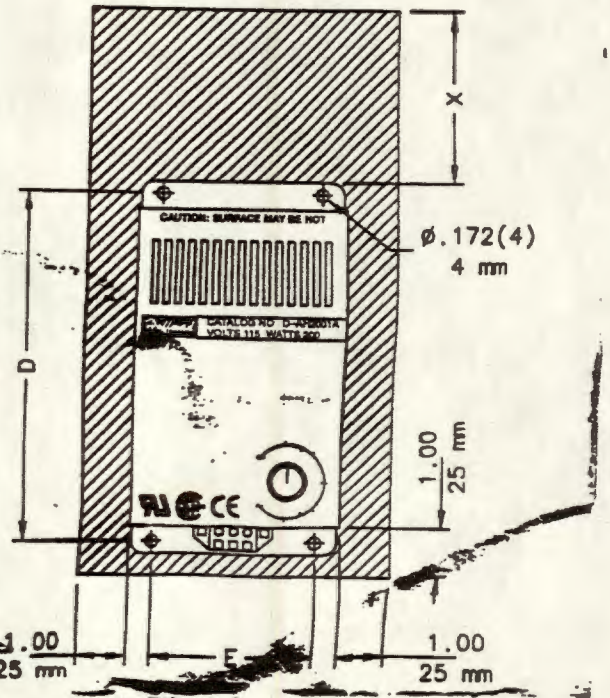
English

LOCATION AND MOUNTING

1. Hoffman electric heaters should be centered as low as possible in the enclosure for optimum heat distribution.

2. It is recommended that the heater be installed on a panel for optimum performance. It may, however, be mounted on any metal surface.

3. For maximum efficiency, the heater should be mounted in a vertical position with the terminal block at the bottom and the air outlet openings at the top as shown. Also the unit will effectively distribute heat if turned 90° with the terminal block towards the side.



4. Heaters should not be installed on wood or other combustible surfaces.

5. Heat sensitive components should not be placed near the heater discharge area.

6. The recommended clearances shown indicate the space that should be kept free of components for safe operation of the heater.

7. Four 10–32 UNF, self–tapping screws are included for installation.

CATALOG NUMBER	D	E	X
D–AH1001AD–AH1002A D–AH2001AD–AH2002A	5.00	3.25	4.00
D–AH4001BD–AH4002B D–AH8001BD–AH80002B	7.00	3.50	6.00

English

WIRING (Reference Page 11)

1. All wiring must comply with applicable local codes and ordinances.
2. Connect the heater leadwires to the proper A.C. power source.
3. The heater must be properly grounded.

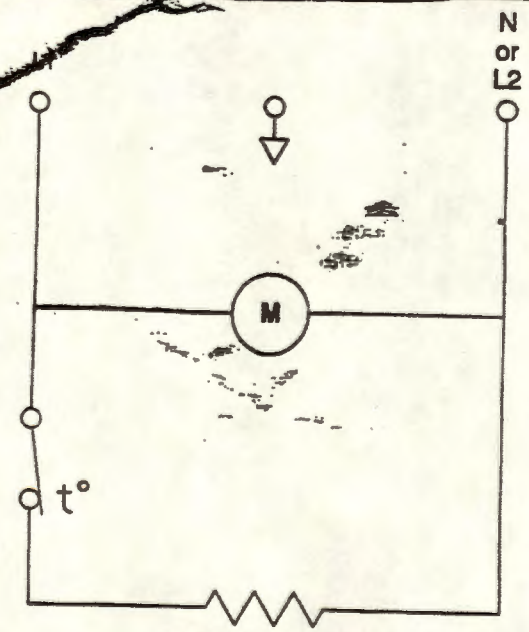
NOTE: Exposed wires should not come in contact with the heater housing.

MAINTENANCE

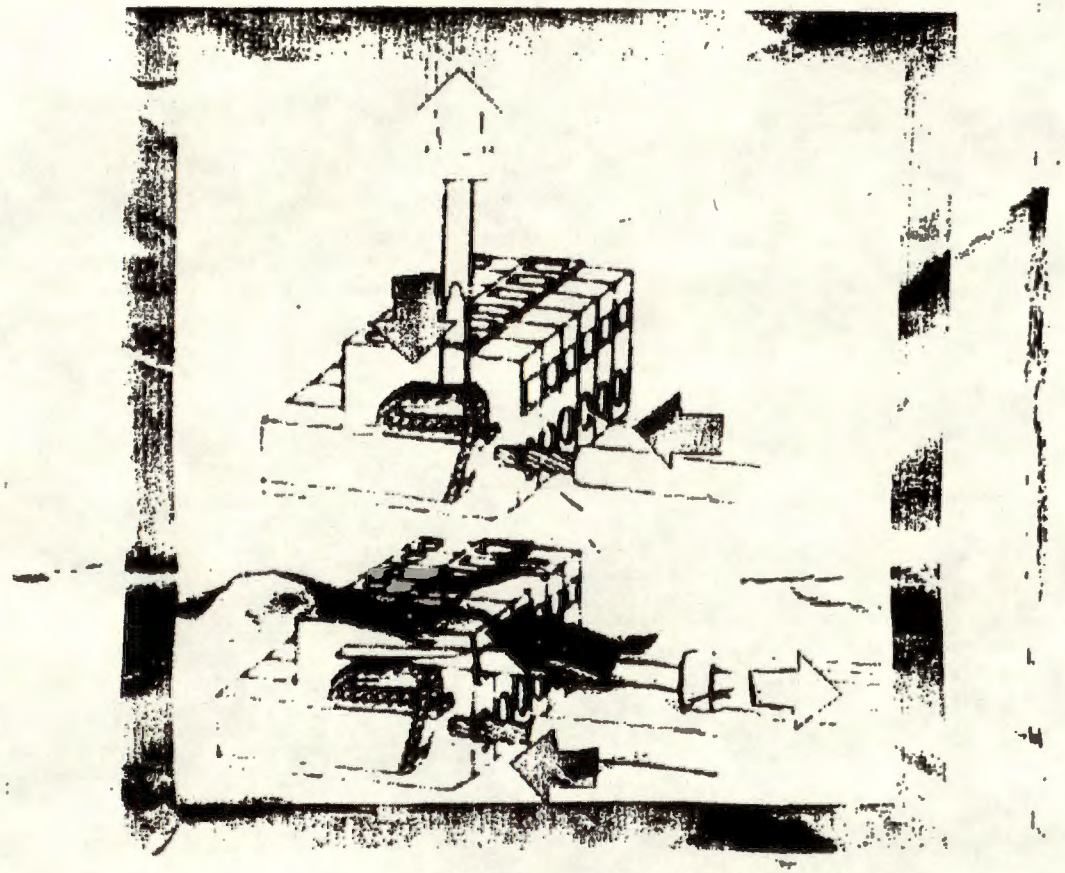
1. Always disconnect power supply before inspecting or working on the heater.

2. Generally the unit requires no maintenance since the bearings are permanently lubricated and sealed. The fan cannot be field serviced; it should be replaced if defective. Contact Hoffman Enclosures Inc. for replacement parts.

To avoid electric shock, do not energize any circuits before all internal and external electrical and mechanical clearances are checked to assure that all assembled equipment functions safely and properly.



Wiring Schematic



Wiring Illustration
Verdrahtung Abbildung
Illustration d'enfilement

D-7

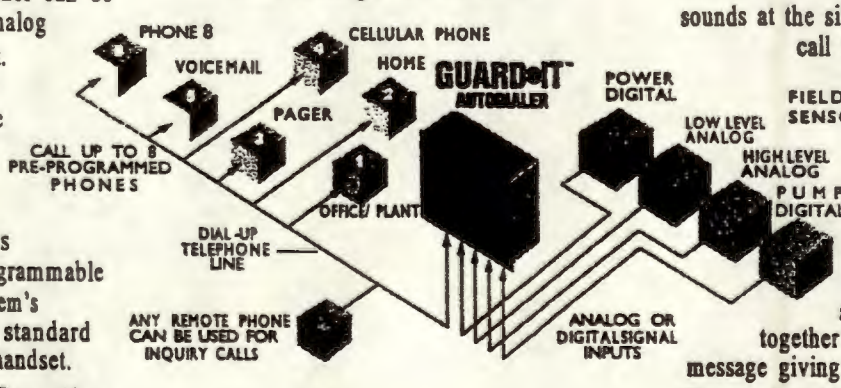
ALARM AUTODIALER

...a new low-cost autodialer with flexible features for dependable Alarm Autodialing and Remote Monitoring.

GUARD-IT delivers the functionality you need, and it's backed by RACO's reputation for dependability, quality, service, and factory support.

Analog or Digital Inputs

GUARD-IT monitors 4 input channels. Each channel can be configured for an analog or digital signal input. The system utilizes the public telephone network as a basic medium for transmission of alarm messages and status calls. It is field programmable by the user at the system's control panel via a standard touch tone phone handset.



Automatic Alarm Reporting

Upon detection of an alarm condition, GUARD-IT automatically calls a list of up to 8 pre-programmed phone numbers over the standard dial-up telephone network, calling until it gets an acknowledgement. When a connection is made, the system reports the station identity and the specific alarm condition in the form of a digitally pre-recorded voice message. In addition to standard phones in office, plant, or home, the alarm calling sequence can also include calls to pagers, cellular phones, and voice mail.

Alarm Acknowledgment

An alarm is acknowledged simply by pressing a button on the called phone. When acknowledging an alarm, a built-in microphone permits the caller to listen for background sounds at the site. The user can also call the system from any remote phone for a status report of all points being monitored.

Voice Messaging

The voice transmission consists of a station identification together with an alarm message giving details on the fault. The station identification and alarm messages are digitally recorded by the user. RACO pioneered the concept of using digitally-recorded and synthesized voice messages in autodialers. By using electronic voice reporting technology, GUARD-IT eliminates the need for often-unreliable audio tape autodialers.

(Continued on back page)

Received By Marcia 11/25/96

GUARD-IT™

Set-up and Programming

System set-up, voice recording, and programming is accomplished via an external touch tone phone which plugs into a standard phone jack on the system's front panel. The user simply follows voice instructions given over the phone.

System Controls

System operating status is provided by front panel LED indicators. System off/disarm/ready controls are provided on front panel. Surge protection and noise suppression are standard.

A Truly Modem Autodialer

GUARD-IT fills the requirement of a modern autodialer–it should be extremely reliable and be able to tell the called party as much information about the nature of an alarm as possible so that the right personnel can respond quickly and appropriately. Many other autodialers don't meet these requirements.

Compare GUARD-IT with all the others and you will see that this multi-featured system offers a way to get RACO flexibility, quality, and dependability at a price you'd expect to pay for one of the budget models.

Specifications

ELECTRICAL

Power Requirements: User supplied 10-14 VDC, 500 mA max.

Power consumption:
200 mA minimum standby
500 mA maximum active

Power failure: Automatic alarm for external power failure.

Battery Charging: Precision voltage controlled, automatic rapid recharge after drain.

Universal Signal Inputs:
Digital Inputs; open contacts see 5VDC, closed contacts see 5 mA DC

Analog Inputs; 4-20 mA, single ended. Maximum voltage drop 10 VDC. Resolution 0.2%; absolute accuracy 0.5%

Local Alarm Relay: Transistor output for TTL or relay drive (500 mA 24 VDC max) activated during unacknowledged alarm.

RJ11 Telephone line jack for connection to public telephone netowork.

PHYSICAL

Surge protection: Solid state protectors on phone, power, and signal lines.

Enclosure: Single circuit card in durable steel cabinet designed for mounting on control panel wall or flush mounted inside a larger control panel with faceplate visible.

Weight: 4 pounds, 6 pounds with battery

Dimensions: 6.85"Hx8.85"Wx2.85"D

Mounting Centers: 3.6"Hx9"W

ENVIRONMENTAL

Temperature range: 20° to 130°F.

Humidity: 0 to 95%, noncondensing.

TELEPHONE

Rotary pulse or tone dialing.

Dials up to 8 different numbers, each up to 60 digits long.

Time between alarm phone calls programmable 0.1 to 99.9 minutes.

Smart calling call progress monitoring detects dial tone, basic ringback and busy signal.

Alarm acknowledgement by touch tone key or callback.

Compatible with most pager, cellular, and voicemail systems.

User-furnished standard touch tone handset required for programming. FCC Registered.

PROGRAMMING

Standard phone jack on front panel for programming phone. Voice menu instructions guide programming.

SPEECH MESSAGES

User digitally records five messages, Station ID and four channel alarm messages. High definition digital recordings up to 12 seconds per message. Resident synthesized voice vocabulary for programming guidance.

FACTORY OPTIONS

Power Supply, UL Class 2 120 VAC 50/60 Hz adaptor.

Battery backup, internal 6 volt; 4 AH gel cell provides 20 hours operation during power failure.

NEMA 4X enclosure.

Cellularm cellular communication system.

WARRANTY

Two year parts and labor warranty. See separate warranty card for details.

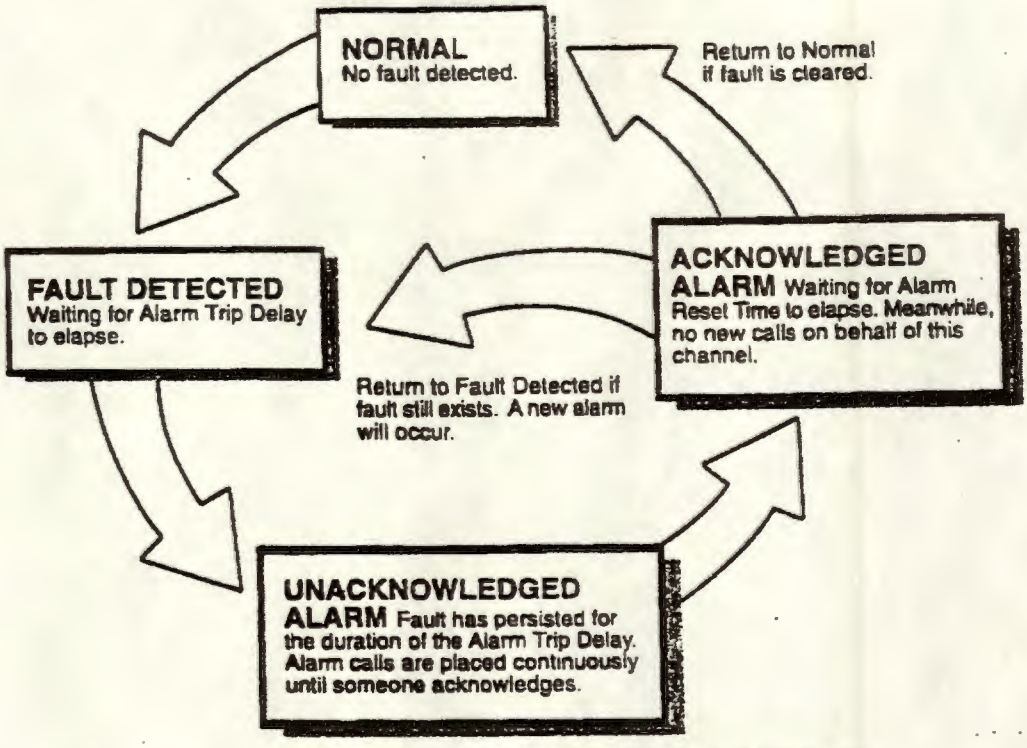
For ordering information, call toll free at... 800-722-6999

SINCE 1948
RACO
REMOTE ALARMS AND CONTROLS

1948-1998 50 ANNIVERSARY

RACO MANUFACTURING
AND ENGINEERING CO.
1400 - 62nd. St.
Emeryville, CA 94608
Phone: 510-658-6713
Fax: 510-658-3153
E-Mail: sales@racoman.com
www.racoman.com

Guard-It™ Alarm Process Diagram



Channel Light (LED) Indications:

Steady green - Normal

Flashing green - Fault detected but alarm trip delay not timed out.

Flashing red - Unacknowledged alarm.

Steady red - Acknowledged alarm

Power Failure Alarm (LED) Indications:

Flashing red indicates loss of external 12 VDC power. After 5 minutes, alarm calls will be placed. Upon acknowledgement, light is on with no flashing until powered is restored.

GUARDIT™

Owner's Manual

SINCE 1948

RACO

REMOTE ALARMS AND CONTROLS

Warranty

Raco Manufacturing and Engineering Co. Inc., warrants this product to be in good working order for a period of two years from the date of purchase as a new product. In the event of failure of any part(s) (excluding batteries), due to defect in material or workmanship occurring within that two year period, Raco will, at it's option repair or replace the product at no charge for parts or labor. All billable repairs after the two year period will carry a ninety day warranty. Any alteration of the product without instruction from Raco's Engineering Department will automatically void this warranty. If alterations of the unit are authorized by Raco, please complete the authorization form in the Owners Manual and return the form to Raco to ensure the warranty. Under no circumstances will Raco be responsible for consequential or secondary damages.

The defective product should be returned, insured and freight prepaid, securely packaged to the address listed below. Please call Customer Support at 800 449-4539 for a Return Authorization Number. Customer Support will be available from 8:00 a.m. to 4:30 p.m. (PST), Monday through Friday (excluding holidays). When you call Customer Support with a technical problem or to request a Return Authorization number please have the products serial number and a detailed description of the problem you are experiencing.

Raco Manufacturing and Engineering Co. Inc.
Customer Support
1400 62nd Street
Emeryville, California 94608

Copyright

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Printing History

Printed in USA, May 1997
Raco Manufacturing & Engineering, Co.
1400 62nd Street, Emeryville, CA 94608
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World Wide Web http://www.manufacturing.net/raco

Table of Contents

1 Product Overview

1.1 Product Description

The Guard-It™ alarm autodialer is designed to monitor conditions at remote facilities and place alarm notification telephone calls to personnel, delivering specific pre-recorded messages.

Users may also call the product at any time from any telephone, to check for alarm conditions.

Four signal inputs are provided for monitoring. The signals which the user connects to these four inputs may be any combination of contact closure, digital logic level, or analog 4-20 ma current loop. In addition, the product monitors the 12 volt DC power connected to it, and if an optional rechargeable battery has been installed, it will place alarm calls to report power failures.

The product will work with any standard dial-up public telephone line, as well as with the available Cellularm™ option. Leased lines are not required.

Using a programming phone at the front panel. the user may pre-record informative, high-fidelity voice messages up to 12 seconds in length, for each of the four input channels, plus a station identification message which is played during every phone call.

The user may program up to 8 phone numbers, which may be up to 60 digits in length. The product may also be programmed to call numerical display pagers in addition to regular phone numbers.

If desired, the user may program a number of detail parameters such as alarm trip delays, ring answer delays, etc.

A special Call Progress function may be turned on, which allows the product to detect busy signals and move automatically to the next programmed phone number, delay the voice reporting until the called phone has answered, and move to the next phone number if a programmable maximum number of rings has been exceeded.

A phone line fault monitor function may also be turned on, which detects the disconnection or failure of the phone line.

Informative, multi-color front panel LED's advise local personnel at a glance of any problems.

The product may be mounted on a back surface, or flush into a larger front panel, or as a stand-alone circuit board.

The Guard-It™ autodialer is ruggedly built to a high standard of quality by the world leader in industrial alarm autodialers. It includes internal noise filters and surge protection on all signal, power and phone line inputs, and is built for many years of reliable service.

1.2 Manual Description

This manual guides you through the following procedures:

- Location and mounting
- Initial programming
- Voice message recording
- Using Your Guard-It™ autodialer
- Advanced programming

A glossary explaining the terms used in this manual is included the end of the manual, along with a troubleshooting guide, an index, a return authorization form, and FCC notice to users.

Worksheets are provided to document and clarify your programming and message recording steps.

Please take a moment to read, complete, and mail the warranty registration card at the back of this manual.

1.2.2 Conventions

Throughout this manual various icons are used to visually identify information. They are as follows:

◆ The solid diamond symbol shows a list of procedures, decisions, or single step tasks.

● The bullet symbol shows a list of items.

The bomb indicates a warning message. The information concerns process that may result in damage to equipment or harm to a person.

