WORK PLAN

Pelican Manufacturing Inc.
Jamestown, New York

Prepared By:

CRA Services
2055 Niagara Falls Boulevard
Niagara Falls, NY 14304

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Jamestown, New York

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CRA SERVICES

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1.0 INTRODUCTION

The Pelican Site (Site) is located in the City of Jamestown, Chautauqua County, New York. In 1987, Pelican executed an Order on Consent with the New York State Department of Environmental Conservation (NYSDEC) and retained Ecology and Environment (E&E) to perform a site investigation. This is documented in the 1988 report entitled "Pelican Manufacturing, Inc. Final Report" in compliance with their Order on Consent. In 1992, Dunn Geoscience Engineering Co., P.C. (Dunn) now Rust Environment & Infrastructure (Rust) was retained by the NYSDEC to conduct a remedial investigation (RI) of the Site. The selected remedial alternatives for the Site were identified in the Record of Decision (ROD) issued by the NYSDEC in March 1995 and include:

1. Construction and installation of remediation systems for the Pelican Manufacturing, Inc. Site. The remediation systems include:

   - Soil Vapor Extraction Wells;
   - Dual Phase Extraction Wells;
   - Soil Vapor Extraction System;
   - Groundwater Treatment System;
   - Effluent Discharge Outfall;
   - Optional Soil Vapor and Off-gas Treatment System; and
   - Treatment Building.

   Extracted groundwater will be treated with a non-fouling diffuser style air stripper followed by a filtration system inorganics removal step prior to discharge to surface water. The extracted soil vapor and air stripper off-gas will be treated, if necessary, to meet NYSDEC discharge requirements. The off-gas treatment, if used, will consist of vapor phase carbon treatment.

2. Removal and off-site disposal of contaminated sediments in the floor drains beneath the building and in the septic tank. Water removed from the septic tank or generated during removal of contaminated sediments will be stored in on-site storage tanks or tanker trailers of sufficient volume as necessary. Once the Treatment Facility is fully operational, this water will be treated on-site and discharged to the stream running west of the Site.

3. Decommissioning and removal of the soil vapor extraction and groundwater systems and associated treatment equipment upon meeting Site soil and

groundwater cleanup goals. As part of this work, the Site will be restored to as close to its preconstruction condition as possible.

In October 1997, Rust prepared and submitted the engineering design report Pelican Manufacturing Site to the NYSDEC under the state superfund standby program (work assignment D002520--35). The NYSDEC approved the design report on November 18, 1997. This work plan has been prepared by CRA Services for Rust to present the framework for construction activities to be implemented during the remedial action.

The Pelican Site is located on the west side of Washington Street, northwest of the intersection of Washington Street and 23rd Street. The Site is bordered on the north and south by other commercial or light manufacturing businesses. A portion of the former Jamestown City Landfill (now Chadakoin Park) borders the Site to the west. The Site consists of approximately 1.3 acres of land including a 10,000 square foot building complex.

The Site from Washington Street to the break in slope at the rear (west) of the building is comprised of miscellaneous fill material. A drainage swale exists from the base of the fill slope and directs surface water flow to the south and west. A Site plan is provided on Figure 1.

2.0 REMEDIAL CONSTRUCTION AND INSTALLATION

2.1 BASIS FOR DESIGN

The construction/installation of the remedial system for the Pelican Site is based on the Remedial Design Report, Pelican Manufacturing Site #9-07-010 Work Assignment #D002520-35 prepared by Rust Environment and Infrastructure on October 21, 1997. The following remedial actions will be conducted in the areas of concern:

i) soil vapor extraction in the vadose zone soils;
ii) groundwater extraction to treat contaminated water and lower the water table to expose more soils for soil vapor extraction treatment; and
iii) removal of contaminated sediments from the floor drain and septic tank of the building.

2.2 SITE PREPARATION

The following activities shall be performed to prepare the Site for construction activities:

1. Spotting of Site construction trailer, temporary Site office trailer, and portable sanitary facilities (Figure 1). Utilities, office equipment, personal hygiene and first aid equipment will be installed/provided per the contract specification.

2. Installation of perimeter Site fencing to secure the Site from unauthorized access (Figure 1). Site fencing will be installed to NYSDOT specifications.

3. Clearing and grubbing of the area to be remediated including relocation and staging of small and large Site debris (Figure 1). As a minimum materials will be segregated as follows:

    - brush and wood;
    - concrete/bricks;
    - metals; and
    - potentially hazardous materials

4. Bracing of roof in Building #2223 (Figure 1). The deflected roof beam in the building area where sediment removal and vapor extraction well installation activities will be performed will be braced with timbers to prevent further

deflection or sagging during remedial activities. Details of brace construction shown on Figure 2.

5. Access to Buildings 2221 and 2219 1/2 will be limited to construction procedures only.

6. Area used for decontamination of equipment, staging/storing of material and waste is shown on Figure 1. Details of decontamination pad is shown on Figure 3. Decontamination pad will be constructed of 4" x 4" wood frame on top of a sand bed. Attached to the frame shall be a 20 mil liner covered by a 4 mil sheet (for ease of disposal). The north end of the pad shall have a slight slope to facilitate sumping/removal of liquids.

7. Access road on southwest side of Site will be cleared and maintained as necessary to facilitate construction progress.

8. Prior to any intrusive work, all underground utilities will be located. Call for underground locates at telephone number 800-962-7962.

2.2.1 ON-SITE EQUIPMENT

The power equipment or equivalent to be used on-Site consists of:

- bulldozer (TD8);
- backhoe (JD310D);
- portable generator (3.5 KW);
- transfer pump (2.5 horsepower submersible);
- miscellaneous power hand tools;
- drill rig (Canterract 3C truck mounted with auger rig);
- 5,000 psi sewer jet (Zanda 500 psi pressure washer equipped with sewer jet self propelled nozzle);
- vacuum truck (CISCO Turbo Vac Vacuum Tanker); and
- crane (10 ton).

All equipment will be maintained in proper working order and will have all factory installed guards and safety devices in place and operational.

2.3 CONSTRUCTION

Site construction will be conducted in two phases during the project. During the first phase all Site preparation work and earthwork including well installation, trenching, piping, clay cap, treatment system pad, and surface restoration will be completed.

The second phase will include treatment system trailer installation, final office trailer location, utility hookups, and system startup. Proposed equipment layout of treatment trailer is provided on Figure 4. Vendor supplied shop drawings with details of the materials, fabrication, installation and operation of the trailer enclosed treatment system will be presented under separate cover.

2.3.1 SOIL VAPOR EXTRACTION SYSTEM

The SVE system will consist of 16 SVE-only wells and 5 dual-phase wells, collection piping, and SVE equipment. The SVE equipment shall come assembled in a treatment equipment trailer and shall consist of a Gast R7100 R-50 regenerative blower with a 40 gallon air/water separator, a mist/particulate filter, and necessary instrumentation and controls. Details of the SVE system are presented in engineering flowsheets, Figures 5 and 6.

2.3.1.1 SVE WELL INSTALLATION PROCEDURES

Sixteen SVE wells shall be constructed of 4-inch diameter Schedule 40 PVC with a 0.010 slot screen that will vary in length from 3 feet to 15 feet depending on location. Final construction details will be verified in the field and approved by Rust.

1. All wells shall be installed by a New York State licensed well installer. A Rust representative will be present during drilling activities to identify geologic formations and maintain complete and current well logs and daily notes.

2. The well shall be drilled using approximately 10-inch diameter hollow stem augers with continuous split spoon sampling performed at each well location.

3. Once the borehole for the well has been advanced to the desired depth, it shall be cleaned to remove any debris at the bottom of the hole.

4. The anticipated screened intervals for the SVE wells are listed in Table 1. The sand filter pack shall extend from the bottom of the well to 12-inches above screen. On top of the filter pack a minimum 1-foot thick cement/bentonite grout seal will be placed.

5. The remainder of the borehole will be backfilled with native material and finished with a concrete surface collar.

6. Well stickups will be installed with threaded caps and 1/4-inch PVC sample ports and extend approximately two feet above ground.

7. Every effort shall be made to assure plumbness and concentration of the well within the borehole.

8. Drill cuttings will be placed on plastic sheeting, covered, and then backfilled in trenches prior to installation of clay cap.

9. Well installation inside Building 2223 will be as follows:

   - concrete core with 12-inch bit;
   - using steel casing in conjunction with CISCO Turbo Vac;
   - remove subsurface sediment inside casing;
   - wells will be installed inside casing then casing will be jacked out.

10. SVE wells shall be numbered using a stencil and paint on the stickup or well cover.

A typical SVE well is shown on Figure 1.

2.3.1.2 SVE PIPING

The soil vapor collection piping shall be installed below grade to convey air from the SVE wells to the treatment equipment trailer. The SVE piping shall be installed approximately 2 1/2 feet to 4 feet below final grade and bedded in sand or approved backfill with surface restoration to match existing conditions. All piping is to be placed above the existing water table. The SVE collection piping shall be constructed of 2-inch diameter HDPE connected to a 2-inch diameter Schedule 40 PVC header in the treatment trailer using Fernco couplings. The exception to this is for SVE wells 18 through 21 inside the Pelican building where 2-inch PVC collection piping will be installed above

grade, heat traced, and insulated. Pipe runs will be secured to with strapping and supported by 4-inch pressure treated lumber. Trench/piping layout and trench section details are provided in Figures 9 and 10, respectively. During pipe testing piping shall be capped off at both ends and the line will be charged with city water to approximately 30 psi. The joints will then be checked for soapy water for leaks. Repairs will be made as necessary.