The hand indicates a caution message. The information concerns a process that may result in equipment failure.

The pencil indicates general information.

The open diamond pattern indicates one or more exceptions or special considerations for a process.

The phone indicates that you can access the Guard-It™ autodialer through your phone.

Other icons include menu indicators as seen on the Guard-It™ autodialer front panel.

"items in quotes"	Quotation marks indicate titles of sections and messages.
italic	Italic text indicates items for emphasis, message text, and sample text.
ALL CAPITALS	Capital letters reference the names of keys, lights, and LEDs.
Initial Capital Letters	Capitalization of the first letter of a set of words indicates mode and function types.

2 Installation

2.1 Mounting Location

Ideally, the Guard-It™ autodialer and the wiring connected to it should be located away from heavy duty power wiring and wiring which is likely to emit substantial electrical interference. The location must be free of condensing moisture, and must remain within a temperature range of 20 to 120 degrees F for proper operation. Allow clearance room for the plug-on connector block and phone line connectors at the bottom.

The product should be located within 5 feet of an RJ11 telephone line jack, otherwise a telephone extension cord will be needed to make the phone line connection.

If you are using the optional 12 VDC wall adaptor to power the product, you will need a 120 VAC electrical outlet to plug the adaptor into. The product should be located within five feet of this outlet; otherwise it may be necessary to splice in additional wire length for the 12 VDC line.

2.2 Mounting Onto A Back Surface

Referring to the diagram, attach the mounting brackets to the product. Prepare the back surface by drilling pilot or clearance holes for the mounting screws. The mounting centers are 3.6" high by 9" wide. #8 Wood screws, self tapping screws and machine screws (with lock washers and nuts) are provided to accommodate a variety of back panel materials. Refer to the diagram (See Appendix F).

2.3 Mounting Flush Into A Front Panel

To mount the product flush into a larger front panel (maximum panel thickness 1/8"), you will need a rectangular cutout in the panel to clear 6-3/16" high by 8-3/16" wide. Slide the product into the opening from the front, and use the 6-32 screws to attach the two mounting brackets to the product in the proper orientation so that they hold the product firmly in place against the larger front panel. Refer to the diagram (See Appendix F).

2.4 Mounting Without An Enclosure

To mount the product as a circuit board only, open the enclosure via the two screws on each side of the enclosure, lift out the front panel, and then remove the four screws which secure the circuit board to the front panel. Pass appropriate mounting screws (not provided with product) through the white nylon standoffs to mount the circuit board to a back surface. The small inner panel is printed with markings to identify the LED's and switch functions.

2.5 Mounting With Cellularm™ Option

If your Guard-It™ autodialer was ordered with the Cellularm™ (cellular wireless) option, the product comes pre-mounted in the Cellularm™ enclosure. Follow the mounting instructions provided for the Cellularm™ option. Refer to the diagram (See Appendix F).

3 Wiring Connections

Note:

Note that the connector block is unpluggable for convenience in making wiring connections.

3.1 Power Connections

The Guard-It™ autodialer requires 8 to 16 VDC power connected to the connector block, in order to operate.

The power source should be capable of delivering a current of 500 milliamperes.

Power must be connected observing the correct polarity. Refer to the diagram.

3.2 Connecting To Electrical Ground

Your Guard-It™ autodialer has several internal protective devices built in. However, for them to work effectively it is important that the product be well grounded. A grounding wire with a terminal lug is included on the product for this purpose.

If the Product is mounted to a grounded metal back surface, then simply connect the terminal end of the wire to the lower right hand mounting screw as shown in the diagram.

If the product is not mounted to a grounded metal back surface, connect the end of the wire to the nearest available electrical grounding point. If the installation is within a grounded metal electrical panel or enclosure, connecting to the metalwork will be sufficient. If you need to extend the ground wire, use 18 gauge wire or heavier, and keep the total length as short as possible.

This grounding wire will also ground the (-) side of the incoming 12 VDC power. If you are using a pre-existing source of 12 VDC power, you will need to verify that the grounding of the (-) side of this supply will not cause a problem.

3.3 Phone Line Connection

Plug one end of the supplied telephone extension cord into the telephone line jack located to the left of the connector block (not the programming jack located on the front panel). Plug the other end of this same cable into a telephone line (RJ11) jack.

Caution:

The phone line must be such that a standard telephone set can work on it. *Certain in-house PABX phone systems have "digital" line connections which can damage the product!*

Ideally this phone line should be for the exclusive use of the Guard-It™ autodialer. However, the product will generally function if there is an extension phone on the same line, as long as that extension phone is not in use when it is time for the Guard-It™ to place or receive a phone call.

3.4 Input Signal Connections

The four signal inputs on the Product can be used with several different types of input signals, in any combination.

3.5 Connecting Unpowered ("DRY") Contact Inputs

Connect unpowered contact inputs as shown in the diagram. Each input has two input connection points. The points marked "C" are internally connected together and to common ground.

Warning:

Before making any such connections, verify that there is *no electrical power present on the signal wires,* otherwise serious damage to the product could result.

3.6 Connecting Analog or Digital Logic Signal Inputs

Refer to Appendix A regarding analog signal inputs and Appendix B regarding digital logic signal inputs.

3.7 Optional Digital Alarm Output (DAO) Connections

The digital alarm output circuit activates whenever there is an unacknowledged alarm. It deactivates whenever such alarms are acknowledged. It may be used to power a customer supplied 12 VDC relay, or to drive a 5 volt logic circuit. See appendix C for details.

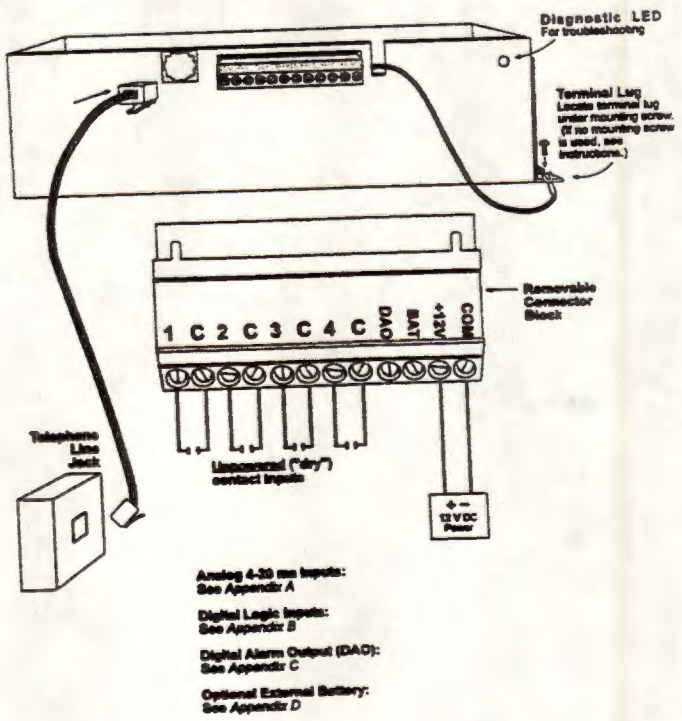
3.8 Optional External Battery Connections

The Product may be used with a customer-supplied external 6 VDC (not 12 VDC) gel cell lead acid battery for backup during power failure. An internally mounted gel cell battery is also an available as an option from Raco. Refer to appendix D if using an external gel cell battery.

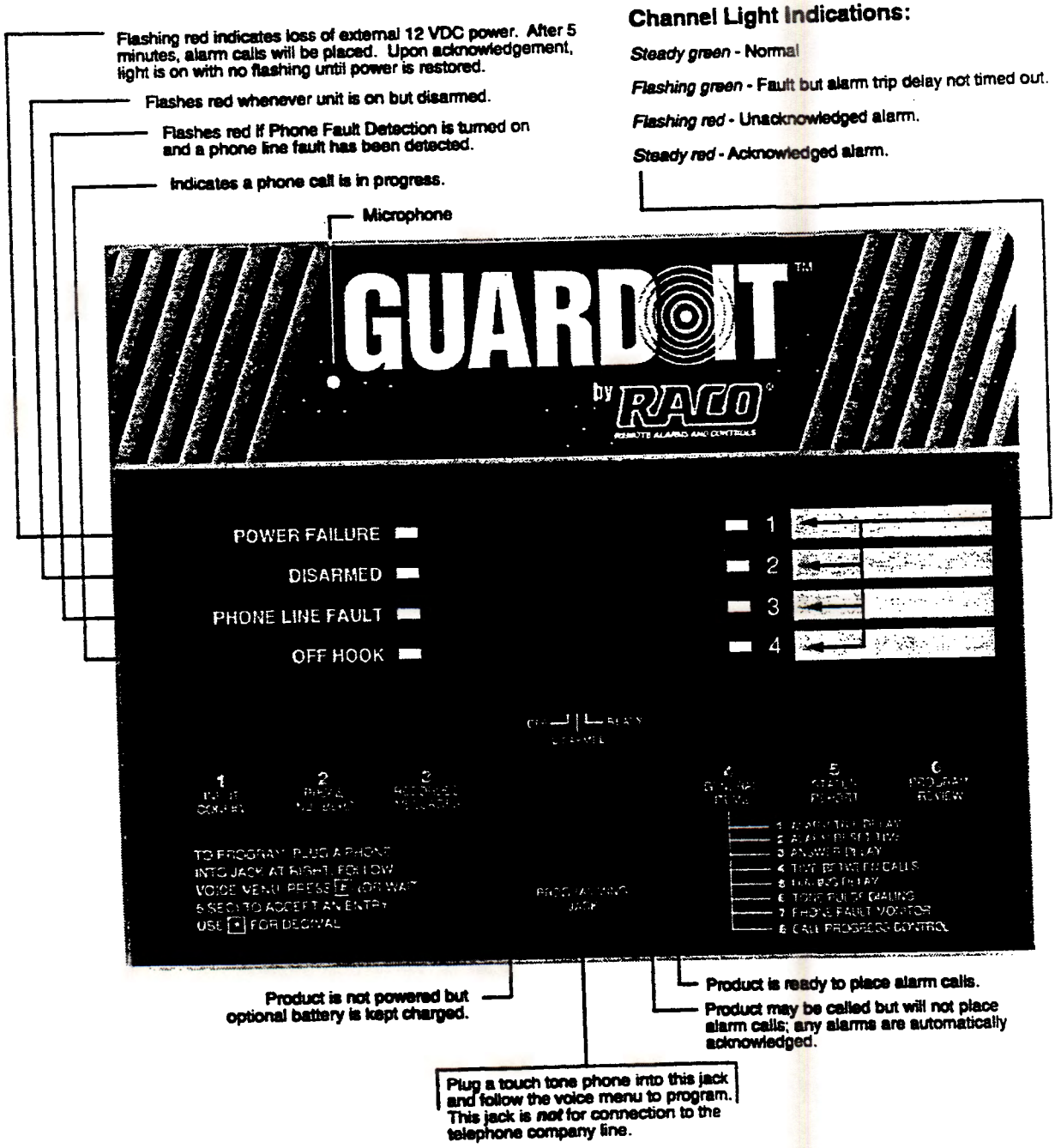
3.9 Writing Channel Descriptions In White Bar Areas

You may want to use the white bar area to the right of each of the four input channel status LED's, to write in short descriptions of what each input channel is being used to monitor. You may use a plain lead pencil (which is erasable), or a marker pen.

Basic Wiring Connection Diagram



Guard-It™ Front Panel Diagram



4 Programming Your Guard-It™ Autodialer

4.1 Programming Menu

To program your Guard-It™ autodialer, you will need a standard touch-tone telephone.

Telephones which have the keypad located separately from the handset, are most convenient for this purpose.

Just plug the telephone temporarily into the Programming Jack on the front panel of the product, lift the receiver, and follow the voice menu to enter your programming and record your voice messages.

If you do not make any selection from the "top" menu, it will be repeated once and then the program mode will be terminated.

To begin again, simply hang up the programming phone for a second or so, and then pick it up again. You may do this from most places in the programming menu, whenever you want a fresh start.

For most programming items, you will hear the present programming entry if any, and then you will be given a chance to either accept this existing entry by pressing pound (#), or else make a new entry.

If you make a new entry, it will be repeated back to you for confirmation.

In general, pressing the pound (#) key will cause whatever you have keyed in to be accepted and recited back for confirmation.

When keying in a menu choice rather than a value, the choice will be accepted and recited without need to press pound (#).

Pressing the pound (#) key when you have not keyed in any entry, will generally return you to the previous menu level.

If you make an entry that the Product considers invalid, it will respond with a statement, *"Value fault. Enter a new value."* The previous valid setting will be retained and restated, and then you will be prompted to make a new entry if you wish to do so. This would occur, for example, if you entered a value that was outside the allowable range of values for that programming item.

Guard-It™ Programming Flow Chart

Range of Values Table

PROGRAM ITEM	DEFAULT	RANGE
Input On/Off	On	On, Off
Alarm State if configured for contact input	Closed is alarm	Closed, Open
Alarm Set Points If configured for Analog Input	Off	0.0-99.9%, Off
Telephone Numbers	None	Up to 60 digits
Alarm Trip Delay All inputs (Power Fail Delay is 5 minutes fixed)	2.0 sec	0.1-999.9
Alarm Reset Time	1.0 hours	0.1-99.9
Ring Answer Delay	1 ring	1-20
Time Between Calls	10 min (10-99.9)	0.1-99.9 If there is only one phone #
Dialing Delay	10 sec	1-20 sec
Tone/Pulse Dial Mode	Auto	Auto, Tone, Pulse
Phone Fault Monitor	Off	On, Off
Call Progress Control	Off	Off, On
Max rings before abandon call (When CPC is on)	5 rings	4-20

Refer to the table later in this section, for a listing of the initial default values and allowable range of values which you can program, for each programming item.

Note:

If you delay more than five seconds without pressing any new key, the Product will treat this the same as pressing the pound (#) key, except when recording messages.

Also note that your Guard-It™ autodialer will not respond to new alarm conditions while you are programming. The LED's will generally remain in the state they were in prior to the beginning of the programming session, until a few seconds after the programming session has ended. Most program changes do not take effect until you end the programming session. The same is true during an alarm call; messages for new alarms are not included in a call that is already underway.

4.1.1 Input Configuration

1 INPUT CONFIG.

The default input configuration for each of the four input channels is *contact input, alarming on closed circuit.*

If you need a different configuration, after selecting [1] from the top menu, you must select which of the four available input channels (first, second, etc.) you want to configure. The voice menu will ask you for this number which will be a number from 1 to 4.

After you select the input channel number to configure, the voice menu will prompt you with the following choices:

- [1] Alarm on Open Circuit
- [2] Alarm on Closed Circuit (which is the default setting)
- [3] Off (so that this input channel will not report or activate its corresponding front panel LED)
- [4] Analog (4-20 ma current loop) signal.

If an input channel is configured for an analog signal, the menu also gives you two additional choices:

- [5] To program an analog high alarm level set point value
- [6] To program an analog low alarm level set point value

Example:

To configure input channel 3 to alarm on Open Circuit, from the top menu press:

```
1 3 1
```

Refer to Appendix A for additional information on programming for analog signal inputs.

4.1.2 Phone Number Programming

2 PHONE NUMBERS

You must program at least one phone number for your Guard-It™ autodialer to dial when it has an alarm to report.

Note:

Until you do so, any alarms which are detected will be automatically acknowledged without any alarm calls being placed.

To program phone numbers, you must first select which of 8 available phone numbers (first, second, etc.) you want to program. The voice menu will ask you for this number, which will be a number from 1 to 8. Then it will recite the presently programmed phone number for that selection, if any. Then it will allow you to accept the current entry by pressing pound (#), or else enter a new phone number for that selection.

Be sure to include any necessary prefixes or area codes, just as you would dial it on an ordinary telephone.

As you enter each digit, be sure to listen for the voice to repeat back that digit, before you enter the next digit.

Example:

To program the third phone number to be 1 (510) 658-6713, from the top menu you would press [2] for phone number programming, then [3] to select the third phone number, then:

```
1 5 1 0 6 5 8 6 7 1 3 #
```

Listen carefully as the completed entry is repeated back to you, to be sure it was entered and accepted correctly.

To delete a phone number, program it to be 00.

For example, to clear out the fourth phone number, from the top menu you would press [2] for phone number programming, then [4] to select the fourth phone number, then:

```
0 0 #.
```

To program a phone number for use with numeric pagers, see Appendix E.

4.1.3 Recording Voice Messages

3 RECORDED MESSAGES

Your Guard-It™ autodialer has "canned" generic alarm messages ("Channel one alarm", etc.) but you will probably want to record your own more specific and informative alarm messages.

There are five alarm messages which you can record: a message for each of the four input channels, plus a "Station ID" message which identifies the site where the Product is located.

In order to prevent one message from being recorded or re-recorded over another message, *it is necessary to record all five messages, in proper order, in one sequence of steps.*

Under the Message Review and Recording menu which you get by pressing [3] from the top menu, you will be prompted to choose:

- [1] to review the existing set of five messages, or
- [2] to begin the sequence of recording all five messages.

If you select [2] to begin the recording sequence, the Guard-It™ autodialer moves you automatically through the sequence of all five messages to record, starting with the message for input channel number one.

The voice menu identifies which message is to be recorded next (i.e. for input channel number 1, for input channel number 2, etc.).

To actually record the message, wait for the sound of the beep, then speak clearly into the telephone mouthpiece of the programming phone. When you are done, press pound (#). The Product will then play back the message you have just recorded.

If you want to re-record the resulting message after hearing it played back, press star (*) instead of pound (#). You may re-record as many times as you wish, until you are satisfied with a given message. When you are satisfied with the message, press pound (#) to move on to the next message.

Proceed in this manner to record ***all five messages***. The Station ID message is the last message in the set of five messages. It is the message that will be recited during every phone call, to identify the site that is calling or being called.

If you have configured a given input channel as "OFF", you will still be asked to record a message for it. Just "record" a moment of silence for that departed input channel, and proceed with recording the remaining messages.

For any input channels which you have programmed for analog signal input, record the message in the form of: "The water level percentage is". Whenever you call in or when an alarm call is placed, analog channels will be reported with the message you record followed immediately by the percentage value. You may want to include a spoken reference to the translation table which is found in Appendix A.

If you later need to change a message, simply re-record the entire set of 5 messages.

Each message may be as long as 12 seconds, for an available total of 60 seconds.

4.1.4 General Programming Items

4 GENERAL ITEMS

The following general programming items allow you to "custom tailor" some specialized aspects of product operation.

Many users will find that the default settings work well, without need to program any of the items in this general category.

4.1.4.1 [1] Alarm Trip Delay

The alarm trip delay is the number of seconds during which the alarm violation (fault) must be continuously present on any input channel, before the Product will trip that input channel into Unacknowledged Alarm condition and begin dialing the first programmed phone number.

The default value is two seconds. If you wish to alter this value, the range of programmable values is 0.1 to 999.9 seconds. Use the star (*) key if you want to use a decimal point, but it is also OK to use whole numbers.

During the time period when a fault exists but has not yet lasted long enough to trip an alarm, the LED for that input channel will change from green to flashing green. Also during this interval, if you should hear a spoken status report on this channel, the word "fault" will be added to the message.

Note that the Product also has an internal power failure alarm. The trip delay for this alarm is fixed at 5 minutes.

4.1.4.2 [2] Alarm Reset Time

In the Unacknowledged Alarm state, the Product will place alarm calls, going endlessly through the list of up to 8 programmed phone numbers until the alarm is acknowledged by someone pressing a "9" at the sound of the tone, or by placing a return call to the Product and pressing "9" at the sound of the tone.

Either way, when the alarm is acknowledged, further alarm calls on behalf of that input channel (or power failure alarm) will be suspended. An internal Alarm Reset Timer begins timing, and when it has completely timed out, the acknowledged alarm status for that input channel is automatically cleared. As a result, if there is no current alarm condition, no new alarm will be created. If an alarm condition does still exist, then after the alarm trip delay expires, a new Unacknowledged Alarm and alarm calling will occur.