Piping will be placed in trenches, upon acceptance of pressure testing and backfilled as soon as possible. In the event of an impending storm the pipe runs shall be marked and complete trench backfilled.

2.3.2 GROUNDWATER COLLECTION AND TREATMENT (GWCT)

The GWCT system shall consist of five dual groundwater/SVE wells, groundwater collection piping, an air stripper package, sand filter system, effluent tank, and effluent discharge piping. The GWCT system shall be enclosed in the same enclosed treatment equipment trailer as the SVE system. Details of the GWCT system are presented in engineering flowsheets, Figures 6, 7 and 8. The following sections briefly describe the major components of the GWCT system.

2.3.2.1 DUAL GROUNDWATER/SVE WELL INSTALLATION

Five dual groundwater/SVE wells shall be constructed of 4-inch Schedule 40 PVC and installed in accordance with the same specifications and procedures as the SVE wells, with the following additions and modifications.

1. The dual phase wells will be screened deeper than the SVE wells to the approximate elevations indicated in Table 1.

2. The dual phase wells will be developed by surge block method, pumping, or a combination of both until the water is relatively free from suspended particulate matter. Development water will be stored in a frac tank and processed through the groundwater treatment system once in operation.

3. A groundwater extraction pump, Grundfos Model 7S03-8 will be installed approximately 0.5 to 1.0 feet above the well bottom. The steel riser pipe from the pump will be connected to the collection piping via a pitless adapter installed in the well casing wall.

4. The well head assembly will be installed below grade and protected by a 12-inch diameter well box with a bolted cover. The well head will consist of a 4-inch compression plug with a 1/4-inch sample port, 2-inch access cleanout plug, and sealed bushing for the pump electrical cable.

A typical dual phase extraction well is shown on Figure 1.

2.3.2.2 GROUNDWATER COLLECTION PIPING

The groundwater collection piping shall be installed below grade to convey water from the dual groundwater/SVE wells to the treatment equipment trailer. Subsurface piping shall consist of 1 1/2-inch diameter HDPE below grade and change to 1 1/2 inch Schedule 40 PVC upon entry into the treatment trailer. The HDPE piping shall be connected using a solvent welded barb fitting with a worm screw clamp. The HDPE piping shall be installed to approximately 4 feet below final grade to protect against freezing. The piping shall be bedded in sand or approved backfill compacted in one foot lifts with the surface restoration to match existing conditions. All trenches will be backfilled as soon as possible to minimize the length of open trench at any given time.

2.3.2.3 AIR STRIPPER

The Carbtrol air stripper package shall include a 7.5 horsepower, 800 cfm air stripper blower and a 50 Gallons Per Minute (GPM) PVC air stripper tank Model MSD8-100.

2.3.2.4 SAND FILTER SYSTEM

The sand filter system shall consist of a 1,600 gallon Feed Tank by Terracon Model #CXF-1600 with spray nozzle; a Feed and Recycle Pump, Goulds Model #NPE-GROUP 2ST rated at 60 GPM at 50 feet of head; a Diamond Sand Filter Vessel Model #V124-5.0 rated at 100 PSIG/140°F; a Diamond Series Automatic Controller; and a Gast Air Compressor Model #3HBB-11T rated at 1.3CFM/70 PSIG.

2.3.2.5 EFFLUENT DISCHARGE SYSTEM

The effluent discharge system shall consist of a 550 Gallon Effluent Tank, Terracon Model #CXF-0550; Effluent Pump capable of 60 GPM at 75 feet of head, Goulds Model #NPE-2ST; and a R-P Products 10 Micron Bag Filter Model #CST-154.

2.3.2.6 EFFLUENT DISCHARGE PIPING

The effluent discharge piping shall be installed below grade to convey treated water from the treatment trailer to the stream outfall. The HDPE piping shall be connected using a solvent welded barb fitting with a worm screw clamp. The effluent discharge piping shall be installed to approximately 4 feet below final grade and consist of 2-inch diameter HDPE. An outfall consisting of geofabric and 6-inches of D50 (3-inch diameter) stone (riprap) shall be constructed at the end of the discharge pipe to the stream. It shall be installed from the top of the slope to the toe to minimize disturbance to the banks of the stream. Soil and sediment controls such as silt fencing and/or temporary stream diversion to minimize potential impacts to the stream shall be installed as needed. The piping shall be bedded in sand or approved backfill compacted in one foot lifts with the surface restoration to match existing conditions. The effluent outfall location and details are shown on Figures 9 and 10.

2.4 CITY WATER AND SEWER

City water supply and sanitary sewer tie ins will be completed at appropriate locations along Washington Street as determined by the City of Jamestown. The city water supply line will be constructed of 3/4-inch Type K copper pipe and installed to a minimum depth of four feet. The sewer pipe will be constructed of 2-inch HDPE from the treatment trailer to a minimum 3-inch diameter PVC sewer line which will run from the office trailer to the main sewer line in Washington Street.

Details and locations of the sewer and city water tie-ins will be provided by the plumbing subcontractor for approval by Rust prior to installation.

2.5 SITE SURFACE COMPLETION

2.5.1 LOW PERMEABILITY COVER

After subsurface installation is completed and the area has been graded, a 6-inch thick clay layer will be placed over the top of ground surface in the area to be remediated. Clay cap will be placed and compacted using a bulldozer. The clay will provide a low permeability cover which will minimize both short circuiting of air from the surface to the SVE wells and infiltration of rain and surface water into the vadose zone soils. In most areas approximately 2-inches of topsoil will be placed over the clay and seeded with a hardy blend to reduce erosion. In the driveway and parking area between the office and treatment trailers the clay layer will be approximately 3-inches thick and covered with crushed stone instead of topsoil. Details of the Site cover are shown on Figure 10.

2.5.2 TREATMENT TRAILER PAD

The pad for placement of the treatment trailer will be constructed as shown on Figure 8. A 12-inch clay layer with a 30-mil HDPE liner at mid depth will be placed to match the grade of the clay cover. A woven geotextile material (Amoco #2016) will be installed above the clay, followed by one foot of compacted NYSDOT Type 4 gravel.

3.0 SEDIMENT REMOVAL

The three floor drain catchbasins, associated drain piping and septic tank outside the existing building shall have the contaminated sediments removed from them. The floor drain sediments shall be manually removed. A 10,000 PSI sewer jet in conjunction with a vacuum truck shall be used to remove the sludge and sediments from the piping and the vacuum truck will remove the sludge and sediment from the septic tank. The septic tank will be inspected to determine its integrity and left inplace unless otherwise directed by NYSDEC. The sediments and sludge material shall be drummed and disposed of at an approved incineration facility.

Water generated during sediment removal activities will be stored on-Site and treated by the groundwater treatment system when it is operational. The following steps will be taken to prevent, contain, and recover spills during the work:

1. Sediment will be manually removed to the extent practicable to minimize use of the sewer jet.

2. Perform visual inspection of floor drains, piping, and septic tank for cracks, holes, etc. to ensure structural integrity and identify potential leaks prior to cleaning.

3. Spread or hang polyethylene sheeting as necessary to control overspray or runoff of water during cleaning.

4. Use adsorbent pads or "socks" to contain and soak up spills as necessary.

5. Keep vacuum truck on "stand by" to respond to and collect any large spills as they occur and to remove sludge from septic tank as soon as possible after drains and pipes have been cleaned.

6. Recovered sediment will be placed in covered drums and stored in Building 2223 until disposal (Figure 1).

4.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

QA/QC will be performed by the Contractor(s) and the Rust Site representative. The quality of the work performed during construction will be verified by the implementation of the construction QA/QC program. The QA/QC activities to be performed are described in detail in the Construction Quality Assurance Project Plan (QAPP).

The CQAPP established inspection and test frequencies will be performed during all components of construction. The inspection and testing requirements will ensure compliance with the design documents as well as completion of the work tasks to the appropriate level of quality.

The inspection documentation requirements as detailed in the CQAPP will provide the framework for proper, thorough, and accurate documentation of all CQA activities.

5.0 DESIGN AND ENGINEERING DOCUMENTS

The following design and engineering documents will be prepared:

i) plan of operation;
ii) approval drawings of trailer enclosed treatment system from vendor;
iii) operation/maintenance manuals for system equipment; and
iv) operation, monitoring and maintenance plan for overall Site management.

The Health and Safety Plan (HASP) and QAPP will be implemented during construction and throughout operation of the treatment system.

6.0 REQUIRED PERMITS

Prior to any excavation activity on-Site, an underground locate survey will be conducted. The City of Jamestown will be notified prior to the construction, installation, and operation of the treatment wells and underground piping. In addition, any off-Site transportation of waste will be conducted using the appropriate methods by a licensed contractor.