The default value for the Alarm Reset Time is one hour. If you wish to alter this value, the range of programmable values is 0.1 to 99.9 hours. Use the star (*) key if you want to use a decimal point, but it is also OK to use whole numbers.

Note:

Note that when testing, once you trip an alarm on a given input channel and acknowledge the alarm, you will not be able to promptly re-create an Unacknowledged Alarm for that input channel, since the Alarm Reset Timer will not have timed out, and this input channel will still be in an Acknowledged Alarm state. To create a new alarm, you can trip an alarm on another input, or you can force a clearout of all Alarm Reset Timers by using selection [7] on the top menu, or by turning the product off and then on again.

4.1.4.3 [3] Answer Delay

When you place a call to the Product, it will wait for a programmed number of rings before answering the call. This number of rings is called the Answer Delay.

The default value is one ring. If you wish to alter this value, the range of programmable values is 1 to 20 rings.

Note About Extension Phones:

The best practice is to provide a phone line service for the exclusive use of the Guard-It™ autodialer. However, if you do need to have an extension phone on the same line for use by personnel, you might want to program a ring delay of, say, 6 rings, so that anyone present at the site would have a chance to answer the call before the Guard-It™ autodialer answers it. If the line is in use by an extension phone when the Guard-It™ tries to place an alarm call, the call will not be completed, but the messages will be heard on the extension phone.

4.1.4.4 [4] Time Between Alarms Calls

After the Product is finished placing a call to a given phone number, and if the alarm was not acknowledged during that call, the Product enters a waiting period before it begins placing the next alarm call. This waiting period is the Time Between Alarm Calls.

The default value is 10.0 minutes. If you wish to alter this value, the range of programmable values is 0.1 to 99.9 minutes.

Note, however, that in order to comply with governmental regulations for alarm autodialers, if only one phone number is programmed, the product will not alllow the time between alarm calls to be less than 10 minutes.

4.1.4.5 [5] Dialing Delay

If you want your Guard-It™ autodialer to place alarm calls to a numerical pager, you will need to refer to Appendix E for special instructions, which include programming the special Dialing Delay.

The default value is 10 seconds. If you wish to alter this value, the range of programmable values is 1 to 20 seconds.

4.1.4.6 [6] Tone/Pulse Dialing

Your Guard-It™ autodialer is capable of dialing using Pulse Dialing or Tone Dialing.

- For Tone Dialing, press [1]
- For Pulse Dialing, press [2].
- For "Auto Detect," press [3]. This is the default setting.

When Auto-Detect is chosen, the Product will periodically test the phone line and it will automatically use Tone Dialing if it determines that Tone Dialing works on the phone service line it is connected to.

4.1.4.7 [7] Phone Fault Monitor

Occasionally a telephone line will cease to operate. When the Phone Fault Monitor function is turned on, the Product will go "off hook" to check for the presence of a dial tone. If it fails to hear a dial tone, it begins flashing the "PHONE LINE FAULT" LED on the front panel, and continues to do so until such later time as it again hears a dial tone during another periodic check.

This action of going off hook every few minutes (as indicated by the yellow light on the front panel) may make it seem like the product is behaving erratically, to someone who is not familiar with its functioning.

Because the line is checked only periodically, if there is a change in the status of the phone line connection, *it will take a few minutes for the LED to reflect the change.*

Note:

Note that if this feature is turned on and there is another phone device connected to the Guard-It™ autodialer's phone line, if that device happens to be "off hook" (in use) when the product checks the phone line, a phone line fault indication may occur.

Even if the product has detected an apparent phone line fault, if it needs to place an alarm call it will attempt to do so. Thus in some circumstances during a call to or from the product, you might hear the message "phone line fault, now normal." This generally would mean that a phone extension was in use at last check, or that the phone line is intermittent and should be checked.

When the product has detected a phone line fault and then subsequently finds the line to be operational, the warning LED will be turned off. However the verbal warning will be retained until after you either place a call to the product, or acknowledge an alarm call.

Detection of a phone line fault will not cause an attempt to place alarm calls.

The default setting for this feature is "Off". To turn it on, when prompted press [1].

4.1.4.8 [8] Call Progress Control and "Maximum Number of Rings"

The Guard-It™ autodialer can be programmed to monitor the progress of the alarm calls it places, by listening to the tones and voice signals on the phone line.

Based on the signals the product hears, it knows when to start delivering its messages, and it also knows if it should abandon the current call attempt, as described below.

If Call Progress Control is turned on, when placing alarm calls the product counts the number of ring signals it hears. If more than the programmed "Maximum Number of Rings" occurs with no answer, it ends the phone call attempt without issuing any spoken message. It then waits the programmed Time Between Alarm Calls, before placing a call to the next phone number.

If Call Progress Control is turned on, the programming menu will allow you to program this "Maximum Number of Rings." The default value is 5 rings. If you wish to alter this value, the range of programmable values is 4 to 20 rings.

Also when Call Progress Control is turned on, when placing alarm calls the product listens for the ring signals, and only begins speaking when it misses the sound of the next ring. For this reason, there may be a delay of a few seconds after picking up the phone, before the first message is heard, when this function is turned on.

Also when Call Progress Control is turned on, when placing alarm calls the product listens for a busy signal. If it hears a busy signal it immediately ends the call and waits the programmed Time Between Alarm Calls, before placing a call to the next phone number.

The default setting for Call Progress Control is "off".

Call Progress Control depends upon the product's ability to interpret the various tone signals heard on the phone line. Because there is a lot of variance in the nature of these signals from one local phone company to another, it is important to thoroughly test the proper functioning of Call Progress Control, if you choose to turn this feature on.

4.1.5 Status Report (Input Review)

5 STATUS REPORT

This selection in the top menu causes the Guard-it™ to recite the status of any input channels which are in any kind of non-normal state. Any channels which have been programmed "off" will not be mentioned.

4.1.6 Programming Review

6 PROGRAM REVIEW

This feature allows you to review all the programming settings. Any messages which you have recorded will also be recited. We suggest that you use this feature to write all your programming entries on the **Programming Log Sheet** provided in this manual. This will allow you to easily re-create your Guard-It™ autodialer setup should it ever be necessary to replace or reprogram the unit. It is also helpful in the event you need to call for Customer Support.

4.1.7 Acknowledged Alarm Reset

Note:

Note that unlike the other six menu choices, this choice is not printed on the front label of the product.

As previously mentioned, under test conditions you cannot quickly recreate an unacknowledged alarm on a given input when that input is already in an Acknowledged Alarm state. The reset feature allows you to force a clearout of the alarm reset timers, so that all input channels (and power failure alarm) are immediately ready to be tripped into Unacknowledged Alarm for the purpose of further testing or alarm monitoring.

4.2 Restoring Programming To Factory Default Settings

It is possible to restore your Guard-It™ autodialer to factory default settings for all programming items, including clearing out all recorded messages.

To do this, locate the plugged hole in the top of the enclosure, and remove the plug. While the product is turned on (but not in programming mode), use a screwdriver blade or similar device to momentarily connect the two pins which are accessible through the hole.

The four input channel LED's will turn orange while the unit "reprograms" itself to factory default settings. When this process is completed, the LED's are restored to their normal color and the product is ready for new programming.

4.2.1 Programming Log Sheet

Range of Values Table

PROGRAM ITEM	DEFAULT	RANGE	REPROGRAMMED TO:
Input On/Off	On	On, Off	
Alarm State if configured for contact input	Closed is alarm	Closed, Open	
Alarm Set Points if configured for Analog Input	Off	0.0-99.9%, Off	
Telephone Numbers	None	Up to 60 digits	
Alarm Trip Delay All Inputs (Power Fail Delay is 5 minutess fixed)	2.0 sec	0.1-999.9	
Alarm Reset Time	1.0 hours	0.1-99.9	
Ring Answer Delay	1 ring	1-20	
Time Between Alarm Calls	10 min (10-99.9)	0.1-99.9 if there is only one phone #	
Interdigit Dialing Delay	10 sec	0-99.9 sec	
Tone/Pulse Dial Mode	Auto	Auto, Tone, Pulse	
Phone Line Alarm On/Off	Off	On, Off	
Call Progress Monitoring	Off	Off, On	
Max rings before abandon call (When CPM is on)	5 rings	4-20	

PROGRAMMING LOG SHEET

PROGRAM ITEM	DEFAULT	RANGE	REPROGRAMMED TO:
Input Channel 1	Alarm on Closed Circuit	Analog, Alarm Closed, Alarm Open, Off	Closed ☐ Open ☐ Analog ☐ Off ☐ _____% *High Set Point* _____% *Low Set Point*
Input Channel 2	Alarm on Closed Circuit	Closed, Open	Closed ☐ Open ☐ Analog ☐ Off ☐ _____% *High Set Point* _____% *Low Set Point*
Input Channel 3	Alarm on Closed Circuit	Analog, Alarm Closed, Alarm Open, Off	Closed ☐ Open ☐ Analog ☐ Off ☐ _____% *High Set Point* _____% *Low Set Point*
Input Channel 4	Alarm on Closed Circuit	Analog, Alarm Closed, Alarm Open, Off	Closed ☐ Open ☐ Analog ☐ Off ☐ _____% *High Set Point* _____% *Low Set Point*
Phone Number 1			
Phone Number 2			
Phone Number 3			
Phone Number 4			
Phone Number 5			
Phone Number 6			
Phone Number 7			
Phone Number 8			
Message for Input 1	Channel 1 Alarm		
Message for Input 2	Channel 2 Alarm		
Message for Input 3	Channel 3 Alarm		
Message for Input 4	Channel 4 Alarm		
Message for Station ID	This is Phone Alarm Station		

PROGRAM ITEM	DEFAULT	RANGE	REPROGRAMMED TO:
Ring Answer Delay	1 ring	1-20	
Time Between Callls	2.0 seconds	0.1-999.9[1]	
Alarm Reset Time	1.0 hours	0.1-99.9	
Tone/Pulse Dialing	Auto detect	Tone, Pulse, Auto	
Pager Dialing Delay	10.0 seconds	0.1-99.9	
Phone Line Fault Monitor	Off	On, Off	
Call Progress Monitor	Off	On, Off	
Max Rings Before Abandon Call Atempt [3]	5	4-20	
Input Channel 4	Alarm on Closed Circuit	Analog, Alarm Closed, Alarm Open, Off	

Notes:

[1] For power failure alarm, Alarm Trip Delay is fixed at 5 minutes.

[2] Minimum programmable Time Between Calls is 10 minutes, if only one phone number is programmed.

[3] Call Progress Monitoring must be On for this to apply.

5 The Guard-It™ Autodialer In Operation

5.1 The Alarm Process

Much of the operation of the Guard-it™ was explained in the previous chapter on programming.

To review the sequence of events that starts with the detection of a fault condition on a given input channel, refer to the Alarm Process diagram.

Please keep in mind the following facts:

A fault condition must be detected continuously for the duration of the programmed Alarm Trip Delay, before an Unacknowledged Alarm will occur. During this timeout, the corresponding input channel LED will blink green.

The Alarm Trip Delay for input channels is programmable, with a default value of 2 seconds. For power failure alarm, the Alarm Trip Delay is fixed at 5 minutes.

Once an Unacknowledged Alarm occurs, the corresponding LED will blink red, and alarm calls will be placed indefinitely until the alarm is acknowledged, even if the fault condition returns to normal.

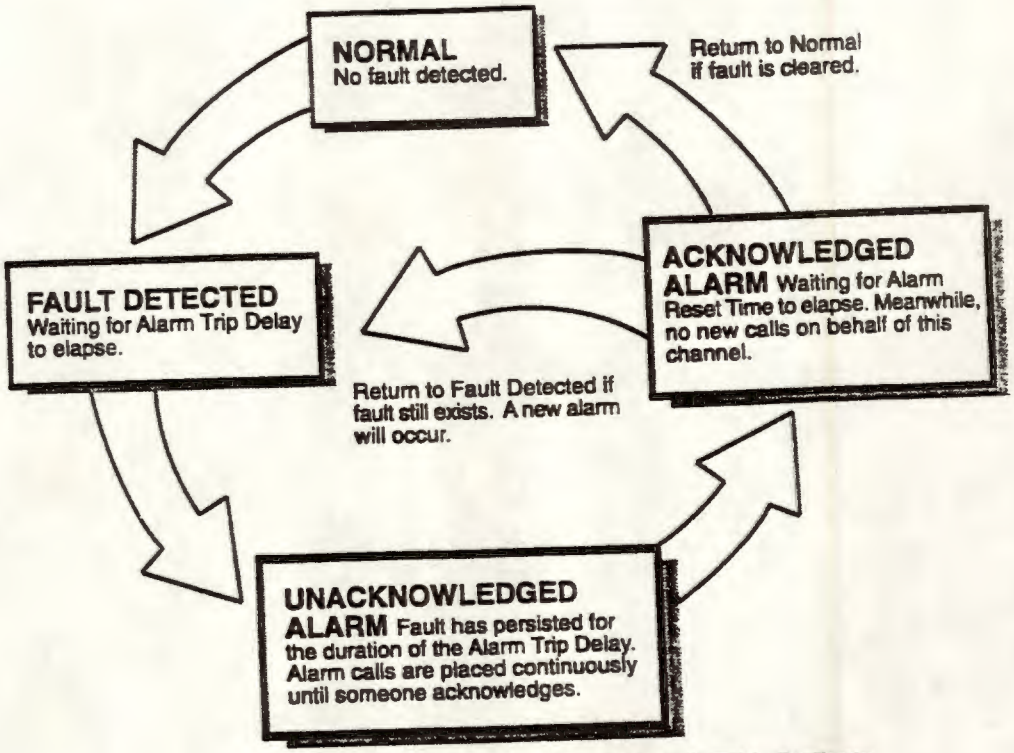
When the alarm is acknowledged, the corresponding LED turns solid red, and further alarm calls on behalf of that input channel (or power failure alarm) will be suspended.

At the moment of acknowledgment, an internal Alarm Reset Timer begins timing, and when it has completely timed out, the acknowledged alarm status for that input channel is automatically cleared. As a result, if the fault condition no longer exists, no new alarm will be created. If a fault condition does still exist, then after the alarm trip delay elapses, a new Unacknowledged Alarm and a new cycle of alarm calling will occur.

If the product loses all power or is turned off, when power is restored the acknowledged alarm status will have been cleared. Therefore, if a fault is still present, then after the alarm trip delay has elapsed, a new unacknowledged alarm will occur, resulting in new calls being placed.

If the OFF/DISARMED/READY switch on the front panel is in the DISARMED position, any such alarm will be automatically acknowledged so that no alarm calls will be placed.

Guard-It™ Alarm Process Diagram



Channel Light (LED) Indications:

Steady green - Normal

Flashing green - Fault detected but alarm trip delay not timed out.

Flashing red - Unacknowledged alarm.

Steady red - Acknowledged alarm.

Power Failure Alarm (LED) Indications:

Flashing red indicates loss of external 12 VDC power. After 5 minutes, alarm calls will be placed. Upon acknowledgement, light is on with no flashing until powered is restored.

If the phone line connected to the Guard-it™ autodialer has an extension phone and it is in use at the time the product attempts to place an alarm call, the call will not go through to the programmed phone number, but the alarm message will be superimposed on the phone call in progress on the extension phone.

Note that the alarm reset function is somewhat similar to a "snooze alarm" on an alarm clock. If someone acknowledges an alarm but does not correct the condition, a new series of calls will be placed after a "snoozing" period has elapsed.

5.2 Receiving And Acknowledging An Alarm Call

When you receive an alarm call from your Guard-it™ autodialer, listen to the message to learn what alarm(s) exist. The message round will start with the Station ID message, followed by the specific alarm message for the input channel(s) in alarm, and/or a message stating "power is off".

Note that any input channels which have been programmed for analog, will be reported regardless of whether they are in alarm or not. If there is a high or low level alarm on an analog channel, the words "high (or low) level alarm" will be added.

The additionally informative words "fault", "now normal", and "acknowledged" may be added as follows:

If the input of a given input channel is in fault but has not yet persisted long enough to trip an alarm for that input, the message for that input will be included with the word "fault" added.

If the input of a given channel in alarm has returned to normal as of the time of the phone call, the message for that input will be included with the words "now normal" added.

If a given input channel is already in an acknowledged alarm state, the message for that input will be included with the word "acknowledged" added.

At certain points in the message round, a prompting beep will be issued. This is your cue to press a "9" immediately after the tone to acknowledge the alarm. Upon detecting the "9", the Product will say "Alarm is acknowledged. Goodbye", and the call will end.

Following the final message round, the microphone will be turned on so that you can hear sounds occurring in the area of the product. Then there will be one last beep to allow acknowledgment before the call ends.

If you do not acknowledge an alarm call, the Product will end the call and wait for the programmed Time Between Alarm Calls (default 10 minutes), before going on to place a call to the next programmed phone number, repeating the calling endlessly until the alarm is acknowledged.

If the Call Progress Monitoring function is not turned on, you will generally pick up the phone in the middle of a message. Simply continue to listen, and the message will continue to the start of a complete new round.

If the Call Progress Monitoring function is turned on, there may be a delay when you answer the phone, before the messages begin.

You may also acknowledge the alarm by placing a return call to the Guard-it™ autodialer. The best way to do this is to wait for the alarm call to end before you place your return call, so that the line will not be busy. At the sound of the prompting beep, press a "9", and the Product will respond by saying "Alarm is acknowledged. Goodbye."

9

5.3 Power Failure Alarms

The alarm trip delay for power failure alarm is fixed at 5 minutes.
Note that you can only receive a power failure alarm if an optional rechargeable lead acid "Gel Cell" battery is installed, since otherwise the power failure would prevent operation of the product. If you have installed an external "uninterruptible" source of 12 VDC power for the product, it will not know that there has been a failure of primary power unless this is reflected at one of the signal inputs.

5.4 Placing An Inquiry Call To The Guard-It™ Autodialer

You may call the Guard-it™ autodialer at any time other than when you are programming, to get a status report of all input channels.

The product will answer the phone after waiting for the programmed ring answer delay (default 1 ring).

The message you hear may include particular informative phrases such as "no phone numbers programmed", "power is off", "disarmed", etc. There will be two complete message rounds, followed by a listening period when the microphone is turned on, before the product ends the phone call.

If there are any unacknowledged alarms, you may acknowledged them by pressing "9" immediately following the beep.

5.5 Acknowledging An Alarm From The Front Panel

To acknowledge an alarm from the front panel, move the selector switch to the DISARMED position, then return it to the READY position. The product must not be in programming mode or presently placing a phone call, for the alarm to be acknowledged in this way.

5.6 Clearing An Acknowledged Alarm From The Front Panel

To force a clearing of the acknowledged alarm status in advance of the time when the alarm reset timer would otherwise do it, select choice [7] from the top menu, or simply turn the product off and then on again. If there is still a fault being detected, then after the expiration of the alarm trip delay, a new unacknowledged alarm will occur with new alarm calls being placed.

6 Troubleshooting & Repair Service

If the product appears "dead" with no lights or action of any kind, suspect the external power source (most likely) or a blown internal fuse (less likely). There is a diagnostic light located behind a round hole on the lower right hand edge of the enclosure. If this light is lit, it means that there is at least 8 VDC (the minimum voltage required) reaching the product and that the internal fuse (5 x 20 mm, 0.8 ampere) is good.

In turn, this means that if the light is not lit, then you can track down and correct the problem without need to return the product to the factory for service. If it is lit and the product appears dead, then factory service is needed.

Verify that all connections are correct and that the connector block is plugged firmly into place in the correct orientation.

If there is a problem with phoning, use the programming phone to test the phone line, temporarily plugging it into the premises phone line jack in place of the autodialer connection.

Most other apparent problems, especially at startup, are the result of incorrect connection or programming, or misunderstanding of how the product operates.

If after reviewing this manual you still have difficulty, Raco's Customer Support department is available from 8:00 a.m. through 4:30 p.m. P.S.T. on weekdays.

6.1 Phone Support Procedures

Make sure you have the following before you call:

- Serial #: Found on the enclosure.
- Note the unit's symptoms: Exact speech pattern, what it is saying, if it is calling or not. The more specific and accurate you are in describing the symptoms, the quicker the Customer Support Department will be able to diagnose and troubleshoot the problem. In many cases, it may save a return to the factory.

THEN call 1-800-449-4539 for Customer Support.

If Customer Support determines that the unit needs repair, you will be given a Return Materials Authorization (RMA) number.

If the product needs repair, you may send it to one of the following repair facilities often first telephoning to obtain a return authorization.

6.2 Returning Parts to Factory

Pack all parts well! Send the unit to the address below:

RACO Manufacturing and Engineering Co.
1400 62nd Street
Emeryville, CA 94608

Remember to:

- Put return address on package.
- Include a packing slip.
- Have serial # and RMA # handy when you call in for tracking.

6.3 Canada Depot Repair Summa Engineering

Pack all parts well! Send the unit to the address below:

Summa Engineering, Ltd.
6423 Northam Drive
Mississauga, Ontario
L4V 1J2 Canada

7 Testing

A suitable program of testing is highly adviseable for any alarm autodialer. The frequency and thoroughness of the test should be gauged according to the potential consequences of missing an alarm call.

Test the unit by simulating an alarm at one or more of the inputs. If you have an optional rechargeable battery installed, you can create a power failure alarm by disconnecting the external 12 VDC power source and waiting 5 minutes for a power failure alarm to be tripped.

You can leave the power disconnected and see how long the unit remains operational, running on its optional rechargeable battery. You might temporarily program an alarm reset time of, say, four hours, so that you would get a new set of calls every four hours until the battery lost charge.

8 Maintenance

The only maintenance item on the Guard-It™ autodialer is the optional rechargeable battery. It should be replaced every three years, since it will eventually fail with old age in the same way that an automobile battery does.

Replacements for this battery must be ordered near the time of changeout, since long storage on a shelf without a charger will damage the battery. It may be ordered from Raco or from the manufacturer as printed on the battery.

A

ANALOG (4-20 MA) INPUTS

A.1 Connecting 4-20 MA Analog Signal Inputs

As an alternative to contact inputs or digital logic inputs, you may connect 4-20 ma analog signals to any of the inputs. The connections must be made with the correct polarity. Refer to the diagram.

Note that the negative connection points for each of the inputs are connected to each other, and to common ground, inside the product. Most 4-20 ma signal circuits are "floating" with respect to ground, and for such signal circuits the grounded inputs on the Guard-It™ autodialer will usually cause no problems.

However some 4-20 ma signal circuits already have a connection to ground at some other point in the current loop. If your current loop has such a connection and if you cannot remove it, it is best to install an "isolator" such as Model T700-0000 made by Action Instruments (619) 279 5726 . Otherwise, signal errors will be introduced, both for the Guard-It™ autodialer and for any other elements in the same current loop.

Note that similar devices are available from the same manufacturers, which accept signals in different formats (such as 0-1 VDC, etc.) and which translate such signals into standard 4-20 ma signals which the Guard-It™ autodialer can accept.

The easiest way to verify that there are no grounding problems, is to verify that the current in the loop does not change when the Guard-It™ autodialer is added to the loop.

For example, if there is a chart recorder or readout device in the current loop, first take a reading with the Guard-It™ autodialer completely disconnected from the loop.

Do this by unplugging the connector block and temporarily shorting the + and - inputs on the signal input points on this connector block. Observe the reading, and then remove the short and plug in the connector block to include the Guard-It™ autodialer in the loop, turn it on, and verify that this does not change the reading on the readout device. All power and ground connections to the Guard-It™ autodialer must be in place for this test to be valid. Also, the input channel being tested must be programmed for analog input as described below.

If you are troubleshooting by making voltage measurements across the signal input connection points on the Guard-It™ autodialer, bear in mind that if the product is turned off or if it has not been programmed for analog input, an internal voltage clamp will result in a fixed voltage drop of about 7 VDC. If the product is turned on and the input has been programmed for analog input, a loop resistance of about 220 ohms will result in a voltage drop of approximately 0.88 VDC with a signal level of 4 ma, and approximately 4.4 VDC with a signal level of 20 ma.

A.2 Programming For Analog Signal Inputs

From the top menu, when you select [1] for input programming and then select an input channel number to program, the voice menu will prompt you with the following choices:

[1] Alarm on Open Circuit

[2] Alarm on Closed Circuit

[3] Off (so that this input channel will not report or activate its corresponding front panel LED)

[4] Analog (4-20 ma current loop) signal.

If an input channel is configured for an analog signal, the menu also gives you two additional choices:

[5] To program an analog high alarm level set point value

[6] To program an analog low alarm level set point value

Example: to program input channel number four for analog input, from the top menu you would press [1] for input programming, then [4] to select input number four, then [4] again to configure this input channel for analog input.

Input channels which have been programmed for analog (4-20 ma) signals, will report a 4 ma signal level as 0.0% and a 20 ma signal level as 100.0%. Signal levels between these limits will be reported in linear scale proportion as a percentage between 0.0% and 100.0 %. Note that as a result of this linear analog scale, an input current of 0 ma would give a reading of *minus* 25.0%.

The Guard-It™ autodialer is very sensitive, being capable of detecting variations as little as 0.1%. Absolute accuracy should be within 0.5%. Due to substantial input filtering, it takes several seconds for any sudden change in input level to become fully settled.

A translation table appears below, relating the analog input signal in milliamperes to the spoken percentage reading. It also allows you to write in the corresponding actual physical readings (such as water level in feet, etc.) for various signal levels.

When programming analog high or low alarm set points, enter the set points as a percentage value, using the star (*) key for a decimal point if desired.

EXAMPLE: to enter a high set point value of 56.8% for input channel number 4, from the top menu you would press [1] for input programming, then [4] to select input number four, then [5] to select the high alarm set point for this input channel, and then:

5 6 * 8 #.

The menu will allow you to program high or low analog set points only if the input channel has first been programmed for analog input.

To turn off a given alarm set point so that it will not create an alarm, press "star" (*) and then pound (#).

In operation, whenever a high or low level alarm setpoint is exceeded continuously for the duration of the programmed alarm trip delay, an unacknowledged alarm will occur.

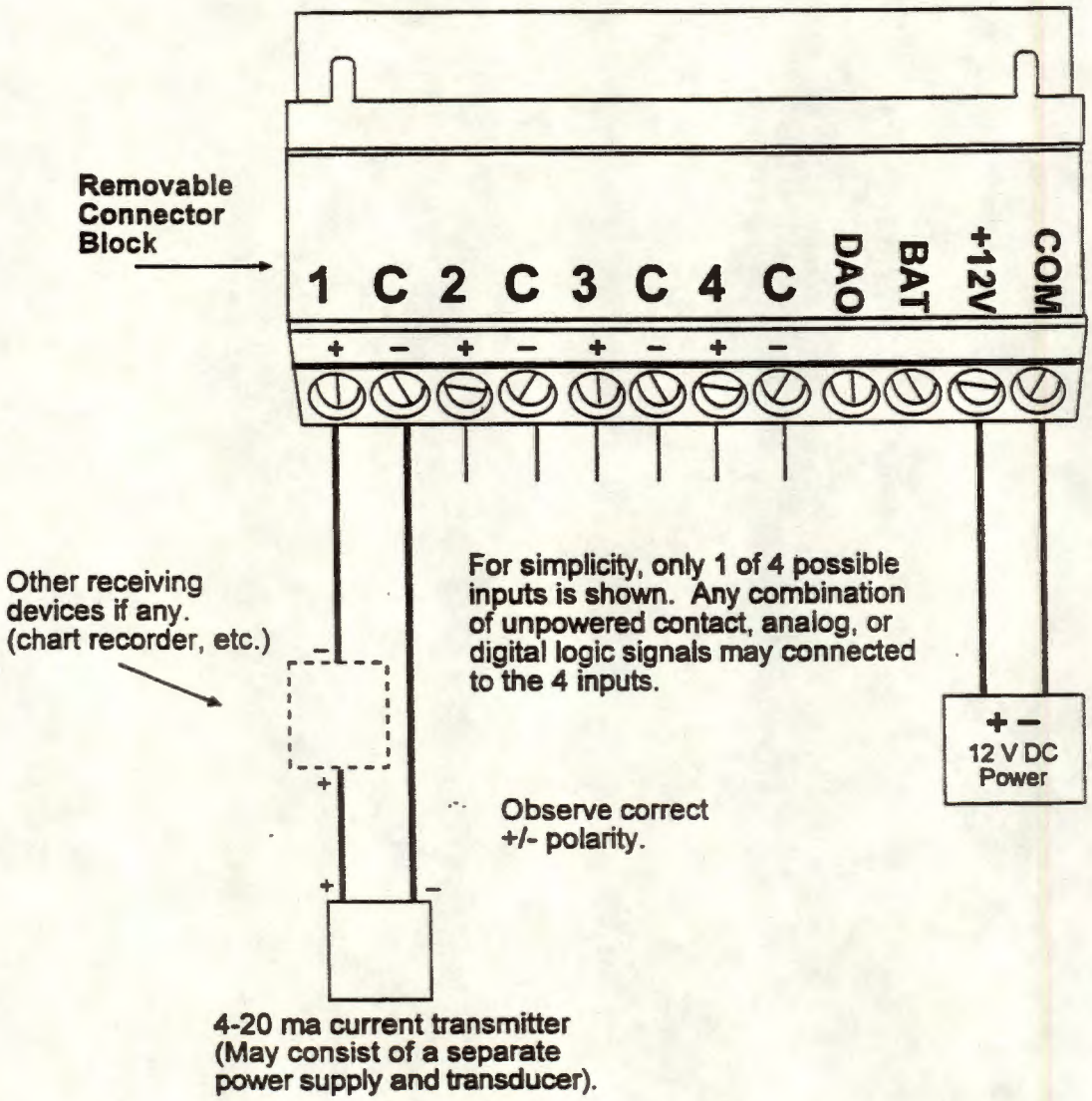
A.3 Analog Translation Table

This table translates various input signal levels in milliamperes, to the corresponding percentage values which will be reported.

It also allows you to write in the corresponding translation to the actual physical parameter being measured, such as water level in feet, etc. You can make copies of this for later use, even including reference to this table in your recorded message, which might be: "Referring to the analog translation table, the water level percentage reading is."

SIGNAL LEVEL:	SPOKEN READING:	CORRESPONDS TO PHYSICAL VALUE ON INPUT CHANNEL NUMBER (Description)			
		1(_____)	2(_____)	3(_____)	4(_____)
4.0 Millamperes	0%				
4.8 Millamperes	5%				
5.6 Millamperes	10%				
6.4 Millamperes	15%				
7.2 Millamperes	20%				
8.0 Millamperes	25%				
8.8 Millamperes	30%				
9.6 Millamperes	35%				
10.4 Millamperes	40%				
11.2 Millamperes	45%				
12.0 Millamperes	50%				
12.8 Millamperes	55%				
13.6 Millamperes	60%				
14.4 Millamperes	65%				
15.2 Millamperes	70%				
16.0 Millamperes	75%				
16.8 Millamperes	80%				
17.6 Millamperes	85%				
18.4 Millamperes	90%				
19.2 Millamperes	95%				
20.0 Millamperes	100%				

Analog 4-20 ma Signal Input Wiring Connection Diagram



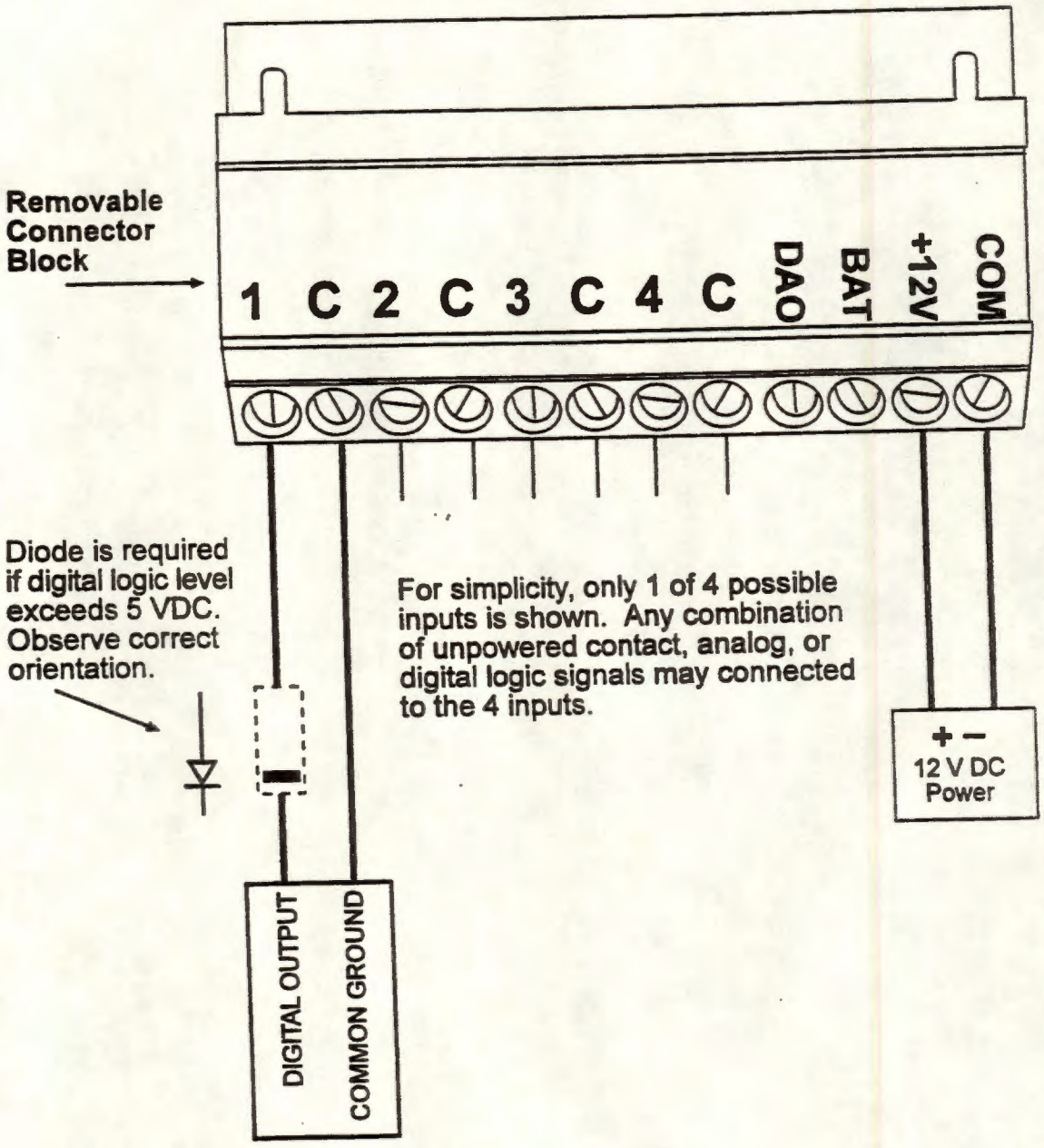
B CONNECTING DIGITAL LOGIC SIGNAL INPUTS

As an alternative to contact inputs, you may connect 5-volt logic signals as long as the common electrical ground for the Guard-It™ autodialer is the same as for the 5 volt logic system.

A logic "0" will be interpreted by the Guard-It™ autodialer as a closed circuit, and a logic "1" will be interpreted as an open circuit.

If you want to connect higher voltage logic signals (up to 24 VDC), insert a rectifier diode (such as a 1N914, 1N4005, etc.) between the logic signal and the signal input on the Guard-It™ autodialer. *The diode must be oriented so that the cathode (banded) end is connected to the logic signal.*

Digital Logic Signal Input Wiring Connection Diagram



C

DIGITAL ALARM OUTPUT (DAO)

The digital alarm output may be used to activate an external device such as the coil of a relay or the input of a logic circuit.

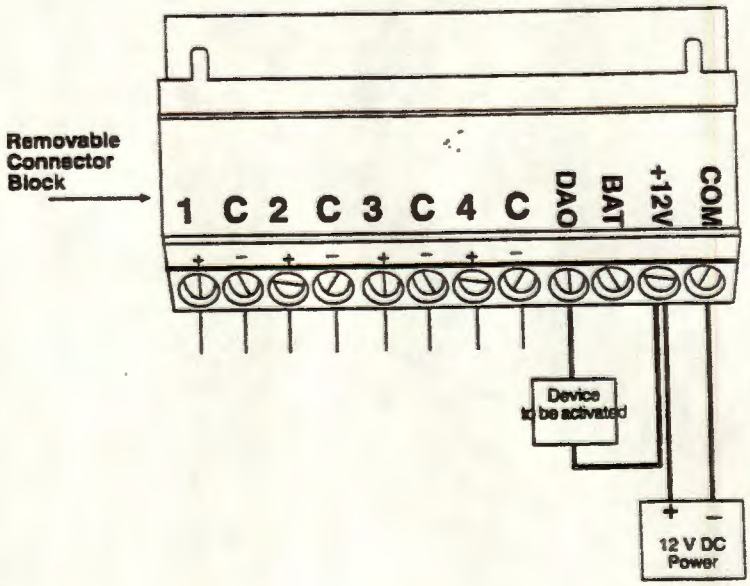
This output is activated (pulled down to common ground voltage) whenever there is an unacknowledged alarm. It is deactivated when the alarm is acknowledged.

The load you connect will have 12 VDC applied across it when activated, if you connect as shown in the diagram. It must draw no more than 200 milliamperes, and so it must have a resistance of at least 60 ohms.

A typical application would be to power the coil of a relay. The contacts of the relay may then be used to control devices of higher voltage and power, such as outside warning lights or buzzers.

Alternatively, the DAO output may be connected directly into a DC logic input circuit. It has an internal 10k resistor pulling it to +5VDC when deactivated, and it is pulled to ground when activated. It may even be connected into a 24 VDC logic input such as found on PLC's, but due to the resistor connected to +5VDC, an external pullup resistor (nominally 1K) to a +24 VDC source may be needed.

Optional Digital Alarm Output (DAO) Connection Diagram



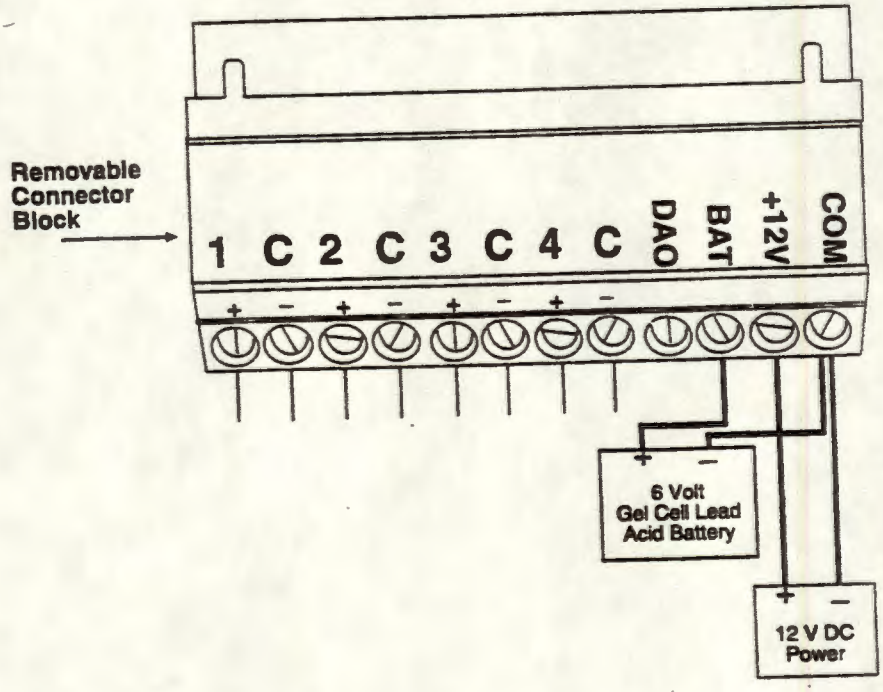
D

OPTIONAL EXTERNAL GEL CELL BACKUP BATTERY

An internal 6 volt, 4 ampere-hour battery is an available option for the Guard-It™ autodialer. However as an alternative or in addition to the optional internal battery, you may connect your own 6 volt gel cell lead acid battery as shown in the diagram. It may have a capacity of up to 10 ampere hours. The battery will be kept charged by the product's internal circuitry.