6.1 BUILDING PERMIT

A City of Jamestown building permit is not required to construct the treatment building. However, the construction plans will be reviewed with the City to comply with substantive requirements.

6.2 AIR EMISSIONS PERMIT

Air emissions from the SVE system will not require a NYSDEC air permit, but will be monitored and regulated under the terms and conditions of the NYSDEC approved Remedial Design Report prepared by Rust. Combined air stripper/SVE emission limits are presented in Table 2.

6.3 WELL PERMIT

Well permits are not required by the City of Jamestown or NYSDEC for the installation of the SVE and dual phase groundwater/SVE wells, however soil boring and well installation logs will be prepared for each well.

6.4 SEWER USE PERMIT

A sewer use permit application has been submitted by Rust to the City of Jamestown Board of Public Utilities. This permit will be used for the wastewater sewer tie-in from the sand filter system backwash effluent to the Jamestown POTW. A Baseline Monitoring Report (BMR) will be submitted upon startup of treatment system.

6.5 PLUMBING PERMIT

A plumbing permit will be required for the sanitary sewer tie-in at Washington Street. This permit will be procured by the City of Jamestown licensed plumbing subcontractor that performs this tie-in.

6.6 ELECTRICAL PERMIT

An electrical permit will be required for installing electrical service to the Site. This permit will be procured by the City of Jamestown licensed electrician subcontracted to install electrical service to the Site.

6.7 STATE POLLUTION DISCHARGE ELIMINATION SYSTEM (SPDES) PERMIT

Discharge of the treatment system effluent to the stream west of the Site will be performed in compliance with the existing SPDES permit for the Site.

7.0 DECONTAMINATION AND DISPOSAL PROCEDURES

All equipment used during the construction that comes in contact with contaminated soils will be decontaminated. General health and safety guidelines as presented in the HASP will be followed during construction activities. Decontamination procedures are summarized below.

7.1 EQUIPMENT DECONTAMINATION PROCEDURES

All potentially contaminated equipment must be decontaminated prior to demobilization from the Site. All equipment will be decontaminated at the on-Site decontamination pad. Decontamination procedures may include:

i) wiping and/or brushing visible soils from equipment;
ii) pressure washing of large pieces of equipment;
iii) water rinsing using a solution of water and Alconox soap; and
iv) a final water rinse.

Personnel shall wear the following level of protection during decontamination activities:

i) polycoated tyvek coveralls;
ii) steel toe work boots and disposable boot covers or rubber boots;
iii) disposable nitrile inner gloves - chemical resistant;
iv) outer nitrile work gloves - chemical resistant;
v) safety glasses;
vi) splash shields as necessary; and
vii) hard hat.

All personnel shall have accessible a half or full-face air purifying respirator (APR), equipped with combination cartridges for organic vapors and particulates.

Any wastewaters generated during decontamination activities will be collected and stored in a temporary polyethylene storage tank until treated on-Site. All disposable and/or soiled PPE will be placed in covered containers and stored until appropriate disposal arrangements are made.

7.2 PERSONNEL DECONTAMINATION PROCEDURES

The personnel decontamination procedures as outlined in the HASP will be adhered to during decontamination activities.

8.0 SITE RESTORATION PLAN

Once the remedial activities have been completed, the treatment building and office trailers will be disconnected, removed and transported to CRA Services' Niagara Falls, New York location. Above grade piping and equipment will be removed. Any Site structures or surface features that were altered or damaged during the course of treatment will be repaired.

Subsurface piping will be abandoned in place. Wells will be either grouted inplace or decommissioned as approved by NYSDEC.

9.0 ENVIRONMENTAL PROTECTION

9.1 AIR POLLUTION CONTROL

During construction activities all necessary measures will be taken to control air emissions in accordance with applicable standards. Air quality and work zone monitoring will be conducted according to the site-specific Health and Safety Plan.

Treatment system emissions will be monitored and managed per Table 2 in the Remedial Design Report by Rust.

9.2 NOISE CONTROL

During construction, noise levels from equipment, vehicles and associated activities will be controlled to ensure that noise levels do not exceed the required ambient sound levels at the Site perimeter:

Time of Day	*LEQ*
7:00 a.m. to 10:00 p.m.	57 dBA
10:00 p.m. to 7:00 a.m.	47 dBA

Noise levels shall be measured in decibels on a sound level meter, conforming to the requirements of the American National Standard Specification for sound level meters, S1.4 (1971), Type 52A, and set to use a weighted network with slow meter response. Measurements shall be made at the Site perimeter in line with the source of noise and the nearest residences.

9.3 DUST CONTROL

During construction all necessary measures shall be used to minimize the migration of dust on-Site and off-Site due to Site activities. Reasonable fugitive dust suppression methods shall be employed during all Site activities that my generate airborne dust.

Dust control on all unpaved areas used by transport vehicles and construction vehicles during dry weather conditions shall consist of wetting the surface with water on a daily basis as conditions warrant. If conditions exist or if directed by Engineer, more water shall be added for dust control.

9.4 ODOR CONTROL

Necessary measures will be taken to control odor to an acceptable level as determined by Engineer.

9.5 SOIL EROSION AND SEDIMENT CONTROL

During construction, soil erosion and sediment controls shall be enacted in accordance with the requirements in the New York Guidelines for urban erosion and sediment control. Soil erosion and sediment control measures may include silt fencing, hay bales and temporary seeding or mulching.

The disturbance of erodible materials exposed by clearing and grubbing shall be minimized and the appropriate sediment control measures will be used.

Surface runoff into contaminated areas will be prevented by using berms, dikes, or other measures approved by the Engineer. During trenching activities, excavated materials will be placed upgradient to minimize the amount of surface runoff entering the trench.

All necessary control measures shall be installed prior to the start of any land disturbances.

All sediment and erosion control devices will be inspected daily and will be left inplace until construction is completed.

9.6 SURFACE WATER MANAGEMENT

Surface water will be managed to prevent clean water from entering the Site as well as potentially contaminated water from leaving the Site.

On-Site surface water should be minimal due to curb and storm drains adjacent to the Site on Washington Street.

Earthworks will be scheduled to minimize work being performed during inclement weather.

Within the exclusion zone, construction activities shall be phased such that precipitation does not run off-Site.

Areas of bare soil exposed at any time by construction will be kept to a minimum.

Potentially contaminated surface water generated as a result of Site work will be prevented from runoff to off-Site areas by appropriately installed berms, dikes, collection trenches, etc.

9.7 WASTEWATER MANAGEMENT

All wastewaters collected and generated during construction activities will be stored in portable polyethylene storage tanks in the treatment area at a location to be determined. After startup of the treatment system all storage waters will be discharged to and treated by the treatment system.

A decontamination pad will be provided for decontamination of vehicles and equipment. The pad shall be 10 feet by 20 feet with an impermeable base and a sump and collection system to contain all decontamination water. The decontamination water will be pumped to the on-Site storage tanks. Temporary storage tanks may be placed inside Building #2223 such that construction operations can proceed without delay.