The function of any such battery is to maintain operation of the product during failures of primary power. Each ampere hour of capacity will keep the product operational for approximately 6 hours depending on the number of alarm calls placed and other factors.

Optional External Battery Connection Diagram



E PROGRAMMING FOR USE WITH NUMERIC PAGERS

Numeric pager systems require the caller to dial the phone number of the pager service, wait for a prompting beep, and then enter some additional digits which are to be displayed on the receiving pager, and then finally, enter a pound(#) to complete the entry.

To call and cause a display on a numeric pager, your Guard-It™ autodialer will do essentially the same thing, except that it will wait for a delay period which you set, instead of listening for the pager system's beep, before sending the remaining digits.

This is all accomplished by programming an "extended" phone number, which includes a delay which you invoke by pressing the star (*) key.

To program this special "extended" phone number, after selecting which of the 8 phone numbers to program, key in the telephone number of the paging service, then press the star (*) key, then continue with the digits that you want to appear on the receiving pager, and finally press pound (#) when your entry is complete, then wait three seconds for the Guard-It™ autodialer to automatically accept and repeat back the extended phone number which you have entered.

In this special case after you have invoked a dialing delay by using the star (*) key, the Guard-It™ autodialer treats the pound (#) key in a special way. Normally, the pound (#) key is used to accept an entry or to return to a previous menu level. However once a delay has been invoked, *the star and pound keys are treated as "dialable" digit values for the remainder of this programmed phone number*. This allows for the desired result of including a # which will actually be "dialed" to complete the communication with the pager system.

For example, to display "12345" on a pager which can be "paged" by calling 555 1000, you would key in:

5 5 5 1 0 0 0 * 1 2 3 4 5 #

and then wait three seconds for the Guard-It™ autodialer to accept and recite back this extended phone number, which it will recite as:

5 5 5 1 0 0 0 "Delay 1 0 seconds" 1 2 3 4 5 "Pound".

(The stated number of delay seconds will be whatever Dialing Delay value is programmed—see below).

In a typical application, the Guard-It™ autodialer's own phone number would be the number to be programmed for display.

The other step you must take, is to place several calls to the pager system in order to determine by experiment how long a waiting time is suitable before the paging system will reliably have issued its prompting beep, so that it is definitely ready to accept the digits to be displayed. Begin the timing at the moment you dial the last digit of the pager service number, and end the timing when you hear the pager service's prompting beep. We suggest you add three seconds to the longest time period you observe. Use a regular telephone to place the calls.

Then program this delay value in seconds, as the Dialing Delay under the General Programming Menu. The default value is ten seconds, and this value will work for many pager systems without alteration.

With the extended phone number and Dialing Delay value fully programmed, it is best to verify (three times is suggested) that the Guard-It™ autodialer will successfully cause the pager to be reached with the intended display.

This is done by manipulating one of the signal inputs to cause an alarm.

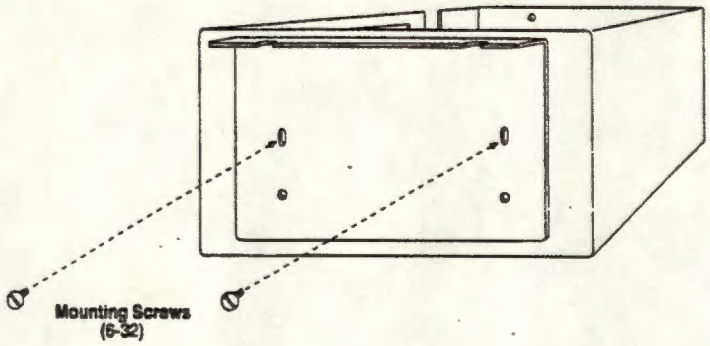
Note: Because pager systems issue a variety of special signaling tones, it is best to keep the Call Progress feature turned off if using pager systems.

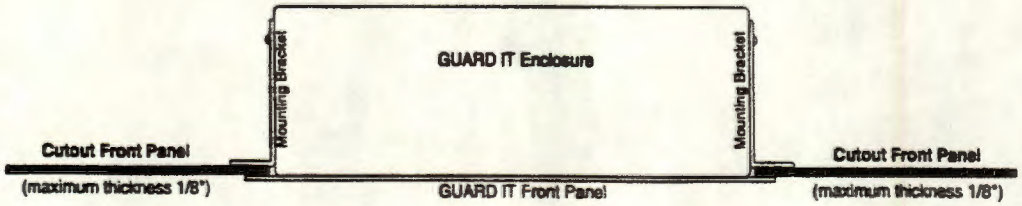
You can "eavesdrop" on the progress of the test calls using a programming phone, as long as Call Progress is turned off. Do not pick up the programming phone until the dialing begins.

F

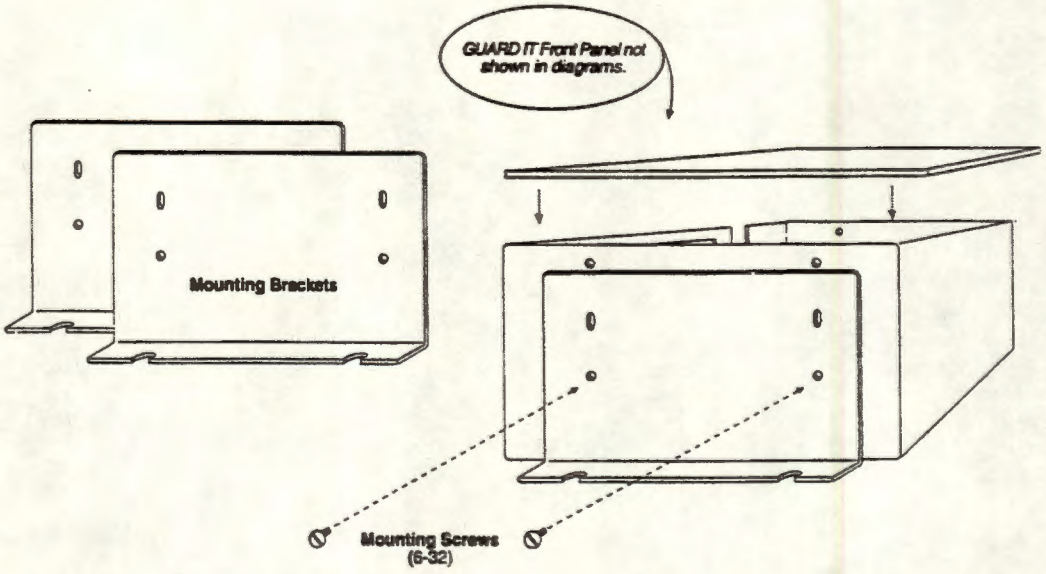
ENCLOSURE MECHANICALS & WIRING DIAGRAMS

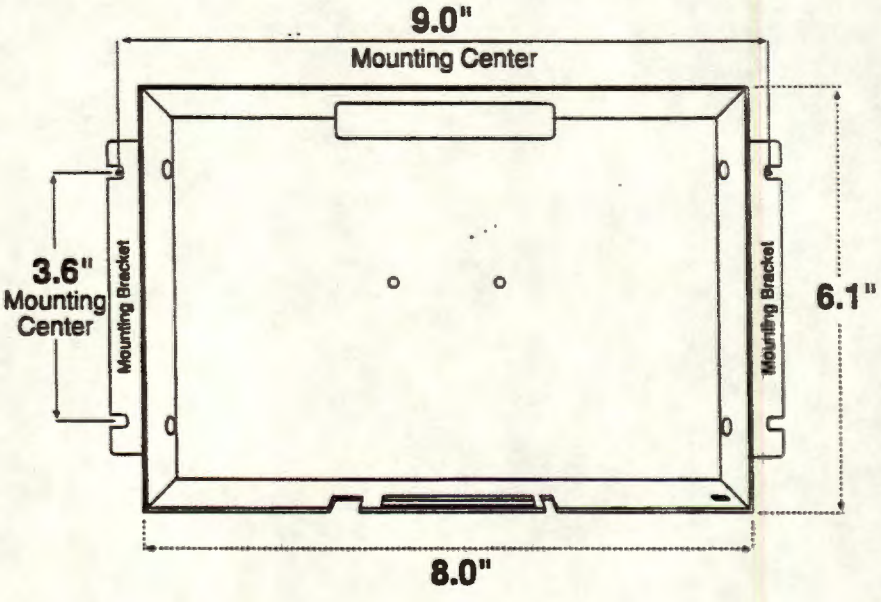
Mounting the Guard-It™ Autodialer Enclosure Flush into a Front Panel



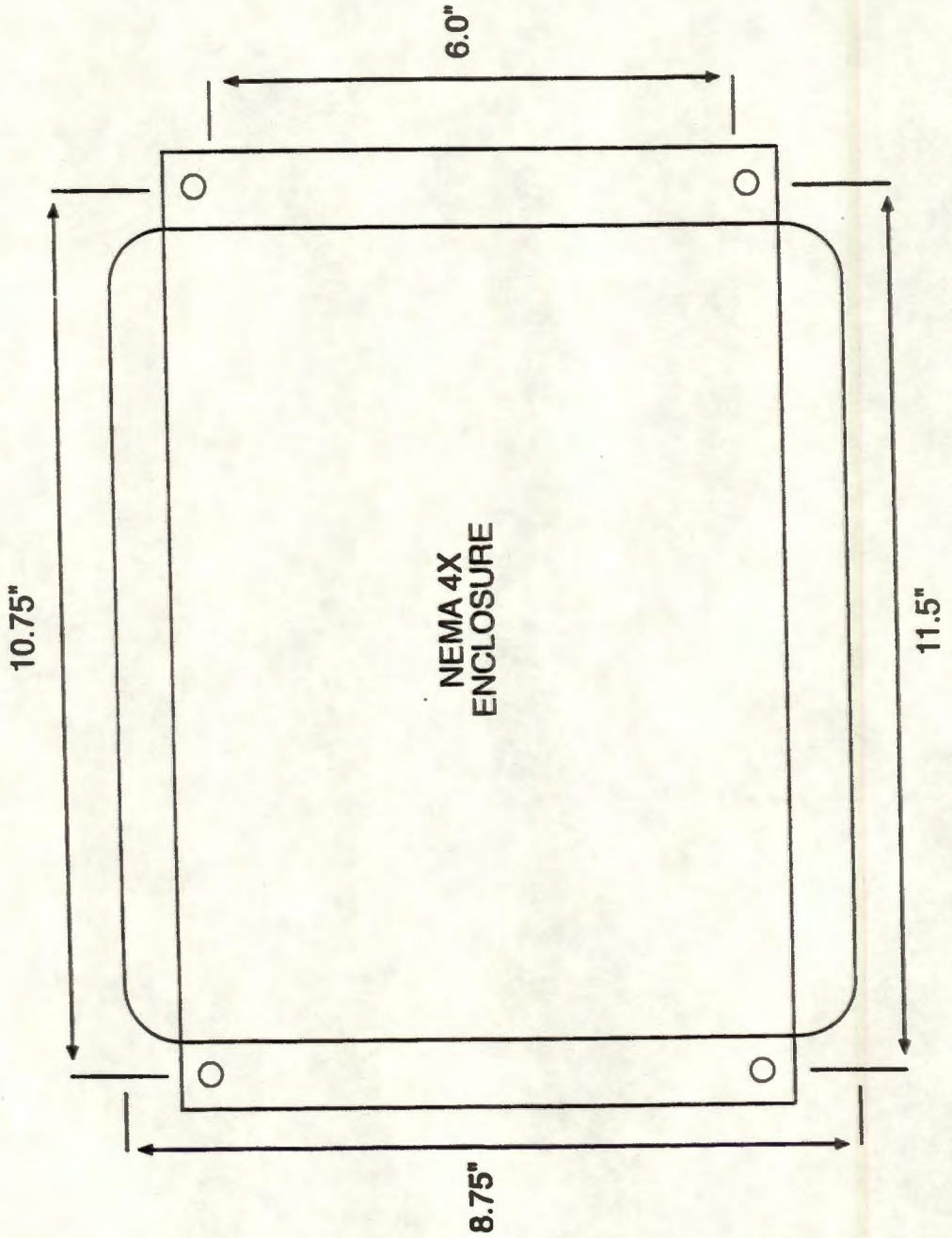


Mounting the Guard-It™ Autodialer Enclosure onto a Back Surface

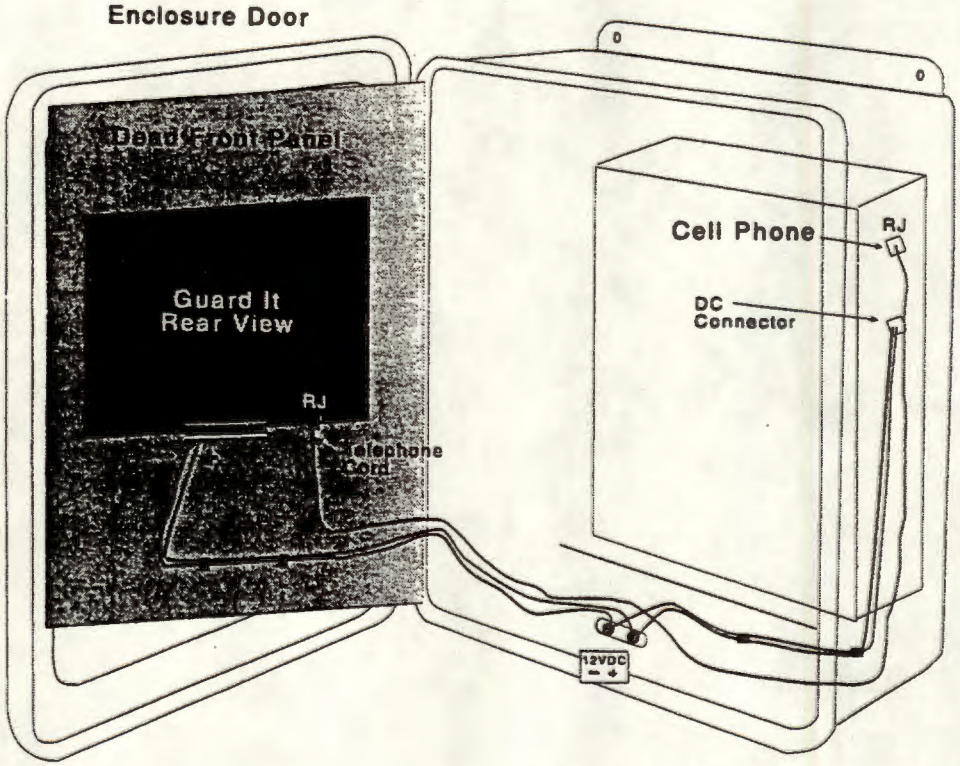




Guard-It™ NEMA4X Enclosure



Guard-It™/Cellularm™ Wiring Diagram



FCC Notice to Users

FCC Requirements

1. The Federal Communications Commission (FCC) has established Rules which permit this device to be directly connected to the telephone network. Standardized jacks are used for these connections. This equipment should not be used on party lines or coin phones.

2. If this device is malfunctioning, it may also be causing harm to the telephone network; this device should be disconnected until the source of the problem can be determined and until repair has been made. If this is not done, the telephone company may temporarily disconnect service.

3. The telephone company may make changes in its technical operations and procedures; if such changes affect the compatibility or use of this device, the telephone company is required to give adequate notice of the changes. You will be advised of your right to file a complaint with the FCC.

4. If the telephone company requests information on what equipment is connected to their lines, inform them of:

   a. The telephone number to which this unit is connected.
   b. The Ringer Equivalence Number. [0.8B]
   c. The USOC jack required. [RJ11C]
   d. The FCC Registration Number. [EMRUSA-30496-AL-E]

Items (b) and (d) are indicated on the label. The Ringer Equivalence Number (REN) is used to determine how many devices can be connected to your telephone line. In most areas, the sum of REN's of all devices on any one line should no exceed five (5.0). If too many devices are attached, they may not ring properly.

Service Requirements

In the event of equipment malfunction, all repairs should be performed by our Company or an authorized agent. It is the responsibility of users requiring service to report the need for service to our Company or to one of our authorized agents. Service can be obtained at **Raco Manufacturing & Engineering Company, 1400 62nd Street, Emeryville, California, 94608; (510) 658-6713.**

D-8

OTHER ELECTRICAL AND MISCELLANEOUS COMPONENTS

59871

ELECTRICAL CERTIFICATE

COMMONWEALTH ELECTRICAL INSPECTION SERVICE, INC.

176 DOE RUN ROAD, MANHEIM, PA 17545

TELEPHONE (717) 664-2347

January 09, 2001
APPL. #999

PREMISES OF H.H. DOBBINS INC as PUMP
Address: 99 WEST AVENUE, LYNDONVILLE NY
County of ORLEANS

Installed by: MARCOR ENVIRONMENTAL

Apparatus: 100 AMP OH SERVICE

Inspected by: ROBIN ROBINSON

The conditions following governed issuance of this certificate, and any certificate previously issued is cancelled. Failure to have the property reinspected when additional equipment or wiring is added; or within one year from date of the certificate shall void the certificate in its entirety and the company shall not be liable for any damages whatsoever;

This certificate does not guarantee efficiency, wearing qualities, maintenance or repair and the company shall not be liable for any damages resulting from any defect or fault in the plans or specifications, including repair, reconstruction personal injury or for the death of any person; and

This certificate only covers visual inspection of wiring and does not cover manufacture or use of wiring.

Inspectors of this Company shall have the privilege of making inspections at any time, and if its rules are violated, the Company shall have the right to revoke the certificate.

WALLPACKS

YARD BLASTER

Mercury Vapor or High Pressure Sodium
Photocell Controlled Dusk-to-Dawn Yard

ht.

Attention Rob Yager
MARCOR 247-6852

Thank You
Bill Miller
Graybar
Electric.

Heavy duty Photocontrol swivels to face desired direction

Precision die cast aluminum housing with durable epoxy powder coat paint

Mounting arm available

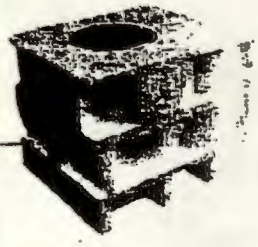
Hydroformed aluminum reflector for maximum light output

Porcelain 4kv pulse rated socket with spring loaded contacts

Long life lamp included

One piece acrylic refractor

Shipped in highly protective molded styrofoam packaging



Packaging has product features, ballast and lamp specifications plus lighting layout photometrics and installation instructions

Product Information

Mercury Vapor
Lamp supplied with fixture

High Pressure Sodium
Lamp supplied with fixture

Accessories

Watts	Lamp Type	Lamp Base	Ballast	Starting Amps / Operating Amps 120V	Input Watts	Lamp ANSI	Initial Lumens	Lamp Hours
175	ED28	Mogul	R-NPF 120V	1.8 / 1.9	215	H39	7,900	24,000
70	ED17	Medium	R-NPF 120V	2.1 / 1.6	86	S62	6,300	24,000
150	ED17	Medium	R-NPF 120V	4.6 / 3.2	170	S55	16,000	24,000

Mounting Arm:
24" curved steel arm with gray epoxy powder paint. Includes all mounting hardware.

Specifications

UL Listing:
Suitable for wet locations

Housing:
Precision die cast aluminum with gray epoxy powder finish.

Refractor:
Acrylic

Reflector:
Hydroformed aluminum

Finish:
Standard finish is chip and fade resistant, silver gray epoxy powder coating

Socket:
Porcelain 4kv Pulse Rated with spring loaded center contact

Product info by Fax 24 / 7
Call RAB Fax Back at 888 722-1236.
Enter document numbers shown below:

	Catalog Page	Installation Manual
YARDBLASTER	240	249

For more info on RAB FaxBack see p.98.