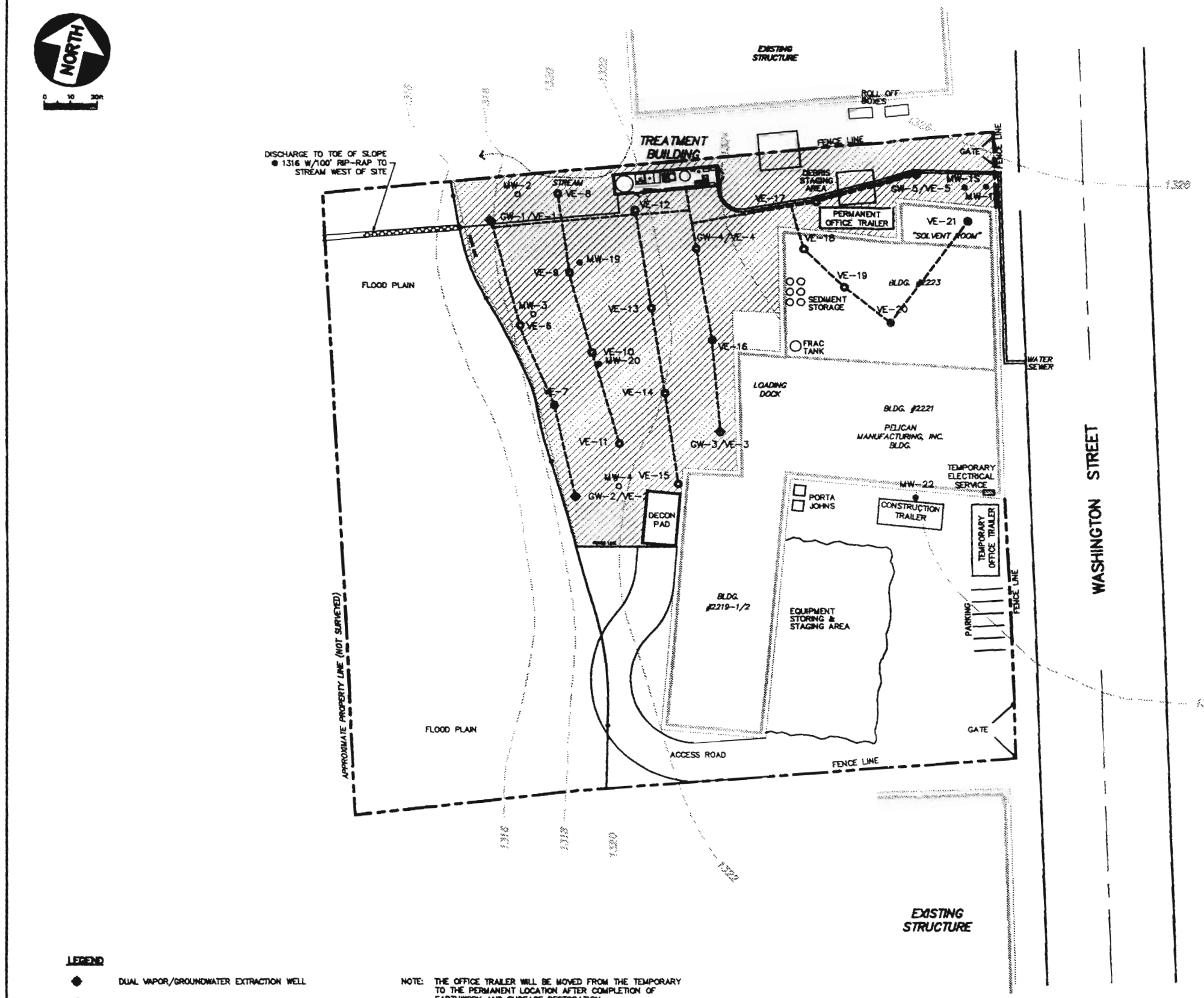
10.0 WORK SCHEDULE

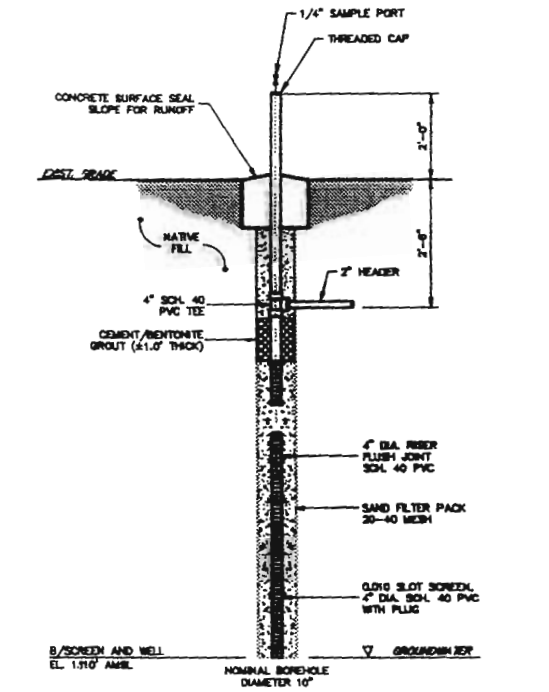
Figure 12 presents the preliminary construction schedule for the work to be performed at the Pelican Manufacturing Site.

Work will be conducted only between the hours of 7:00 a.m. to 6:00 p.m., Monday through Saturday.

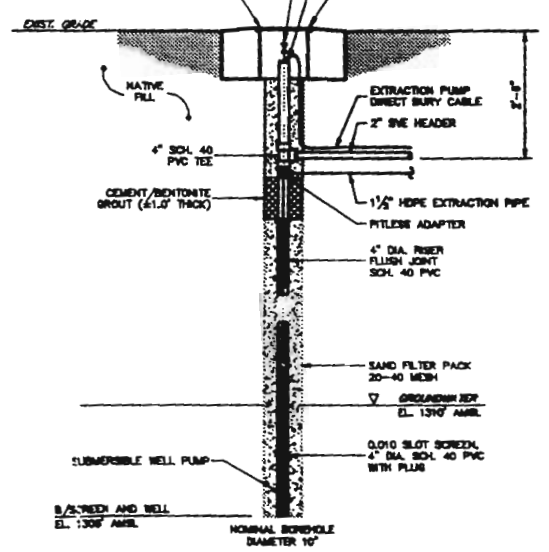
FIGURES

FIGURES





TYPICAL SOIL VAPOR EXTRACTION WELL INSTALLATION DETAIL



TYPICAL DUAL PHASE EXTRACTION WELL INSTALLATION DETAIL

LEGEND

- DUAL VAPOR/GROUNDWATER EXTRACTION WELL
- SOIL VAPOR EXTRACTION WELL
- APPROXIMATE AREAL EXTENT OF SURFACE AND SUBSURFACE SOIL TO BE REMEDIATED
- DISCHARGE PIPING
- COLLECTION PIPING
- RIP-RAP

NOTE: THE OFFICE TRAILER WILL BE MOVED FROM THE TEMPORARY TO THE PERMANENT LOCATION AFTER COMPLETION OF EARTHWORK AND SURFACE RESTORATION.

NO.	REVISIONS	DRAWN	CHKD.	APP.	DATE

SCALE : 1" = 20'-0"

PROJECT NUMBER: 07476-00 FILE NAME: 07476-00(004)GN-NF001

TreaTek - CRA™ COMPANY

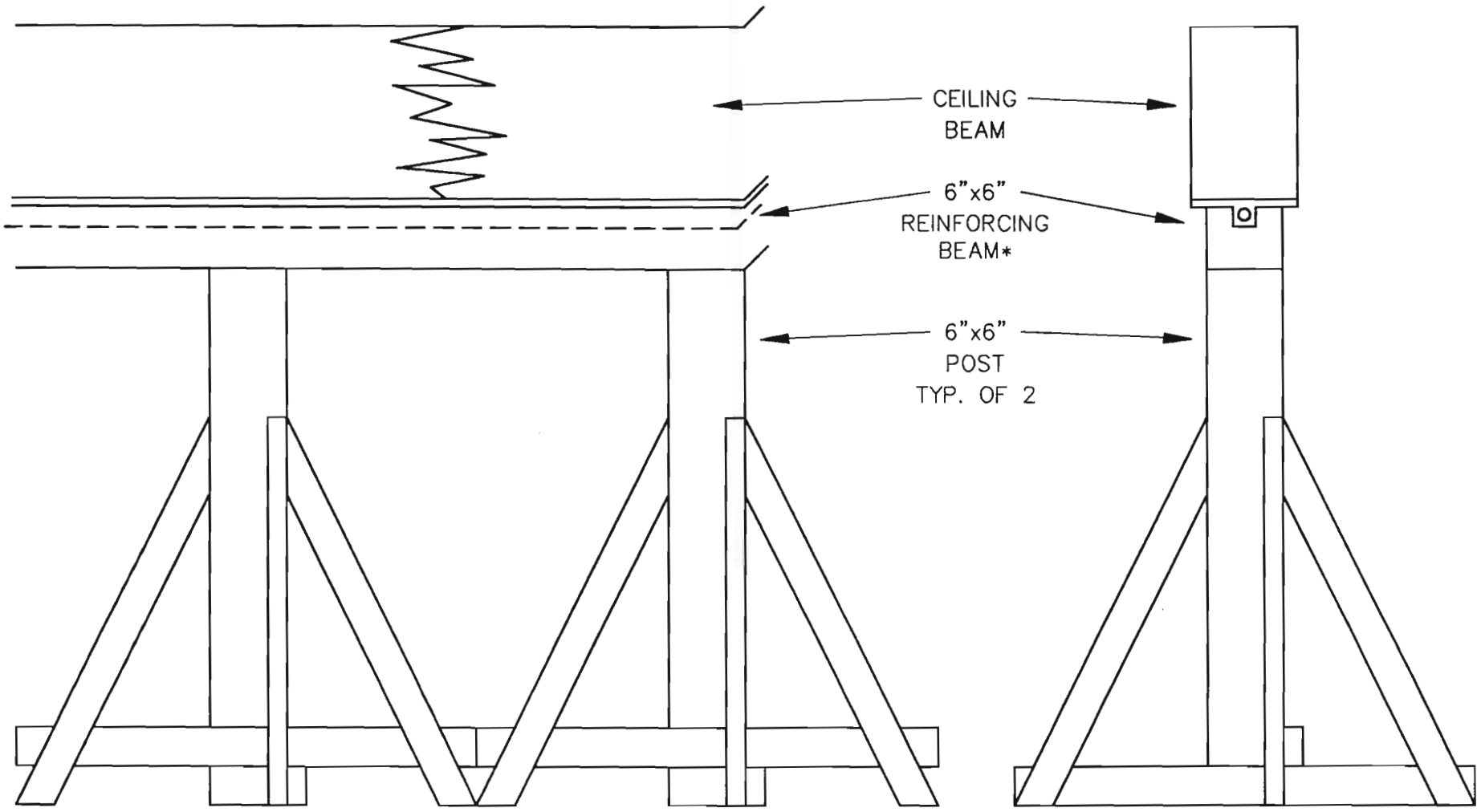
DRAWN BY	B.A. BEEBE
DATE	5-15-98
DESIGNED BY	B.A. BEEBE
DATE	
APPROVED	
DATE	

PELICAN MANUFACTURING, INC. SITE
CITY OF JAMESTOWN, NEW YORK

DWG. FIGURE 1 SHT.

GROUNDWATER AND SVE TREATMENT SYSTEM - SITE PLAN AND

May 15, 1998

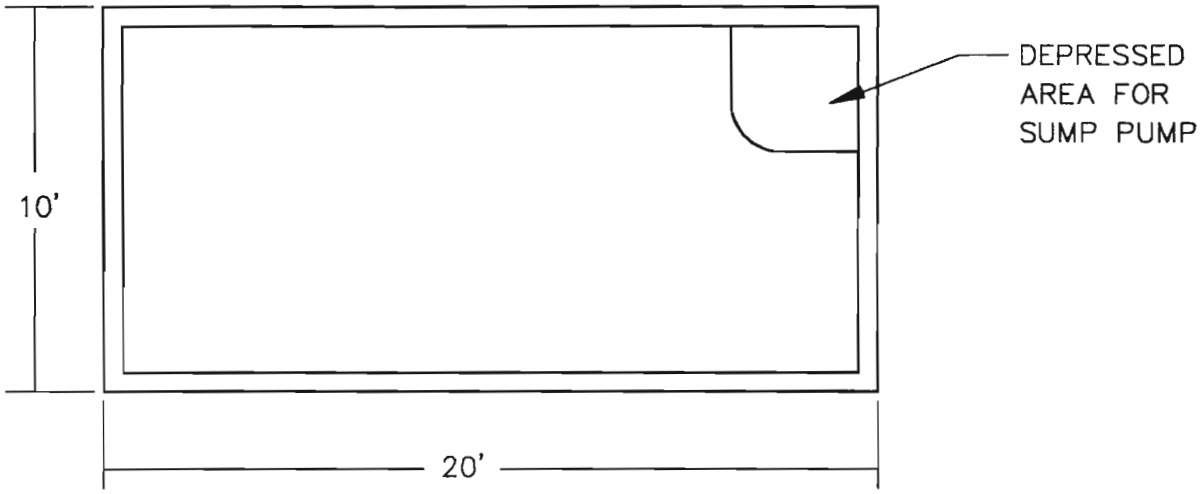


*NOTE: 6"x6" REINFORCING BEAM W/1"x1" NOTCH DOWN CENTER TO ACCOMODATE EXISTING BEAM TENSION ROD

figure 2
ROOF BRACE DETAILS
PELICAN MANUFACTURING, INC. SITE
Jamestown, New York

CRA

06/19/98



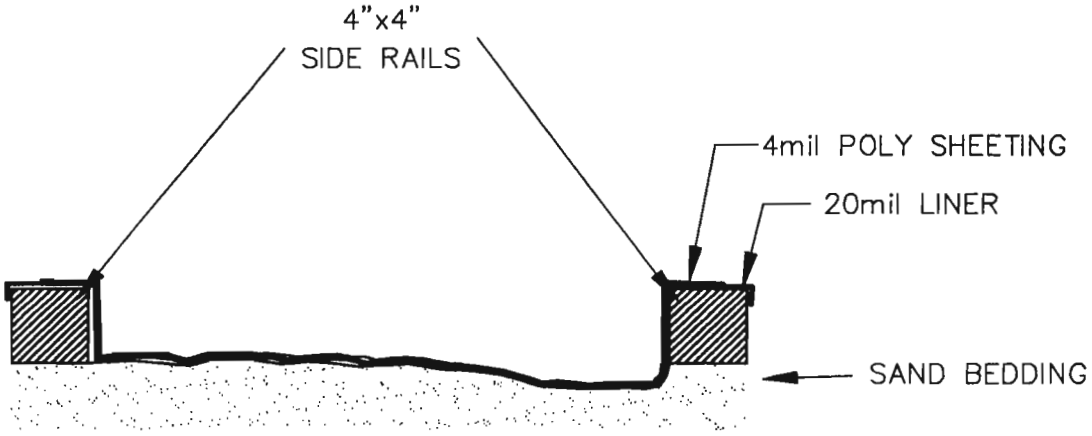
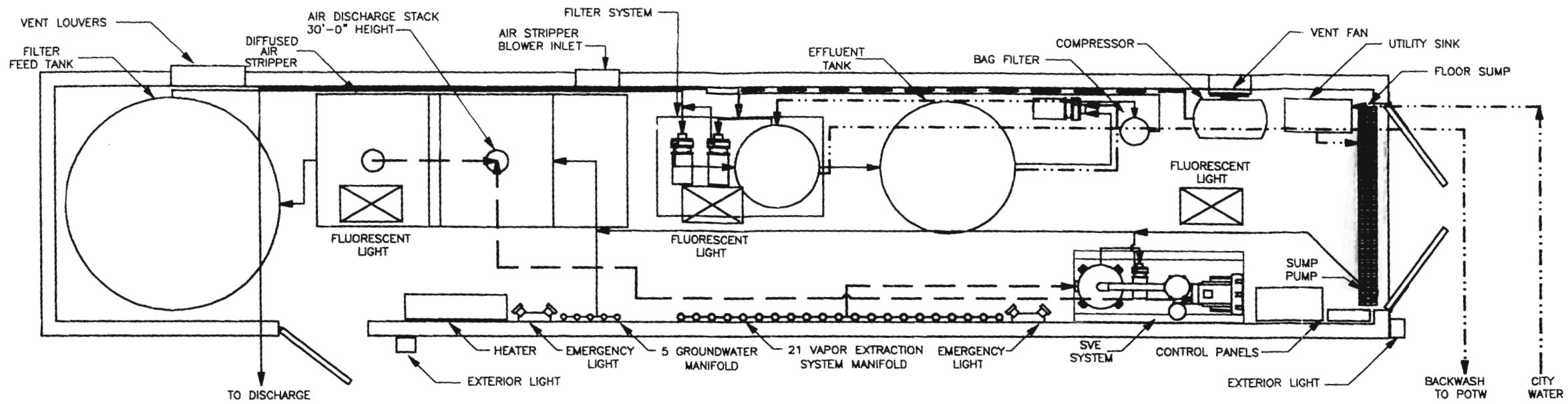
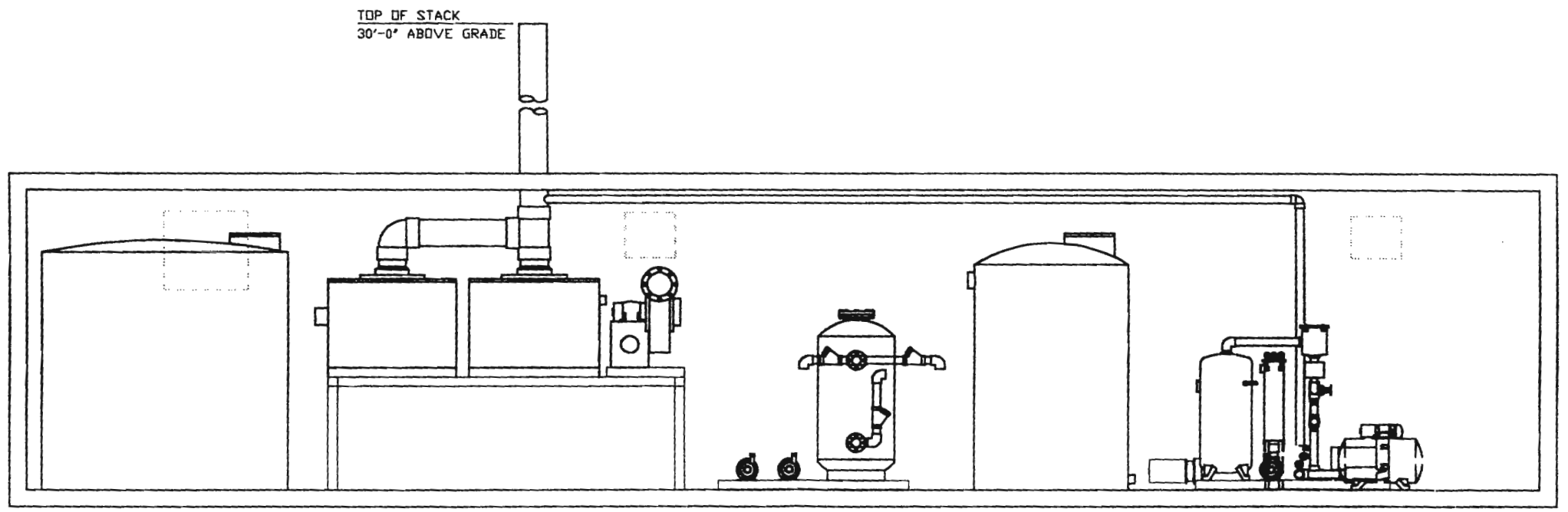


figure 3
DECON PAD DETAILS
PELICAN MANUFACTURING, INC. SITE
Jamestown, New York

CRA

06/12/98





NOTE:

1. ALL INSTALLATION/CONSTRUCTION WILL BE IN COMPLIANCE WITH NEC AND LOCAL BUILDING CODES.
2. MINIMUM 1" HIGH SILL @ DOORWAYS.