Product info on the Internet:
www.rabweb.com, click "support"

Photometrics

175W Mercury Vapor @ 12' Mounting Height

Mounting Height	Multiplier	HPS Watts	Multiplier
8'	2.3	70	.8
12'	1.0	150	2.0
16'	.6		
20'	.4		
24'	.3		

RAB TEL 888 RAB 1000
FAX 888 RAB 1232

Yard Blaster

175 watt Mercury Vapor or 70 watt HPS models. Photocell controlled for automatic Dusk-to-Dawn operation. Die cast aluminum housing with silver gray epoxy powder coat paint. Mounting arm available. Lamp included.

Finish: ● Silver Gray

Yard Blaster 150W HPS *New!*

150 watt High Pressure Sodium model. Photocell controlled for automatic Dusk-to-Dawn operation. Die cast aluminum housing with silver gray epoxy powder coat paint. Mounting arm available. Lamp included.

Finish: ● Silver Gray

Delivery

OFFER CAT #

YLM175

Includes lamp

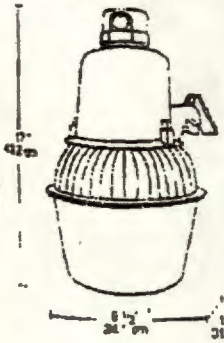
YARM24 - ARM

Economical dusk to dawn lighting you can use just about anywhere.

Catalog Numbers

Lamp Hours			Replacement Lamps	Replacement Ballasts	Replacement Photocontrol
24,000	YLM175		LMV175	BYM175	PCYB
24,000	YLS70	YLS150	LHPS70	BYHPS70	PCYB
24,000	YARM24	YARM24	LHPS150	BYHPS150	PCYB

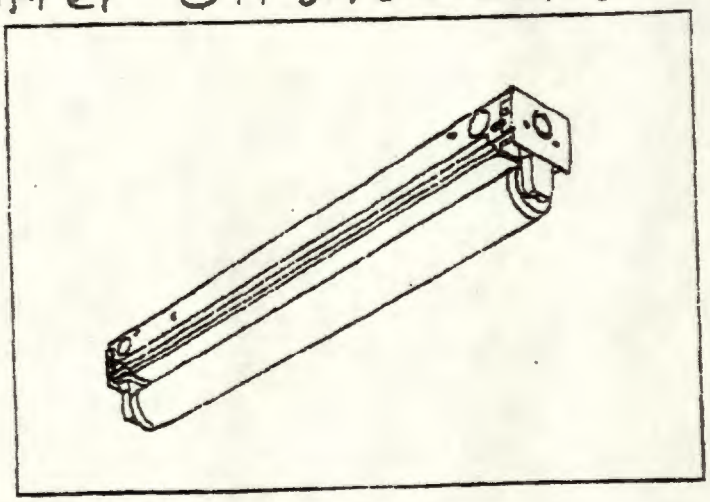
Dimensions



TEL 888 RAB 1000
FAX 888 RAB 1232

RAB

Offer CH2 1 2 U L 1 0 U



Stock
Rochester

CH1.5-1
CH2-1

ONE LAMP CHANNEL
PRE-HEAT - TRIGGER START

Type: _____

Job Description: _____

FEATURES:

- Available 18" or 24".
- Heavy die formed steel channel.
- Snap-on cover. No tools required. No hardware to lose.
- Rotary lock lampholders for positive lamp contact.
- Pre-heat fixtures have starters.
- Channel ends double as joiners.
- Individual or row mounting. Surface or suspended.

SPECIFICATIONS:

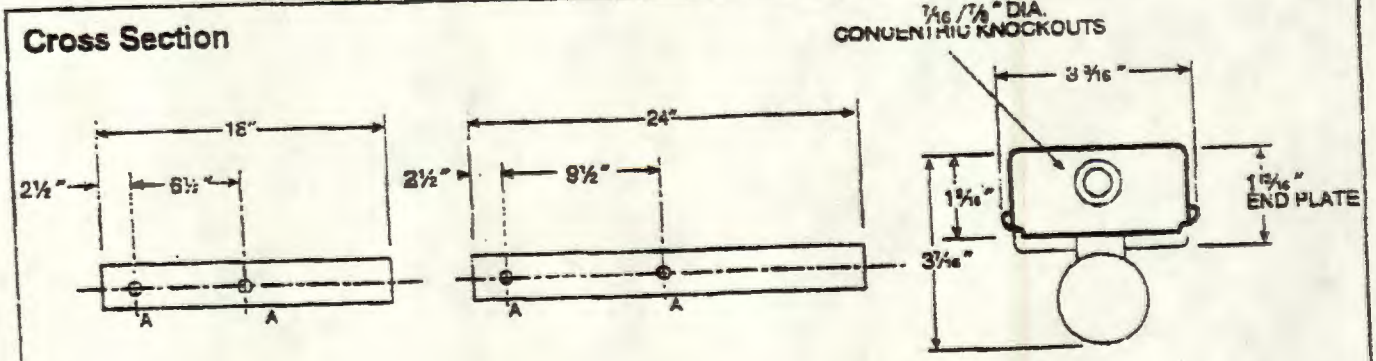
Ballasts
15 and 20 watt ballasts are Trigger Start, low power factor, Class P, U.L. listed. 15 and 20 watt Pre-Heat ballasts are low power factor, core and coil, U.L. listed. 17 watt T8 ballasts are high power factor.

Housing
Die formed steel.

Finish
All parts pre-painted with high gloss baked white enamel, minimum reflectance 86%, applied over iron phosphate pre-treatment for maximum adhesion and rust resistance.

Labels
All fixtures carry the U.L. label. (CSA approval available. Use Suffix "CSA").

Cross Section



A - 7/8" Diameter Knockout
Note: All dimensions are in inches; dimensions are subject to change without notice. Please consult factory or check sample for verification.

Mounting Data

ITB4

Accessory Reflectors

CHRA2

CHR2

3808 North Sullivan Rd. • Spokane, WA 99216 • (509) 924-7000

Columbic

Photometric Report No 11349

Columbia

Environmental Laboratories

REPORT # 11349
DATE: 2/15/96

LUMINAIRE: CH2-L20

24" 1 2-3/16" SINGLE LAMP INSTANT START HIGH POWER FACTOR STRIP
BALLAST: MH-1P20; LAMP: F20T12; BAL. FAC.: .75; WATTS: 26
LAMPS RATED AT 1240 LUMENS EACH
LUMINOUS AREA: 24 x 3.17

REFLECTANCE: INT: .80
S/MW: PARL 1.25 NORM 1.65

ZONAL SUMMARY

ZONE	LUMENS	LAMP	FIXT
0-30	140.	11.3	12.1
0-40	240.	19.4	20.7
0-60	488.	39.3	42.0
0-90	857.	68.7	73.5
90-120	233.	20.4	21.7
90-130	290.	23.4	24.9
90-150	310.	25.0	26.7
90-180	310.	25.0	26.7
0-180	1162.	93.7	100.0

LER = FS- 34

This photometric test was performed using a generic ballast / lamp combination. Extrapolation of these data for other ballast / lamp combinations may produce erroneous results. The ballast factor must be applied to the lumen output rating assigned to the lamp(s) in the combination values shown.

Luminaire efficacy rating (LER) per NEMA LE5-1993.

TESTED BY: RK APPROVED BY:

TEST RUN IN ACCORDANCE TO CURRENT I.E.S. PUBLISHED PROCEDURES

Coefficients of Utilization

Coefficients of Utilization
Zonal Cavity Method — Floor Reflectance - .20

RC	80				70				50			0
RW	70	50	30	10	70	50	30	10	50	30	10	0
1	83	87	82	78	86	83	78	74	74	70	67	51
2	83	74	66	60	78	70	63	57	63	57	52	40
3	75	64	56	49	71	61	53	47	54	48	43	32
4	68	56	47	40	64	53	45	39	48	41	35	26
5	62	49	40	33	58	46	38	32	42	35	29	21
6	57	43	35	28	53	41	33	27	37	30	25	18
7	52	39	30	24	49	37	29	23	33	26	21	15
8	48	35	26	21	45	33	25	20	30	23	18	13
9	44	31	23	18	42	30	22	17	27	20	16	11
10	41	28	21	15	39	27	20	15	24	18	14	9

Energy Data

LER: FS-34 **Energy Cost: $7.06***
Input Watts: 26 **BF: .75**

The above energy calculations were conducted using a specific lamp/ballast combination. Actual results may vary depending upon the lamp and ballast used. Lamp and ballast specifications are subject to change without notice.

*Comparative annual lighting energy cost per 1000 lumens based on 3000 hours and $0.08 per KWH.

Ordering Information

Example: CH2-120-L120-GLR

CH ___ - **1** ___ - ___ ___ - ___ - ___ - ___

Series
CH

Size
1.5 - 18" (1.5')
2 - 2' (24")

No. of Lamps in Cross Section
1 - One

Lamp Type
15 - 18", T12, 15 Watt
17 - 2', T8, 17 Watt
20 - 2', T12, 20 Watt

Ballast
Blank - High Power Factor
PH - Low Power Factor Pre-Heat
L - Low Power Factor, Trigger Start
OCT - Magnetic T8 Octron
For a specific ballast vendor, show as option.

Voltage
120 - 120V
277 - 277V
347 - 347V

Channel Options
GLR - Fast Blow Fuse
GMF - Slow Blow Fuse
CSA - Approved, Canadian Standards Association
PAF - Paint After Fabrication

Channel Accessories
Order Seperately
ITB4 - Hanger for close mounting on a Tee Bar Ceiling
CHRA2 - 2' Asymmetric Reflector
CHR2 - 2' Symmetric Reflector
CS2 - Maintains 1-1/2" space when mounted to outlet box.
CHWG2 - 2' Wire Guard

For complete list of options and accessories, see options and accessories section.

KRPA, KRP, KA, KR series

5 to 10 Amp
General Purpose Relay


KRPA


KRP


KA

File E29244, E22575, E81558 (KR Hermetic)
File LR15734

Features

- Industry standard octal-type termination for quick installation.
- Contact arrangements from 1 Form A (SPST - NO) to 3 Form C (3PDT).
- Indicator lamp and push-to-test options available on certain models.
- The KRPA series is the automated manufactured version of the KRP series.
- Hermetically sealed option available with KR UL recognized for Class I Div. 2 Hazardous locations, Groups A, B, C, D.

Contact Data @ 25°C

Arrangements: See Ordering Information Table.
Materials: Silver or silver-cadmium oxide, with or without gold flashing.
Expected Life: 10 million operations min., mechanical; 100,000 operations min. @ rated loads.

KA, KRP, KRPA **UL/CSA Contact Ratings @ 25°C (Except KR)**

Contact Code	Arrangement	Contact Rating
Y&L (Silver)	1, 2, 3 Poles	5A @ 120VAC 3A @ 240VAC 1/10HP @ 120VAC 1/6HP @ 240VAC
G&N (Silver-Cad. Oxide)	1, 2, 3 Poles	10A @ 240VAC 1/2 HP @ 240VAC 1/3HP @ 120VAC

KRP, KRPA **Factory Ratings**

Contact Code	Arrangement	Contact Rating
Y&L	1, 2, 3 Poles	5A @ 28VDC, 120VAC, 80% PF
G&N	1, 2, 3 Poles	10A @ 28VDC, 120VAC, 80% PF 6A @ 250VAC

KA UL Contact Ratings

Contact Code	Series	Contact Ratings
Y	KA[1]	5A @ 120VAC, 3A @ 240VAC, 1/10 HP @ 120VAC, 1/6 HP @ 240VAC
G	KA[2]	10A @ 120VAC, 6A @ 240VAC 1/6 HP @ 120VAC, 1/3 HP @ 240VAC

[1]Listed by C.S.A. for 5A @ 120VAC 80% PF
[2]Listed by C.S.A. for 10A @ 120VAC 80% PF

Initial Dielectric Strength

Between Open Contacts: 500V rms.
Between All Elements: 1,500V rms.

Note: See KRPA, KRP, KA, KR-E Ordering Information table on page 106.

Coil Data @ 25°C

		Nominal Power	Maximum Power
KRP	AC	2VA	Open Models - 5VA Enclosed Models - 4VA
KRPA	DC	1.2W	Open Models - 4W Enclosed Models - 3W
KA	AC	2VA	Open Models - 4VA
	DC	125mW per movable arm	Open Models - 4W

Duty Cycle: Continuous.
Initial Insulation Resistance: KRP, KRPA - 1000 Megohms, min.
KA - 100 Megohms, min.

Coil Data @ 25°C

	Nominal Voltage	DC Resistance (Ω) ±10%	Nominal Coil Current (mA)
DC Coils	6	32	188
	12	120	100
	24	472	51
	48	1,800	26.6
	110	10,000	11.5
	220	Use 110V relay with 10,000 Ω 5W Resistor in series	
AC Coils	6	6	335
	12	24	168
	24	85	84
	120	2,250	17.5
	240	9,110	8.75

Operate Data @ 25°C

Must-Operate Voltage:
DC: 75% or less of nominal voltage.
AC: 85% or less of nominal voltage.
Operate Time (Excluding Bounce):
15 milliseconds typical @ nominal voltage.
Release Time (Excluding Bounce):
10 milliseconds typical @ nominal voltage.

Environmental Data

Temperature Range:
Open Models: **AC:** -45°C to +70°C.
DC: -45°C to +85°C.
Enclosed Models: **AC:** -45°C to +55°C.
DC: -45°C to +70°C.

Mechanical Data

Open Models: Solder terminals.
Enclosed Models: Octal-type plug.
Enclosures: Transparent polycarbonate (except KR).
Hermetically sealed metal case available with KR only.
Weight: **KA:** 1.7 oz. (48.2g) approximately.
KRPA, KRP: 3.0 oz. (85g) approximately.

Ordering Information

Typical Part No. ▶ KRPA -5 A Y -120

1. Series:
KRPA (Newer version, enclosed)
KRP (Older version, enclosed)
KR (Hermetically sealed option 'E' only)
KA (Open style)

2. Contact Arrangement:
1 = 1 Form A (SPST-NO)
2 = 1 Form B (SPST-NC)
3 = 1 Form X (SPST-NO-DM)
4 = 1 Form Y (SPST-NC-DB)
5 = 1 Form C (SPDT)
6 = 1 Form Z (SPDT[DB-DM])
7 = 2 Form A (DPST-NO)
8 = 2 Form B (DPST-NC)
11 = 2 Form C (DPDT)
12 = 3 Form A (3PST-NO)
13 = 3 Form B (3PST-NC)
14 = 3 Form C (3PDT)

3. Coil Input:
A = AC, 50/60 Hz.
D = DC
DS = Diode Suppression (DC coil only)

4. Contact Rating and Indicator Lamp Option:

TYPE	KRPA	KRP	KR	KA
Codes Available	Y, G, L, N, YF, GF, LF, NF	Y, G, N, YF, GF, NF	Y, G, GF	Y, G,

Leave Blank = Silver, no indicator lamp for hermetically sealed KR (option E below).
Y = Silver, no indicator lamp
G = Silver-cadmium oxide, no indicator lamp
L = Silver, with indicator lamp*
N = Silver-cadmium oxide, with indicator lamp*
YF = Silver gold-flashed, no indicator lamp
GF = Silver-cadmium oxide gold-flashed, no indicator lamp
LF = Silver gold-flashed contacts, with indictor lamp*
NF = Silver-cadmium oxide gold-flashed contacts, with indicator lamp*

5. Options:
Leave Blank = No options (except KR).
P = Push-to-test button (KRPA only).
E = Hermetically Sealed Option (KR only).

6. Coil Voltage:
Up to 277VAC
Up to 125VDC

*Indicator Lamp not available on 25-90V coils. Only 120-240VAC and 110VDC models are UL recognized and CSA certified.

Stock Items – The following items are normally maintained in stock for immediate delivery.

KA-5AG-120
KA-5AY-120
KA-5DG-6
KA-5DG-12
KA-5DG-110
KA-11AG-120
KA-11AY-6
KA-11AY-24
KA-11AY-120
KA-11DG-12
KA-11DG-24
KA-11DG-110
KA-14AG-120
KA-14AY-120
KA-14DG-24
KA-14DG-110
KR-11AE-120
KR-11AGE-120
KR-11DE-24
KR-11DGE-12
KR-11DGE-24
KR-14AGE-120
KR-14DGE-24
KRP-5AG-120
KRP-11AG-24
KRP-11AG-120
KRP-11AG-240
KRP-11AN-24
KRP-11AN-120
KRP-11AY-120
KRP-11DG-12
KRP-11DG-24
KRP-11DG-48
KRP-11DG-110
KRP-11DG-125
KRP-11DN-12
KRP-11DN-24
KRP-11DY-24
KRP-14AG-120
KRP-14AG-240
KRP-14AN-120
KRP-14AY-120
KRP-14DG-12
KRP-14DG-24
KRP-14DG-110
KRP-14DN-24
KRPA-5AG-24
KRPA-5AG-120
KRPA-5AY-120
KRPA-5DG-6
KRPA-5DG-12
KRPA-5DG-24
KRPA-5DY-12
KRPA-5DY-24
KRPA-11AG-6
KRPA-11AG-12
KRPA-11AG-24
KRPA-11AG-120
KRPA-11AG-240
KRPA-11AN-12
KRPA-11AN-24
KRPA-11AN-120
KRPA-11AN-240
KRPA-11AY-6
KRPA-11AY-12
KRPA-11AY-24
KRPA-11AY-120
KRPA-11AY-240
KRPA-11DG-6
KRPA-11DG-12
KRPA-11DG-24
KRPA-11DG-48
KRPA-11DG-110
KRPA-11DN-12
KRPA-11DN-24
KRPA-11DN-110
KRPA-11DY-12
KRPA-11DY-24
KRPA-14AG-12
KRPA-14AG-24
KRPA-14AG-120
KRPA-14AG-240
KRPA-14AN-24
KRPA-14AN-120
KRPA-14AN-240
KRPA-14AY-24
KRPA-14AY-120
KRPA-14AY-240
KRPA-14DG-12
KRPA-14DG-24
KRPA-14DG-48
KRPA-14DG-110
KRPA-14DN-24
KRPA-14DY-24

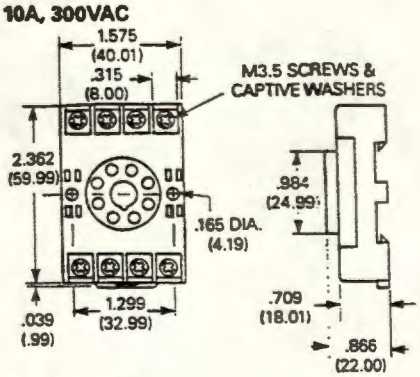
Sockets For KRP, KRPA Series Relays

The following sockets are normally maintained in stock for immediate delivery.

Screw Terminal, DIN Rail Snap-Mount Sockets

Use with mounting track 24A110)

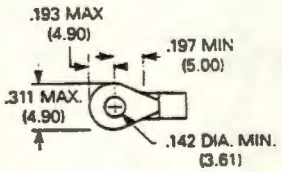
27E891
10A, 300VAC



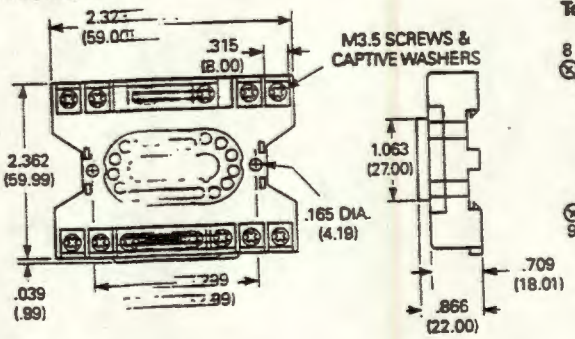
Terminal Location

Top View

Terminal Size

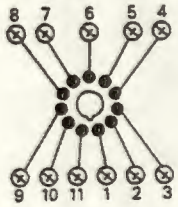


27E892
10A, 300VAC

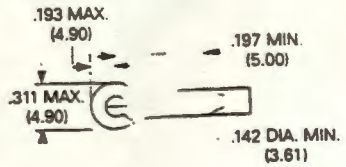


Terminal Location

Top View



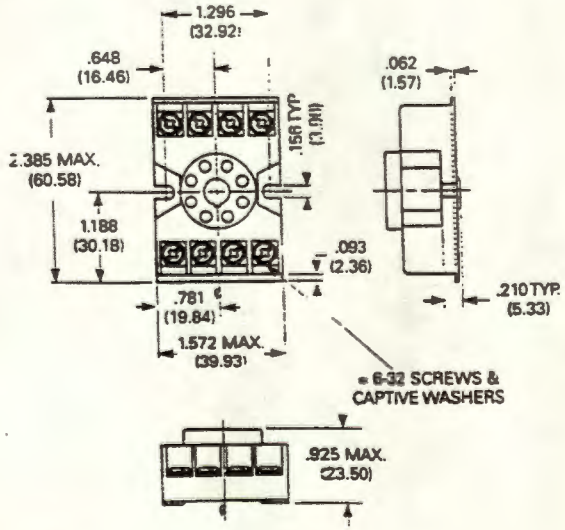
Terminal Size



Sockets have M3.5 screw terminals which accept up to two #12 AWG wires. Rated 10 amps @ 300VAC and meets UL 94V-0. Socket shipped with two 20C317 anchor clips.

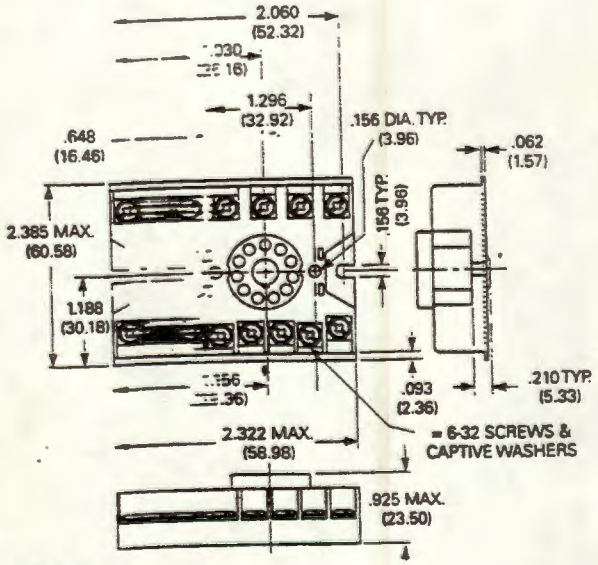
Screw Terminal Sockets

27E122
10A, 300VAC
8-pin

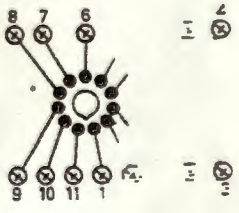


Terminal Location

27E123
10A, 300VAC
11-pin

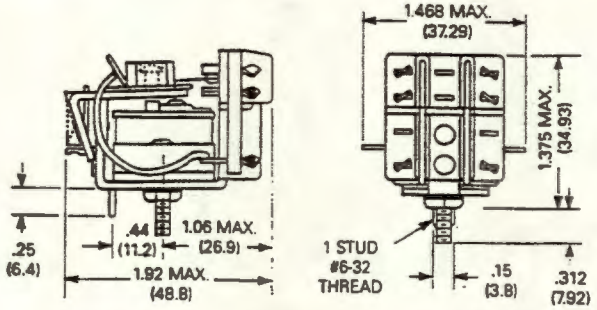


Terminal Location



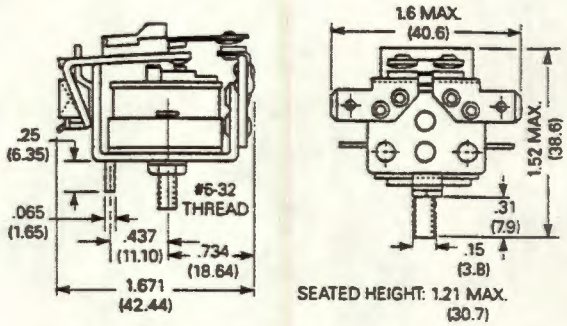
Outline Dimensions

KA Series



Tolerances on .XX Decimals ± .02 (± .5) Unless Otherwise Specified
Tolerances on .XXX Decimals ± .005 (± .13) Unless Otherwise Specified

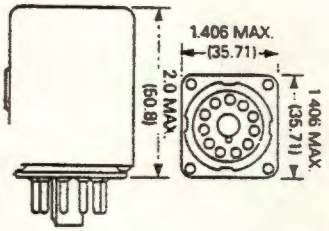
KR3-H



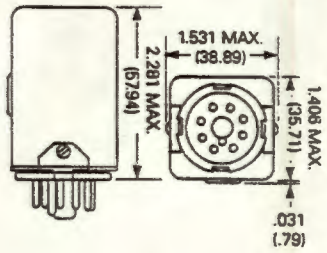
KR Series Enclosures

Type "P" Clear Dust Cover

For KRPA and KRP



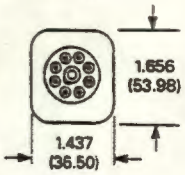
For KRP3-H



Hermetically Sealed Enclosure
(KR only)

Height: 2.125" (53.98mm) max.

Octal Plug



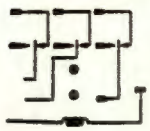
Hold-Down Spring

20C176 KRPA & KRP
20C206 KAP and KRP3

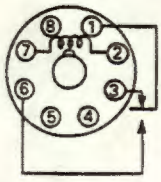
Durable stainless steel spring can be moved aside for relay removal or installation. Mounts with same machine screws or rivets that secure socket to chassis. Two .156" (3.96mm) dia. holes required.

Wiring Diagrams (Bottom Views)

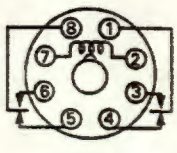
KA



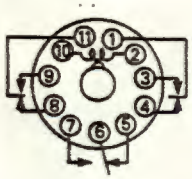
KR5
KAP5
KRP5
KRPA5



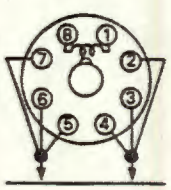
KR11
KAP11
KRP11
KRPA11



KR14*
KAP14
KRP14
KRPA14



KRP3AH



NC =

*The hermetically sealed KR14 has pins 5 and 6 reversed.

SQUARE D SP3650 SECONDARY SURGE ARRESTER

INSTALLATION INSTRUCTION SHEET

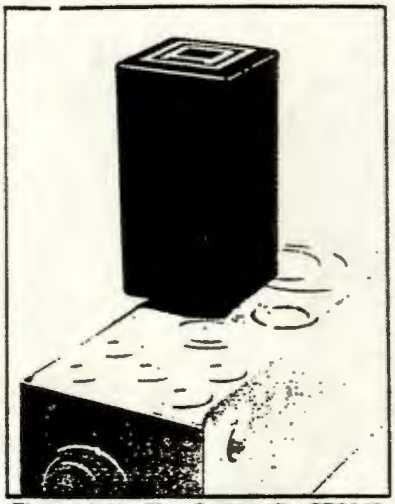


Figure 1. The Square D SP3650 Surge Arrester mounted on service panel through 1/2 inch knockout hole.

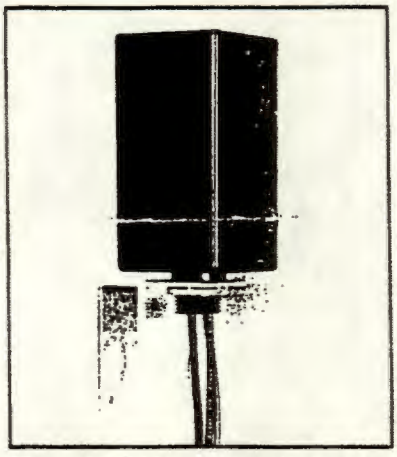


Figure 2. Optional bracket mounting for Square D SP3650 Surge Arrester.

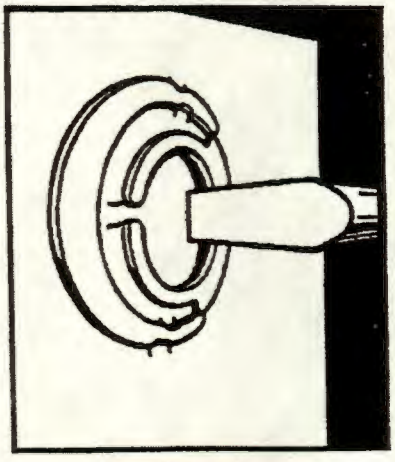


Figure 3

The Square D SP3650 Secondary Surge Arrester is designed for surge protection of single phase or three-phase grounded electrical services up to 650 VAC. When properly installed as described in the following instructions, the SP3650 arrester will afford protection against surge-related damage to secondary distribution wiring systems.

TOOLS / MATERIALS / EQUIPMENT REQUIRED FOR INSTALLATION:

Screwdriver	-	standard blade & tip 1/4" x 0.037"
	-	standard blade & tip 3/8" x 0.062"
Pump pliers	-	1 3/4"
Cutting pliers	-	10 AWG
Voltage tester	-	650 VAC, UL Listed, CSA Certified
Screws	-	Quantity 2, appropriate to mounting surface

WARNING: SHOCK and ENERGY HAZARDS are present! Turn off power before installation or removal of this arrester. Square D recommends that the arrester be installed by a qualified electrician. Incorrectly installing the unit may make it ineffective. Careless or inexperienced installers are likely to come into contact with hazardous voltage and should not attempt installation of this product.

INSTALLATION:

1) Turn power off.

2) Remove the load center cover panel using large screwdriver (save screws).

3) Verify power is off using an approved AC voltage tester per its operating instructions.

4) Select installation site realizing that shorter leads means better protection.

5a) If you are installing the arrester **using the provided bracket**, remove the rubberband, tie or tape bundling the SP3650 leads together, straighten the leads and unscrew the nut on the arrester threads and remove it. Insert the arrester wires through the large hole in the mounting bracket, positioning the bracket on the arrester threads. Put the nut over the arrester wires and slide up onto the threads and hand-tighten. Holding the arrester in one hand, tighten the nut securely using pliers. Position the arrester and bracket in the mounting location you have selected, installing the mounting screws through the bracket into the housing holes and tighten to secure the arrester and bracket to the housing.

5b) If you are installing the arrester **without a bracket**, remove the enclosure knockout in the mounting location you have selected by driving the center knockout inward (see Figure 3) using the large blade and tip screwdriver, then alternately push or pry the knockout outward then drive it inward until it breaks

Continued on reverse

SQUARE D SP3650 SECONDARY SURGE ARRESTER
INSTALLATION INSTRUCTION SHEET

INSTALLATION (cont'd.)

free (discard knockout). Remove the rubberband, tie or tape bundling the SP3650 leads together, straighten the leads and unscrew the nut on the arrester threads and remove it. Insert the arrester wires through the knockout hole in the housing being careful not to damage the wire insulation. Put the nut over the arrester wires and slide up onto the threads and hand-tighten. Holding the arrester with one hand, tighten the nut securely using pliers.

6) Position the white wire as desired, cut to length with cutting pliers and then strip the insulation back 1/2". Insert the exposed conductor into the ground terminal and tighten securely with the small screwdriver.

7) Referencing the wiring diagrams below, position the black wires in turn as desired, cut to length and strip back the insulation 1/2". Insert the exposed conductor into the appropriate phase terminal and tighten securely with the small screwdriver; repeat for the second and third black wire.

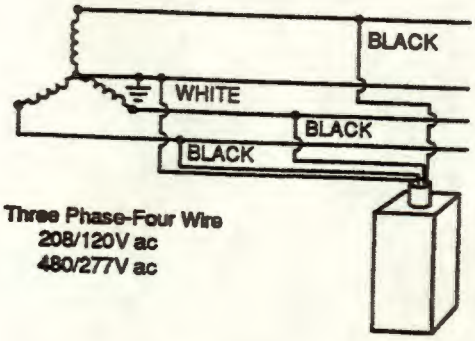
8) Inspect installation.

9) Replace the load center cover panel using the large screwdriver and the screws from Step 2.

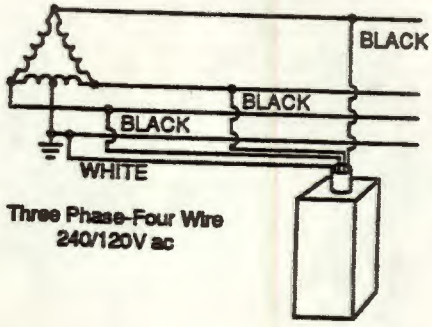
10) Turn power on.

NOTE: Secondary surge arresters do not prevent lightning strokes to the building or lines on which they are installed. They are not intended as replacements for lightning rods or other grounding/shielding devices. Nearby direct lightning strokes may exceed the unit's capacity and cause damage. Be sure to obtain permission from your local electric utility before installing this unit outdoors on the utility side of the watt-hour meter. Also, make sure to follow the local electrical codes. Make certain that the ground circuit is solidly grounded to water pipes, adjacent ground, lightning rods, etc.

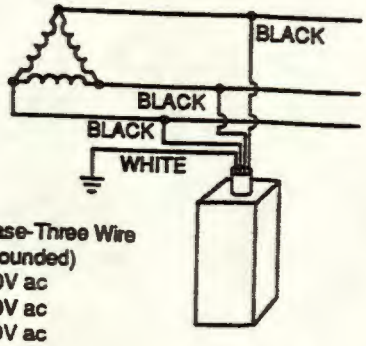
WIRING DIAGRAMS



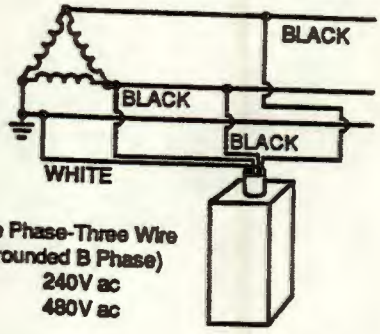
Three Phase-Four Wire
208/120V ac
480/277V ac



Three Phase-Four Wire
240/120V ac



Three Phase-Three Wire
(Ungrounded)
240V ac
480V ac
600V ac



Three Phase-Three Wire
(Grounded B Phase)
240V ac
480V ac

PITTSBURGH CORNING
FOAMGLAS
INSULATION
800 Presque Isle Drive
Pittsburgh, Pennsylvania 15239-2799
Tel.: 724/327-6100 • 800/359-8433
Fax: 724/327-5590
www.foamglasinsulation.com

PITTWRAP® JACKETING
PRODUCT DATA SHEET

IMPORTANT: MATERIAL SAFETY DATA SHEETS ARE AVAILABLE AND SHOULD BE READ BEFORE USING THIS PRODUCT.

DESCRIPTION:
PITTWRAP® jacketing is a heat sealable, multiply laminate for protecting underground FOAMGLAS® insulation systems with outer surface temperatures below 190°F.

PITTWRAP® jacketing consists of three layers of a polymer modified bituminous compound separated by glass fabric reinforcement and aluminum foil. An outer layer of polyester film is laminated to the bituminous compound. A release paper prevents sticking in the roll before use.

*TYPICAL PROPERTIES:

Color:	Black
Thickness, mils, (mm):	125 (3)
Weight/ft², lbs, (kg/m²):	0.66-.69 (3.2-3.4)
Width, inches, (cm):	23 3/8 (59.4)
Roll Length, ft, (m):	50 (15.24)
Sq.Ft/Roll, (m²):	100 (9.3)
Roll Weight, lbs, (kg):	66-69 (29.9-31.3)
Tensile Strength, lbs/in:	@ 78°F, 105 @ 20°F, 165
Application Temperature, min °F, (°C):	20 (-7)
Service Temperature, °F: (°C):	20 to 190 (-7 to 88)
Butt Strips:	
Width, inches, (cm):	4 (10.2)
Roll Length, ft, (m):	50 (15.24)
Permeability, ASTM E96, Perm inches:	0.002
Perms @ 125mils:	0.02

RESISTANCE:

Water:	good
Alkalies:	good
Acids:	good
Petroleum Solvents:	poor
Fire:	combustible

This is a guide. Since conditions vary, consult Pittsburgh Corning if in doubt about chemical resistance.

MATERIAL APPLICATION:
Store PITTWRAP® jacketing in a cool area out of direct sun in hot weather. In cold weather, store in warm area prior to use to facilitate application.

APPLICATION:
PITTWRAP® jacketing may be shop or field-applied. In both cases, a cigarette-wrap application is used around FOAMGLAS® insulation with butt strips over the end joints. (See back page).

All underground insulation systems must be designed with proper engineering details to control expansion/contraction, anchoring, etc. A qualified engineer should be consulted for design.

FITTINGS OR CHANGES IN THICKNESS:
With any jacketing or coating, any change in insulation thickness, such as screwed ell covers, pipe stepdowns, etc., should be field-tapered to make a smooth transition. Fittings may be covered with jacketing cut in shapes to fit, or with PITTCOTE® 300 finish (FI-120) and PC® Fabric 79 (FI-159). When finish is used, stop the last full section of jacketing 4" (10cm) short of the change in thickness or beginning of curvature. The polyethylene film on the PITTWRAP® jacketing must be flashed off a minimum of 2". Over the bituminous surface, apply a tack coat of PITTCOTE® 300 finish 2-3 gallons/100ft² (0.8-1.2 l/m²) and embed PC® Fabric 79 , lapping jacketing a minimum of 2" (5cm). After one hour, apply a second coat of finish 2-3 gallons/100ft² and a second layer of fabric. Apply a top coat of finish 2-3 gallons/100ft² so that no fabric is visible when dry. Total wet thickness should be 1/4" minimum. If backfilling takes place less than 24 hours after PITTWRAP® 300 finish is applied, roofing felt shall be placed over the coating.

The second and succeeding sections are placed in the same matter, tightly butting the edges. All longitudinal joints should be started on the same line to facilitate later placement of butt strips.

LIMITATIONS:
DO NOT use over combustible insulations or install where open flames are not permitted.

Do not use above ground without a metal jacket.

Do not use in areas where jacketing will be exposed to temperatures in excess of 190°F (88°C)

Do not use where jacketing will be exposed to solvents that will dissolve asphalt.

Observe practical precautions when backfilling so not to puncture jacket.

This material is designed for application only for professional, trained personnel using proper equipment and is not intended for sale to the general public.

STORAGE:
Store in a heated area for cold weather application.

SHIPPING:
DOT Hazard Class: None

Material Safety Data Sheet

Section I - Product Identification

Manufacturer/Supplier:
Pittsburgh Corning Corporation
800 Presque Isle Drive
Pittsburgh, PA 15239

Information Number: 724/327-6100

Product Name: PITTWRAP® Jacketing

Generic Name: Modified Bitumen Membrane

CAS Number: N. AP. **CAS Name:** N. AP.

NFPA HAZARD CLASS: Health: 1 Fire: 1 Reactivity: 1

WHMIS CLASSIFICATION: CLASS D Division 2A

Use: PITTWRAP® jacketing is a heat-sealable, muti-ply laminate for protecting underground FOAMGLAS® insulation systems with outer surface temperatures below 190° F.

Section II - Hazardous Ingredients

Ingredient	CAS Number	% by Vol.	ACGIH* TLV	OSHA** PEL	OSHA STEL	OSHA CEILING	NTP*** IARC OSHA Reg.
Asphalt	8052-42-4	89	5 mg/m^3 (fumes)	5 mg/m^3 TWA	N. AV.	N. AV.	Yes
Heavy Parafinic Oil	64742-04-7	7	0.2 mg/m^3 8 hr. TWA	N. AV	N. AV.	N. AV.	Yes

Comment: N. AV. - Not Available
N. AP. - Not Applicable

* American Conference of Governmental Industrial Hygienists.
** OSHA 29 CFR 1910.1000
*** Dangerous Properties of Industrial Materials, 7th Ed. by Sax/Lewis.
See Section VI - Toxicological and First Aid Information of this MSDS.