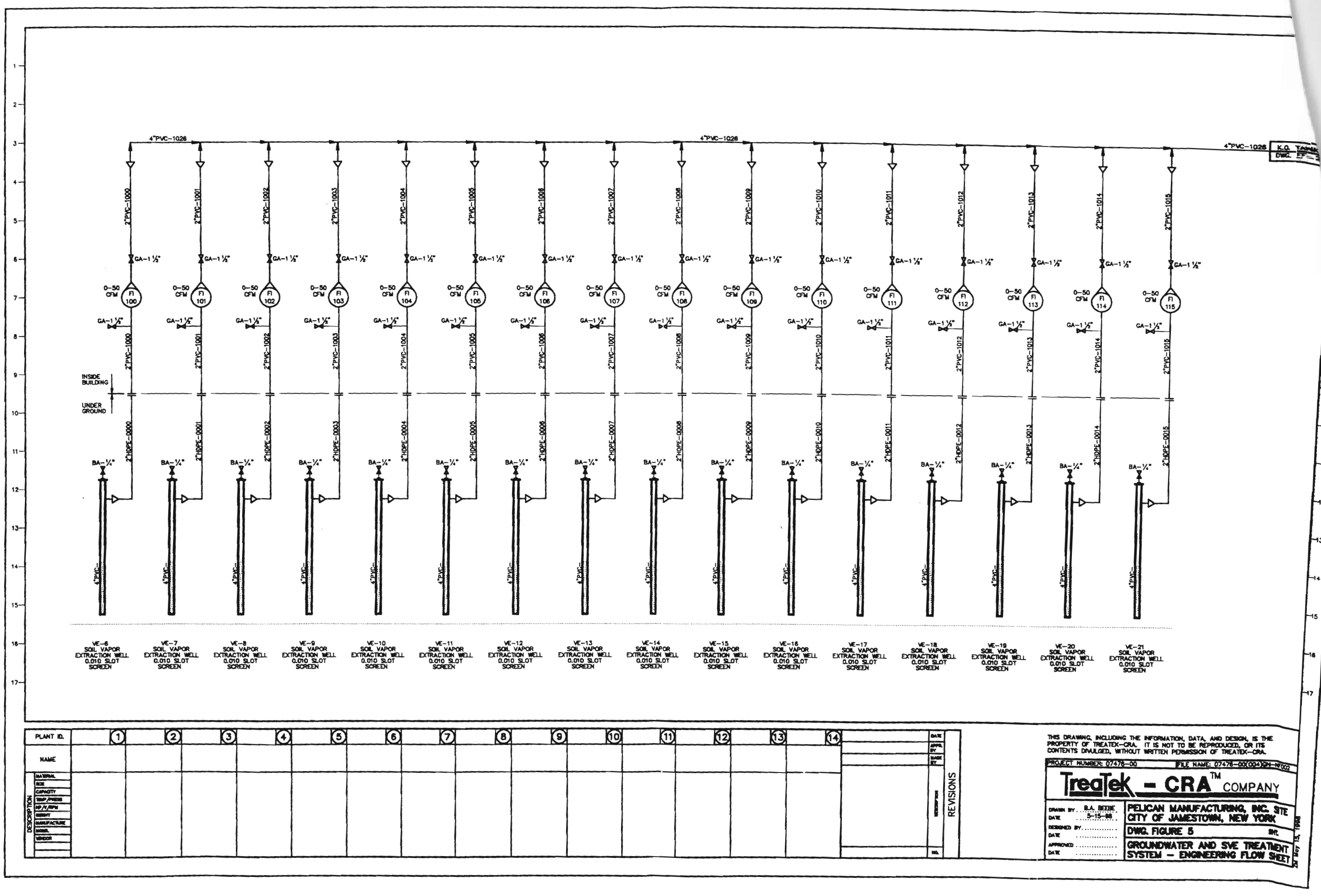
figure 4

REV. NO.	DATE	DESCRIPTION	DRWN BY	CHKD BY	APP'D BY

BISCO Environmental
Soil & Groundwater Remediation Equipment
60 Stergis Way
Dedham, Massachusetts 02026
(617) 461-1560 Fax (617) 461-1152

TITLE: VAPOR & GROUNDWATER EXTRACTION SYSTEM LAYOUT
TREATEK–CRA
PELICAN MANUFACTURING, INC.
JAMESTOWN, NY

DRAWN BY RL	DESIGNED BY DM	SCALE 1"=20"	
CHECKED BY	APPROVED BY	DATE 8/21/97	
PROJECT NO. 10067	REV. NO.	DRAWING NO. 10067DML	



PLANT ID.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
NAME														
DESCRIPTION: MATERIAL														
SIZE														
CAPACITY														
TEMP./PRESS.														
HP/V/RPH														
WEIGHT														
MANUFACTURE														
MODEL														
VENDOR														

REVISIONS

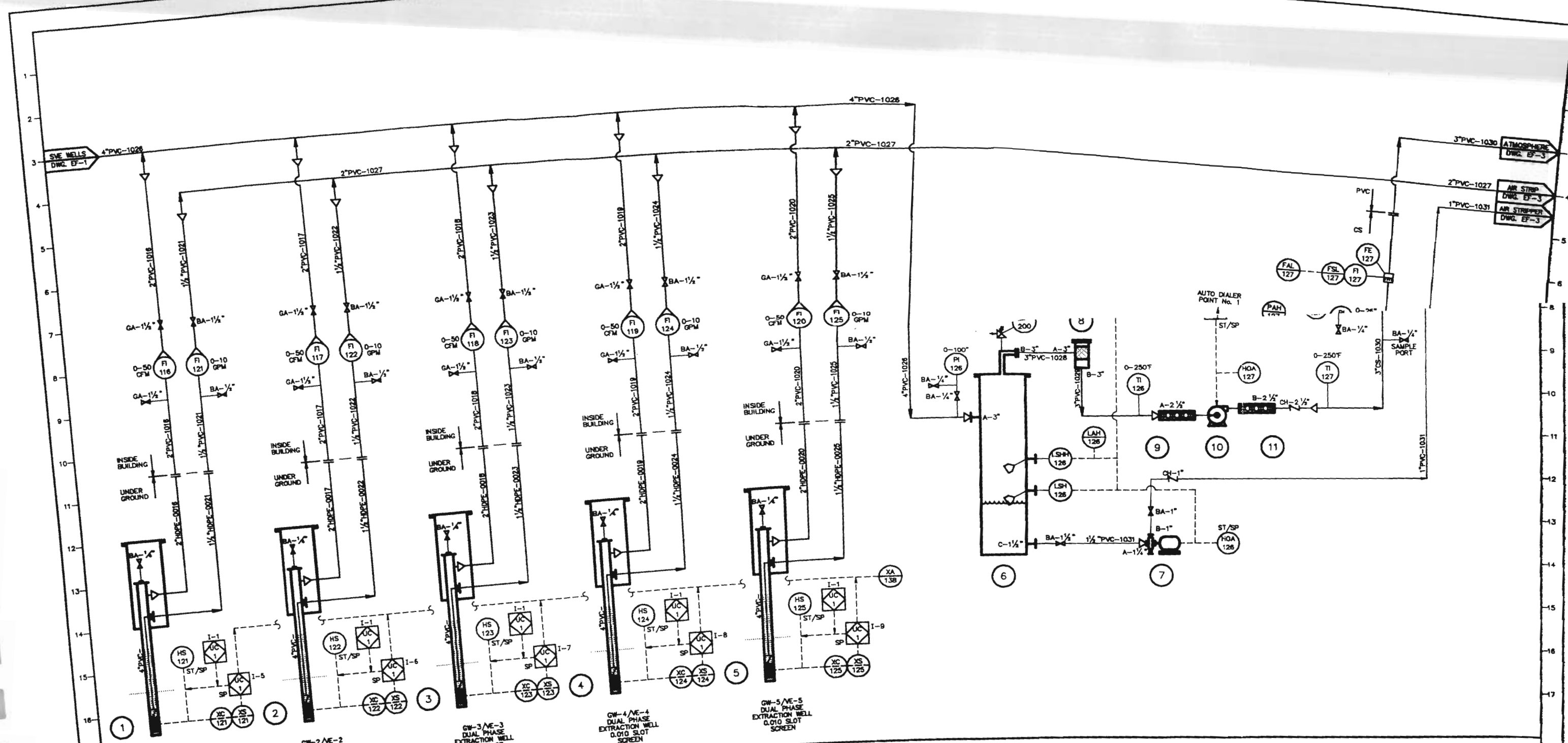
DATE	APPR. BY	MADE BY	DESCRIPTION	NO.

PROJECT NUMBER: 07478-00 | FILE NAME: 07478-00(004)GN-NF002

TreaTek - CRA™ COMPANY

DRAWN BY: B.A. BEEBE	PELICAN MANUFACTURING, INC. SITE
DATE: 5-15-00	CITY OF JAMESTOWN, NEW YORK
DESIGNED BY:	DWG. FIGURE 5
DATE:	SHT.
APPROVED:	GROUNDWATER AND SVE TREATMENT SYSTEM - ENGINEERING FLOW SHEET
DATE:	

Sat May 15, 1999



PLANT ID.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
NAME	GW-1/VE-1 EXTRACTION PUMP	GW-2/VE-2 EXTRACTION PUMP	GW-3/VE-3 EXTRACTION PUMP	GW-4/VE-4 EXTRACTION PUMP	GW-5/VE-5 EXTRACTION PUMP	KNOCKOUT TANK No. 1	KNOCK-OUT TRANSFER PUMP	IN-LINE FILTER No. 1	INLET SILENCER No. 1	REGENERATIVE BLOWER	DISCHARGE SILENCER No. 2			
DESCRIPTION: MATERIAL	S.S.	S.S.	S.S.	S.S.	S.S.	C.S.	S.S.			S.S.				
SIZE	1" NPT	1" NPT	1" NPT	1" NPT	1" NPT	24"DIA.x44"H	1x1.25-6	14"DIA.x27.13"H		21.5"Lx18"Wx20"H				
CAPACITY	7 GPM	7 GPM	7 GPM	7 GPM	7 GPM	80 GALLONS	10 GPM @ 25' HD	10 MICRON		420 CFM				
HP/F/RPM	.33/120/3450	.33/120/3450	.33/120/3450	.33/120/3450	.33/120/3450		.5/460/1760			10/460/3450				
WEIGHT	27 LBS	27 LBS	27 LBS	27 LBS	27 LBS	LBS	297 LBS	LBS		297 LBS				
MANUFACTURE	GRUNDFOS	GRUNDFOS	GRUNDFOS	GRUNDFOS	GRUNDFOS	BISCO	GOULD GJM	SOLBERG		CAST				
MODEL	7S03-8	7S03-8	7S03-8	7S03-8	7S03-8		NPE-1ST	CSL-235P-300	INTEGRAL TO BLOWER	R7100R-50	INTEGRAL TO BLOWER			
VENDOR														

REVISIONS

NO.	DESCRIPTION	BY	DATE

PROJECT NUMBER: 07476-00 FILE NAME: 07476-00(004)GN-NF003

TreaTek - CRA™ COMPANY

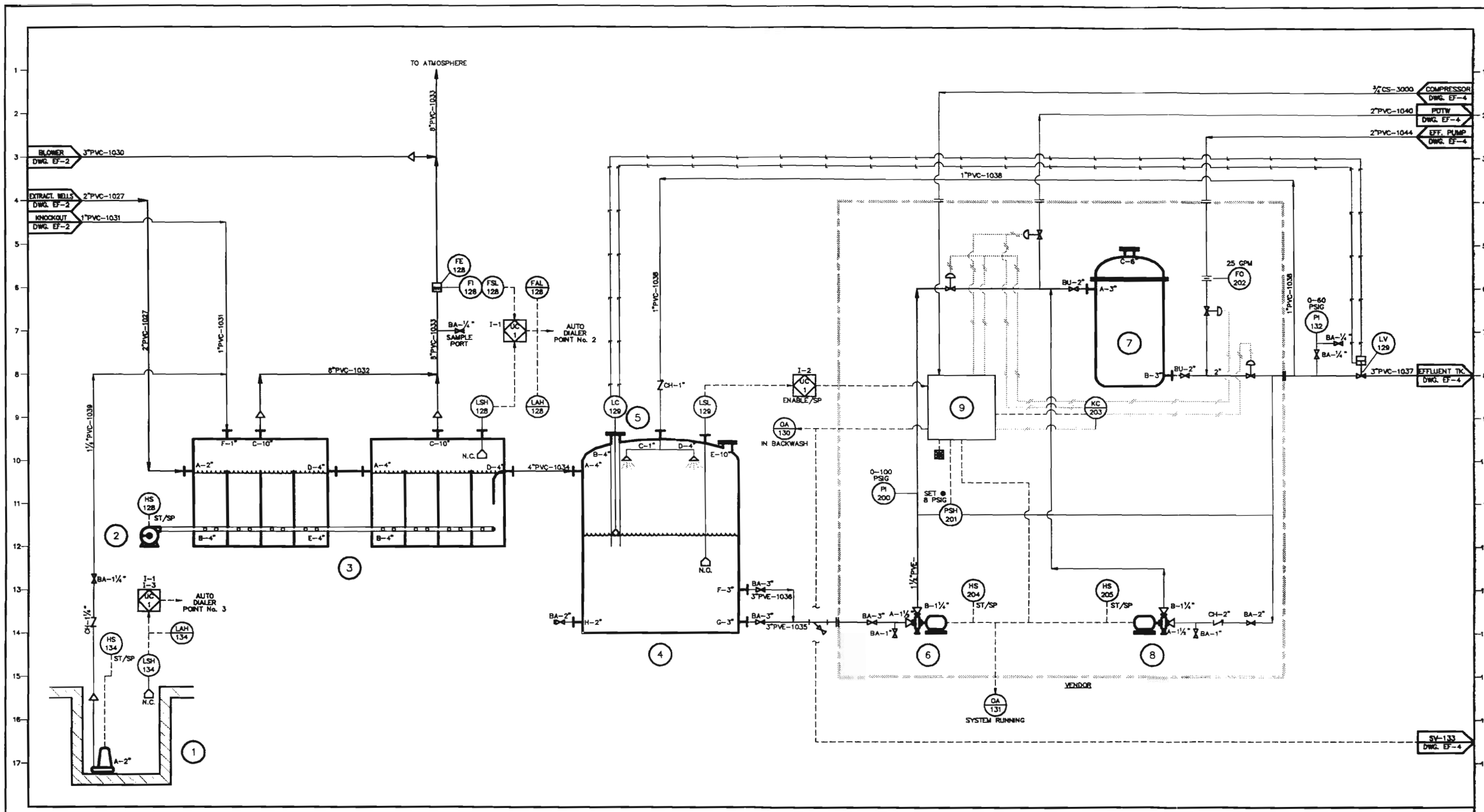
DRAWN BY: B.A. BEEBE
DATE: 5-15-98
DESIGNED BY:
DATE:
APPROVED:
DATE:

PELICAN MANUFACTURING, INC. SITE
CITY OF JAMESTOWN, NEW YORK

DWG. FIGURE 6 SHT.

GROUNDWATER AND SVE TREATMENT SYSTEM - ENGINEERING FLOW SHEET

May 15, 1998



PLANT ID.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
NAME	BUILDING SUMP PUMP	AIR STRIPPER BLOWER	AIR STRIPPER TANK	SAND FILTER FEED TANK	SPRAY NOZZLE	SAND FILTER FEED PUMP	SAND FILTER VESSEL	FILTER RECYCLE PUMP	AUTOMATIC CONTROLLER					
DESCRIPTION: MATERIAL	C.I.		PVC	XPLE	PVC	S.S.	304 S.S.	S.S.						
SIZE	2" NPT		8'-2"Lw'-0"Wx3'-0"H	77"Dx78"SS	.25"	1.25x1.5-6	30"DIA.x54"H	1.25x1.5-6						
CAPACITY	10 GPM @ 40'HD	800 CFM	50 GPM	1600 GALLONS		60 GPM @ 50'HD	100 PSIG/140° F	60 GPM @ 50'HD						
TEMP./PRESS		7.5/460/				1.5/460/3500		1.5/460/3500						
HP/V/RPM	.5/460/3500	1685 LBS												
WEIGHT														
MANUFACTURE	GOULDS CAM.			TERRACON		GOULDS	DIAMOND	GOULDS	DIAMOND					
MODEL	ME0511H	MSDB-100		CXF-1600	TFBFC	NPE-GROUP 2ST	V124-5.0	NPE-GROUP 2ST	SERIES 4000					
VENDOR	ESTABROOK	CARBTROL CORPORATION				DIAMOND WATER SYSTEMS INC.								

REVISIONS

NO.	DESCRIPTION	NAME BY	APPR. BY	DATE

PROJECT NUMBER: 07478-00 | FILE NAME: 07478-00(004)GN-NF004

TreaTek - CRA™ COMPANY

DRAWN BY: B.A. HEEBE
DATE: 5-15-98
DESIGNED BY:
DATE:
APPROVED:
DATE:

PELICAN MANUFACTURING, INC. SITE
CITY OF JAMESTOWN, NEW YORK

DWG.FIGURE 7 SHT.