Section III - Physical Data

-Physical State at 77°F (25°C):	Solid	-Freezing Point:	N. AP.
-Boiling Point:	N. AP.	-Melting Point:	243°F ± 18°F (117°C ± 10°C)
-Vapor Pressure (mm of Mercury):	Negligible	-Specific Gravity (Water = 1):	0.9964
-Vapor Density (Air = 1):	Negligible	-Percent Volatile (By Volume):	Negligible
-Solubility in Water:	Insoluble	-Evaporation Rate (Butyl Acetate = 1):	Negligible
-Appearance and Odor:	Black multi-ply laminate with a clear top film.	-Evaporation Rate (Ethyl Ether = 1):	Negligible
-Odor Threshold:	Negligible	-pH:	N. AP.
-Coefficient of Water/Oil Distribution:	N. AV.		

Section IV - Fire and Explosion Hazard Data

Conditions of Flammability: Combustible when exposed to heat or flame.

Flash Point: >600°F **Flammable Limits:** (Percent by Volume) **LEL:** N. AP. **UEL:** N. AP.

Auto Ignition Temperature: 905°F (485°C) **Extinguishing Media:** Water fog, dry carbon dioxide or foam.

Special Fire Fighting Procedures: Use foam, carbon dioxide, or dry chemical for asphalt fires. Do not use water except as fog. Self-contained breathing apparatus operated in pressure demand or other positive pressure mode is required for fire fighting personnel.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None expected.

Hazardous Combustion Products: Asphalt fumes, carbon monoxide, carbon dioxide and various hydrocarbons.

Explosion Data: Sensitivity to mechanical impact: None. Sensitivity to static discharge: None.

Section V - Reactivity Data

Stability: Stable **Conditions to Avoid:** Store away from excessive heat and flame.

Incompatibility (Materials to Avoid): Strong oxidizing agents.

Hazardous Decomposition or Byproducts: Asphalt fumes, carbon monoxide, carbon dioxide, and various hydrocarbons during combustion.

Hazardous Polymerization: Will not occur. **Conditions to Avoid:** N. AP.

Section VI - Toxicological and First Aid Information

OSHA Permissible Exposure Level: See Section II. PEL of asphalt fumes is 5 mg/m^3.

Routes of Entry: Inhalation: Yes Skin: Yes Ingestion: Unlikely
Eye Contact: Unlikely

Effects of overexposure: Effects of overexposure to asphalt fumes if overheated or melted without adequate ventilation:

Acute: Inhalation - irritation, coughing and nausea.

Eyes - contact is unlikely. Fumes may cause irritation.

Skin - burns or irritation.

Ingestion - Highly unlikely. Hot material can cause burns or irritation.

Chronic: This product is classified by the International Agency for Research on Cancer (IARC) as Group 3, inadequate human evidence. Skin contact, breathing of mists, fumes, or vapors should be reduced to avoid any ill effects.

Section VI - Toxicological and First Aid Information con't

Medical conditions generally aggravated by exposure to asphalt fumes: None known.

Other Toxicological Properties: None known.

Emergency and First Aid procedures:

Eyes: Flush with potable water for 15 minutes, do not rub or apply pressure. Consult physician or emergency medical service.

Skin: Should molten material strike the skin, flush with cold water. Do not forcibly remove material adhering to the skin. Throughly wash exposed area with mineral oil and then flush with water.

Inhalation: Remove victim to fresh air. Treat symptomatically and consult physician if irritation/symptoms persist.

Ingestion: Do not induce vomiting. Consult physician, emergency medical service or poison center.

Section VII - Precautions For Safe Handling and Use

Steps to be taken in case material is released or spilled: Solid material will not leak or spill. If molten, dike and allow to cool and solidify. Shovel material into containers for disposal.

Waste Disposal Method: Dispose of in approved landfill in accordance with all local, state and federal regulations.

Precautions to be taken in handling and storing: Store in a cool area for combustibles. Use precautions when using torch.

Other Precautions: Keep out of reach of children. For professional use only. Not for sale to or use by the general public.

Section VIII - Personnel Protection Information

Eye Protection: Safety glasses with sideshields or goggles recommended.

Skin Protection: Normal work clothing covering arms and legs. Flame resistant gloves when fusing.

Respiratory Protection: None normally required. Organic vapor respirator (3M #17-674) if excess fumes are present.

Ventilation: None normally required. If heating, sufficient ventilation is required to maintain exposure level below the TLV of 5mg/m^3.

Other Protective Clothing or Equipment: None.

Work/Hygienic Practices: Use good housekeeping and hygiene practices.

Section IX - Shipping Information

DOT Hazard Class: None.

Proper Shipping Name: Modified Bitumen Membrane.

UN # N. AV.

Section X - Preparation Information

Prepared by: H. J. Patrick

Date of Revision: 3/8/99

Mechanical Applications
FOAMGLAS® Insulation
Properties, Certification, & Specifications

Certifications* and Approvals
FOAMGLAS® Insulation can be certified to conform to the requirements of:

- ASTM C 552 "Specification for Cellular Glass Thermal Insulation"
- Canadian Standard CAN/CGSB51.38M
- Military Specification MIL-I-24244C, "Insulation Materials, Thermal, with Special Corrosion and Chloride Requirement"
- Nuclear Regulatory Guide 1.36, ASTM C 795, C 692, C 871
- Flame Spread 5, Smoke Developed 0 (UL 723, ASTM E 84), R2844; also classified by UL of Canada, CR1957
- ISO 9002
- Through-Penetration Firestop Systems UL 1479 System Nos. CAJ5060, CAJ5069, CAJ5071 and System Nos. WL5038, WL5045, WL5046, WL5051, WL5067, WJ5011, WJ5015
- Board of Steamship Inspection (Canada) Certificate of Approval No. 100/F1-98
- General Services Administration, PBS (PCD): 15250, Public Building Service Guide Specification, "Thermal Insulation (Mechanical)"
- New York City Dept. of Bldgs., MEA #138-81-M FOAMGLAS® Insulation for piping, equipment, walls and ceilings
- New York State Uniform Fire Prevention and Building Code Dept. of State (DOS) 07200-890201-2013
- City of Los Angeles General Approval RR22534

FOAMGLAS® Insulation is identified by Federal Supply Code for Manufacturers (FSCM 08869)
*Written request for certificate of compliance must accompany order.

Physical and Thermal Properties of FOAMGLAS® Insulation

Physical Properties	USA	Metric	SI	ASTM Test
Absorption of moisture (% by volume)	0.2% Only moisture retained is that adhering to surface cells after immersion.			C240
Water-vapor permeability	0.00 perm-in	0.00 perm-in		E96
Acid resistance	Impervious to common acids and their fumes, except hydrofluoric acid.			
Capillary	None	None	None	
Combustibility	Noncombustible, will not burn.			E136
Composition	Pure glass, totally inorganic, contains no binder.			
Compressive strength average for standard material	100 psi Strength, for flat surfaces capped with hot asphalt, different capping will give different values.	7.0 kg/cm^2	689 kPa	C165, C240, C552-91
Density, average	8 lb/ft^3	128 kg/m^3	128 kg/m^3	C303
Dimensional stability	Excellent – does not shrink, swell or warp			
Flexural strength, block average	80 psi	5.6 kg/cm^2	552 kPa	C203, C240

Hygroscopicity	No increase in weight at 90% relative humidity.			
Linear coefficient of thermal expansion (25 to 300°C)	4.9×10^{-6}/°F	8.8×10^{-6}/°K	8.8×10^{-6}/°K	E228
Maximum service temperature	+900°F	+482°C	755°K	
Modulus of elasticity, approximately	1.4×10^{5} psi	9,400 kg/cm^2	965 MPa	C623
Shear strength	No reliable recognized test method for determination of the shear strength for cellular glass exists at this time. Where shear strength is a design criterion, PCC should be contacted for recommendations.			
Thermal conductivity	Btu-in/hr·ft^2·°F 0.32 @ 75°F 0.31 @ 50°F	kcal/m·h·°C 0.037 @ 0°C 0.038 @ 10°C	W/mK 0.043 @ 0°C 0.044 @ 10°C	C177, C518
Specific heat	0.20 Btu/lb·°F	0.20 kcal/kg·°C	0.84 kJ/kg·°K	
Thermal diffusivity	0.017 ft^2/hr	0.0043 cm^2/sec	4.3×10^{-7} m^2/sec	

NOTE: Properties given at 75° F unless otherwise specified, Properties may vary with temperature.

Mechanical Specification Index

Specification #	Title - General	Rev/Date
I-H/C-89-02-01	Specification Guidelines for FOAMGLAS® Insulation	Rev. 9 / 12-10-98

Specification #	Title - Piping	Rev/Date
I-C-78-02-01	Specification for Application of FOAMGLAS® Insulation on Liquid Oxygen or Nitrogen Piping	Rev. 9 / 12-4-98
I-C-82-07-01	Application of FOAMGLAS® Insulation to Chilled Water Pipes	Rev. 4 / 8-29-96
I-H-82-11-01	Guidelines for Application of FOAMGLAS® Insulation to Heat Trace Piping	Rev. 4 / 9-19-96
I-S-83-07-01	Guidelines for Using FOAMGLAS® Insulation at Pipe Hangers and Supports	Rev. 8 / 2-5-99
I-H/C-86-09-01	Specification for Insulation of Piping systems for Freeze Protection and Process Control	Rev. 5 / 9-20-96
I-DB-89-02-02	Specification for FOAMGLAS® Insulation in Underground Direct Burial Applications	Rev. 5 / 12-7-98
I-U-GL-701	Specification for the Application of FOAMGLAS® Insulation in Shallow Trench, Vault, and Tunnel Applications	Rev. 3 / 6-2-98
I-P-ST-327	Specification for the Application of FOAMGLAS® Insulation to Above Ground Steam Piping	Rev. 2 / 2-25-98
I-P-LNG	Specification for the Application of FOAMGLAS® Insulation on Liquid Natural Gas Piping	Rev. 0 / 12-4-98
I-H-90-03-01	Specification for the Application of FOAMGLAS® Insulation to Stainless Steel Piping	Rev. 3 / 12-9-98
Specification #	Title - Special	Rev/Date
I-H-82-08-01	Application of FOAMGLAS® Insulation to Systems Utilizing Heat Transfer Fluids or Hot Oil	Rev. 6 / 10-11-96
A-88-11-01-01	Specification for Factory Application of PITTWRAP® Jacketings to FOAMGLAS® Insulation Pipe Cover	Rev. 4 / 9-20-96
I-H/C-90-01-02	Specification Guidelines for the Application of FOAMGLAS® Insulation to Spherical Vessels Using the Fully Adhered Method	Rev. 5 / 5-20-98
I-C-90-08-01	Insulation of Air Conditioning Ducts Using FOAMGLAS® Insulation	Rev. 3 / 9-20-96
I-P-EO-322	Guidelines for Application of	Rev. 4 / 4-16-98

	FOAMGLAS® Insulation to Ethylene Oxide Piping and Equipment for Fire Protection	
I-EO-93-04-02	Guidelines for the Application of FOAMGLAS® Insulation to Ethylene Oxide Piping and Equipment	Rev. 3 / 4-16-98
I-FP-1998	Specification Guidelines for FOAMGLAS® Insulation used in Fire Protection Applications for Piping, Tanks, and Vessels	Rev. 0 / 9-1-98
Specification #	Title: StrataFab System / ADVANTAGE® System	Rev/Date
I-SF-89-02-03	Specification Guidelines for the StrataFab® System Using FOAMGLAS® Insulation	Rev. 4 / 9-20-96
I-SF-90-07-02	Application of the StrataFab® System to Piping and Equipment Utilizing Heat Transfer Fluids	Rev. 4 / 9-20-96
Advantage® System	Specification Guidelines for the FOAMGLAS® Insulation Advantage® System	Rev. 1 / 11/13/97
Specification #	Title: Tanks	Rev/Date
I-H-77-04-02	Above Ambient Tank Insulation Application Specification	Rev. 5 / 12-1-97
I-C-79-07-01	Insulation of a Below Ambient Storage Vessel Using FOAMGLAS® Insulation	Rev. 5 / 9-19-96
I-H-81-06-01	Guidelines for Securing FOAMGLAS® Insulation to Roofs of Tanks Operating Above 70 F (21 C)	Rev. 4 / 2-12-98
I-H-84-12-02	Insulation of Hot Tanks Using Weld Pin Securement	Rev. 3 / 1-12-98
I-H-85-01-02	Specification for the Application of FOAMGLAS® Insulation to Caustic Liquid Storage Tanks up to 350 F (177 C)	Rev. 5 / 2-12-98
I-C-85-05-01	Specification for Application of FOAMGLAS® Insulation to Base and Shell of Refrigerated Liquid Storage Tanks	Rev. 5 / 9-25-97
I-H-85-09-01	Specification for Insulation of Hot Tank Bases Using FOAMGLAS® Insulation	Rev. 6 / 12-8-98
Specification #	Title: Cycli	Rev/Date
I-CYC-92-03-	Specification for the Application of	Rev. 2 / 2-25-97

01	FOAMGLAS® Insulation to Piping Cycling from -150 F to 700 F	
I-CYC-94-01-02	Specification for the Application of FOAMGLAS® Insulation to Cyclic Vessels Operating from -95 F to 350 F (-71 C to 177 C)	Rev. 1 / 12-1-97

Material Safety Data Sheet

Section I - Product Identification

Manufacturer/Supplier:
Pittsburgh Corning Corporation
800 Presque Isle Drive
Pittsburgh, PA 15239

Information Number: 724/327-6100

Product Name: FOAMGLAS® Insulation

Generic Name: Cellular Glass

CAS Number: N. AP.

CAS Name: N. AP.

NFPA HAZARD CLASS: Health: 0 Fire: 0 Reactivity: 0

WHMIS CLASSIFICATION: CLASS D Division 2B

Use: Insulation of tanks, spheres, piping, roofs and equipment

Section II - Hazardous Ingredients

Ingredient	CAS Number	% by Vol.	ACGIH* TLV	OSHA** PEL	OSHA** STEL	OSHA** CEILING	NTP*** IARC OSHA Reg.
Hydrogen Sulfide	7783-06-4	2-4	10 ppm	10 ppm TWA	15 ppm	N. AV.	No
Carbon Monoxide	630-08-0	3-10	25 ppm	35 ppm TWA	N. AV.	200 ppm	No
Glass Dust (PNOC)	N. AP.	Varies	10 mg/m^3	15 mg/m^3 5 mg/m^3 (respirable)	N. AV.	N. AV.	No

Comment: N. AV. - Not Available
N. AP. - Not Applicable
PNOC - Particulates Not Otherwise Classified

* American Conference of Governmental Industrial Hygienists.
** OSHA 29 CFR 1910.1000
*** Dangerous Properties of Industrial Materials, 9th Ed. by Sax/Lewis.
See Section VI - Toxicological and First Aid Information of this MSDS.

Section III - Physical Data

-Physical State at 77°F (25°C):	Solid		
-Boiling Point:	N. AP.	-Freezing Point:	N. AP.
-Vapor Pressure (mm of mercury):	N. AP.	-Melting Point:	1350°F (732°C)
-Vapor Density (Air = 1):	N. AP.	-Specific Gravity (Water = 1):	0.11-0.14
-Solubility in Water:	Insoluble	-Percent Volatile (By Volume):	N. AP.
-Appearance and Odor:	Black cellular material, no odor unless cut or crushed	-Evaporation Rate (Butyl Acetate = 1):	N. AP.
-Odor Threshold:	0.002 ppm	-Evaporation Rate (Ethyl Ether = 1):	N. AP.
-Coefficient of Water/Oil Distribution:	N. AP.	-pH:	N. AP.

Section IV Fire and Explosion Hazard Data

Flash Point: N. AP. **Flammable Limits: (percent by volume)** **LEL:** N. AP. **UEL:** N. AP.

Auto Ignition Temperature: N. AP. **Extinguishing Media:** Water, dry chemical or carbon dioxide

Special Fire Fighting Procedures: N. AP.

UNUSUAL FIRE AND EXPLOSION HAZARDS: May release hydrogen sulfide and carbon monoxide gas when involved in a fire. The small amounts of hydrogen sulfide and carbon monoxide released are not expected to contribute to the intensity of a fire.

Hazardous Combustion Products: Hydrogen sulfide, carbon monoxide and various hydrocarbons

Explosion Data: Sensitivity to mechanical impact: N. AP.
Sensitivity to static discharge: N. AP.

Section V - Reactivity Data

Stability: Stable **Conditions to Avoid:** N. AP.

Incompatibility (materials to avoid): N. AP.

Hazardous Decomposition or Byproducts: None

Hazardous Polymerization: Will not occur **Conditions to Avoid:** N. AP.

Section VI - Toxicological and First Aid Information

HYDROGEN SULFIDE

OSHA Permissible Exposure Level: See Section II. PEL for hydrogen sulfide may be reached if 1 cubic ft of material is crushed in a closed space of 3000 cubic ft.

Routes of Entry: Inhalation: Yes Skin: No Ingestion: Unlikely
Eye Contact: Yes

Effects of Overexposure: Effects of overexposure to hydrogen sulfide gas when cells are broken without adequate ventilation:

Acute: Inhalation - headache, nausea, and difficult breathing, dizziness.

The sense of smell may be fatigued over time. The odor and irritating effects do not offer dependable warning to workers who maybe exposed to gradually increasing amounts and therefore become used to it.

Eyes - irritation and inflammation of the mucous membrane, tearing, sensitivity to light.

Chronic: Chronic poisoning results in headache, inflammation of the eyelids and the mucous membrane that lines the inner surface of the eyelids, digestive disturbances, weight loss and general weakness.

Medical Conditions Generally Aggravated by Exposure to Hydrogen Sulfide: Pre-existing upper respiratory and lung diseases such as, but not limited to bronchitis, emphysema and asthma, pulmonary heart disease or eye problems.

Section VI - Toxicological and First Aid Information con't

GLASS PARTICLES

Routes of Entry: Inhalation: Yes Skin: No Ingestion: Yes
Eye Contact: Yes

Effects of Exposure to Glass Particles:

Skin - irritation or abrasion from glass particles.
Ingestion - possible abrasion of mouth and throat from glass particles.

Other Toxicological Properties: None known

Emergency and First Aid Procedures:

Eyes: Flush with potable water for 15 minutes, do not rub or apply pressure. Consult physician or emergency medical service.

Skin: Wash thoroughly without pressure. If irritation persists or skin is broken, consult physician.

Inhalation: Remove victim to fresh air, apply artificial respiration if needed. Call poison center, physician or emergency medical service giving CAS names and numbers of gases.

Ingestion: Do not induce vomiting. Consult physician, emergency medical service or poison center.

Section VII - Precautions For Safe Handling and Use

Steps to be Taken In Case Material is Released or Spilled: Collect in sift-proof containers. Avoid generation of dust.

Waste Disposal Method: Dispose of in approved landfill in accordance with all local, state and federal regulations.

Precautions to be Taken in Handling and Storing: Avoid generation of dust. If storing for long periods, protect insulation from weather.

Other Precautions: None

Section VIII - Personnel Protection Information

Eye Protection: Goggles for dust protection while cutting or abrading in wind or overhead work.

Skin Protection: Gloves - rubber impregnated canvas - for abrasion protection. Normal work clothes including long-sleeved shirt.

Respiratory Protection: Use nuisance dust mask when cutting or abrading with adequate ventilation (6 air/changes per hour). Supplied air or self-contained breathing apparatus in poorly ventilated areas is required when crushing of FOAMGLAS® insulation causes PEL of hydrogen sulfide and carbon monoxide gases to be exceeded.

Ventilation: Use local exhaust when cutting. Use mechanical ventilation when crushing large volumes.

Other Protective Clothing or Equipment: None

Work/Hygienic Practices: Use good housekeeping and hygiene practices.

Section IX - Shipping Information

DOT Hazard Class: None

Proper Shipping Name: Cellular Glass

UN #: N. AV.

Section X - Preparation Information

Prepared by: H. J. Patrick

Date of Revision: 2/1/00

While the information and recommendations set forth herein are believed to be accurate, Pittsburgh Corning Corporation makes no warranty with respect thereto, and disclaims all liability from reliance thereon.