GROUNDWATER AND SVE TREATMENT SYSTEM - ENGINEERING FLOW SHEET

24 May 15, 1998

AUTO. CONTROL DWG. EF-3 — ¾"CS-3000 — ½"CS-3001

BACKWASH DWG. EF-3 — 2"PVC-1040

FILTER PUMP DWG. EF-3 — 2"PVC-1044

SAND FILTER SHEET 3 — 3"PVC-1037

2"PVC-1040

2"PVC-1044

3"PVC-1037

½"CS-3001

2"PVC-1042

2"PVC-1041

1"CS-3000

AV

I-1 I-2 GC 1

I-4 GC 1

SET 15 PSI

BA-½"

BA-1"

BA-2"

BA-¾"

SET 75 PSIG

PSV 300

PSC 300

PSL 300

PAL 300

LC 134

LAH 133

LSH 133

LSL 133

SV 133

FV 133

LV 134

PAH 135

PSH 135

PI 135

FQI 137

FQI 136

HS 133 ST/SP

0-60 PSIG

PI 133

2"HDPE-0026 — PUBLIC OWNED TREATMENT WORKS

2"HDPE-0027 — TO STREAM OUTFALL

A-3" B-4" C-18" D-6" N.C. N.O. F-2" E-2" A-1½" B-1¼" C-¾" A-2" B-2" C-¾"

1 2 3 4

SAND FILTER DWG. EF-3

PLANT ID.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
NAME	AIR COMPRESSOR	EFFLUENT TANK	EFFLUENT PUMP	BAG FILTER										
DESCRIPTION: MATERIAL	C.S.	XLPE	S.S.	C.S.										
SIZE		48"Dx72"SS	1.5x2-6 (5.625)	8.250x33.38"H										
CAPACITY	12 GALLON	550 GALLONS	60 GPM @ 75'HD	10 MICRON										
TEMP./PRESS	1.3 CFM/70 PSI			250° F/150 PSI										
HP/V/RPH	.33/115V/		3/460/3500											
WEIGHT														
MANUFACTURE	GAST	TERRACON	GOULDS	R-P PRODUCTS										
MODEL	3HBB-11T	CXF-0550	NPE-2ST ESTABROOK	CST-154										
VENDOR														

DATE | APPD. BY | MADE BY | DESCRIPTION | NO. — REVISIONS

PROJECT NUMBER: 07478-00 — FILE NAME: 07478-00(004)SH-NF005

TreaTek - CRA™ COMPANY

DRAWN BY: B.A. BEEBE — DATE: 5-15-98

DESIGNED BY: — DATE:

APPROVED: — DATE:

PELICAN MANUFACTURING, INC. SITE
CITY OF JAMESTOWN, NEW YORK

DWG. FIGURE 8 — SHT.

GROUNDWATER AND SVE TREATMENT SYSTEM — ENGINEERING FLOW SHEET

ZIP May 15, 1998

NORTH

0 5 10FT

EXISTING STRUCTURE

FENCE LINE

STREAM

TREATMENT BUILDING

OFFICE

PERMANENT OFFICE TRAILER

"SOLVENT ROOM"

PIPING INSIDE THIS BUILDING IS ABOVE GRADE W/ HEAT TRACE

BLDG. #2221

LOADING DOCK

BLDG. #2221
PELICAN MANUFACTURING, INC. BLDG.

BLDG. #2210-1/2

DISCHARGE TO TOE OF SLOPE @ 1316 W/100' RIP-RAP TO STREAM WEST OF SITE

MW-2
VE-8
VE-12
GW-1/VE-1
MW-19
VE-9
MW-3
VE-6
VE-10
MW-20
VE-7
VE-13
VE-14
VE-11
GW-2/VE-2
MW-4
VE-15
GW-4/VE-4
VE-16
GW-3/VE-3
VE-17
VE-18
VE-19
VE-20
VE-21
GW-5/VE-5
MW-1S
MW-1D
MW-22

7476-MP-03 (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13)

DECON PAD

TEMPORARY ELECTRICAL SERVICE

CONSTRUCTION TRAILER

PORTA JOHNS

TEMPORARY OFFICE TRAILER

CITY WATER METER

WASHINGTON STREET

1326

1324

1316

1318

1320

1322

APPROXIMATE PROPERTY LINE (NOT SURVEYED)

LEGEND

MW-19 ●	EXISTING SHALLOW WELLS
MW-15 ●	EXISTING SHALLOW/DEEP WELL PAIR
MW-4 ○	EXISTING DEEP WELLS
GW-2/VE-2 ◆	DUAL VAPOR/GROUNDWATER EXTRACTION WELL
VE-11 ⊙	SOIL VAPOR EXTRACTION WELL
———	DISCHARGE PIPING
— — —	COLLECTION PIPING
▦	RIP-RAP

NOTE:
ALL INSTALLATION/CONSTRUCTION WILL BE IN COMPLIANCE WITH NEC AND LOCAL BUILDING CODES.

NO.	REVISIONS	DRAWN	CHKD.	APP.	DATE

SCALE : 1" = 10'-0"

PROJECT NUMBER: 07476-00 FILE NAME: 07476-00(004)GN-NF006

TreaTek - CRA™ COMPANY

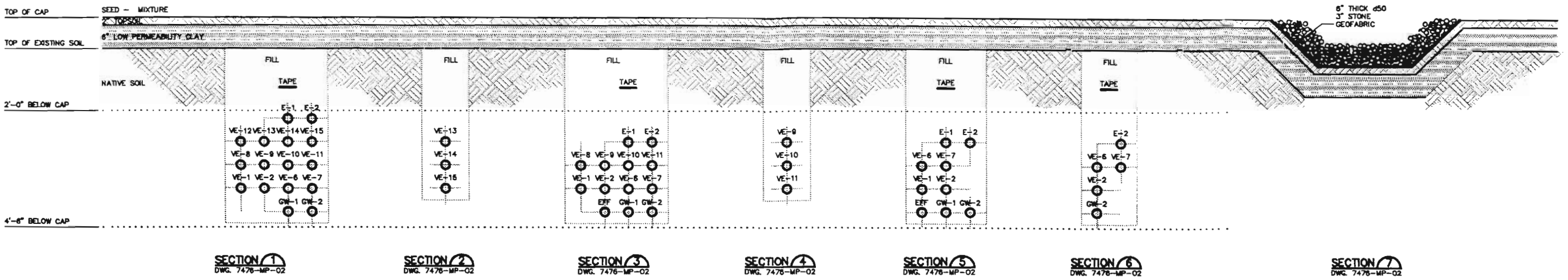
DRAWN BY	B.A. BEEBE
DATE	5-15-98
DESIGNED BY	B.A. BEEBE
DATE	
APPROVED	
DATE	

PELICAN MANUFACTURING, INC. SITE
CITY OF JAMESTOWN, NEW YORK

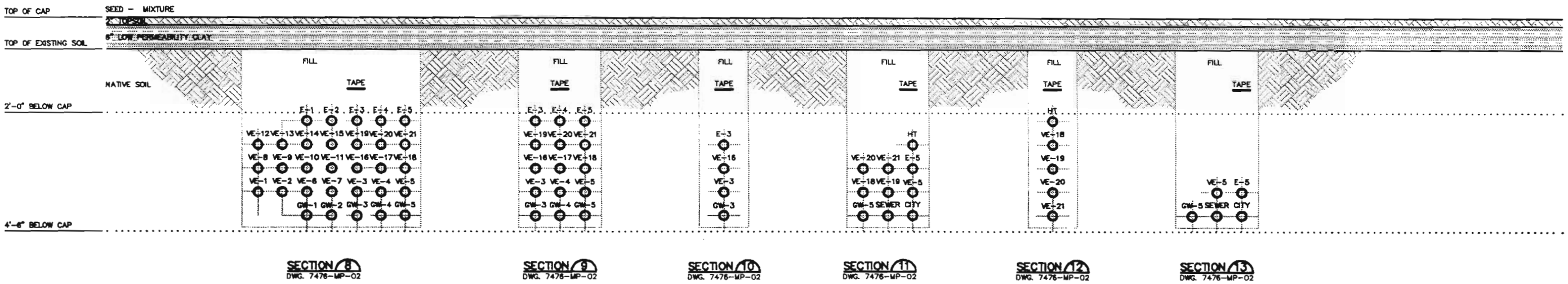
DWG. FIGURE 9 SHT.

GROUNDWATER AND SVE TREATMENT SYSTEM - SYSTEM PLAN

ZM May 15, 1998



TRENCHES WEST OF TREATMENT BUILDING



TRENCHES EAST OF TREATMENT BUILDING

LEGEND

E-1	ELECTRICAL LINE TO PUMPS
GW-1	GROUNDWATER LINE FROM WELL TO BUILDING
VE-1	VAPOR EXTRACTION FROM WELL TO BUILDING
EFF	EFFLUENT
CITY	CITY WATER IN
SEWER	SEWER LINE TO CITY LINE
HT	HEAT TRACE POWER SUPPLY

NOTES:

1. ALL WATER LINES WILL BE INSTALLED AT A MINIMUM OF 4'-0" BELOW FINAL GRADE.
2. ALL VAPOR EXTRACTION PIPING UNDER ROADWAYS OR LESS THEN 3'-0" BELOW FINAL GRADE WILL BE COVERED WITH 1" THICK RIGID FOAM BOARD INSULATION.
3. COMPACTION OF TRENCH BACKFILL WILL BE COMPLETED IN 1'-0" LIFTS BY VIBRATORY COMPACTION, SUPPLEMENTED BY "HAND" COMPACTION AROUND INDIVIDUAL PIPES AS NECESSARY.
4. ALL INSTALLATION CONSTRUCTION WILL BE IN COMPLIANCE WITH NEC AND LOCAL BUILDING CODES.

NO.	REVISIONS	DRAWN	CHKD.	APP.	DATE

SCALE : 1" = 1'-0"

PROJECT NUMBER: 07476-00 FILE NAME: 07476-00(004)GN-NF007

TreaTek – CRA™ COMPANY

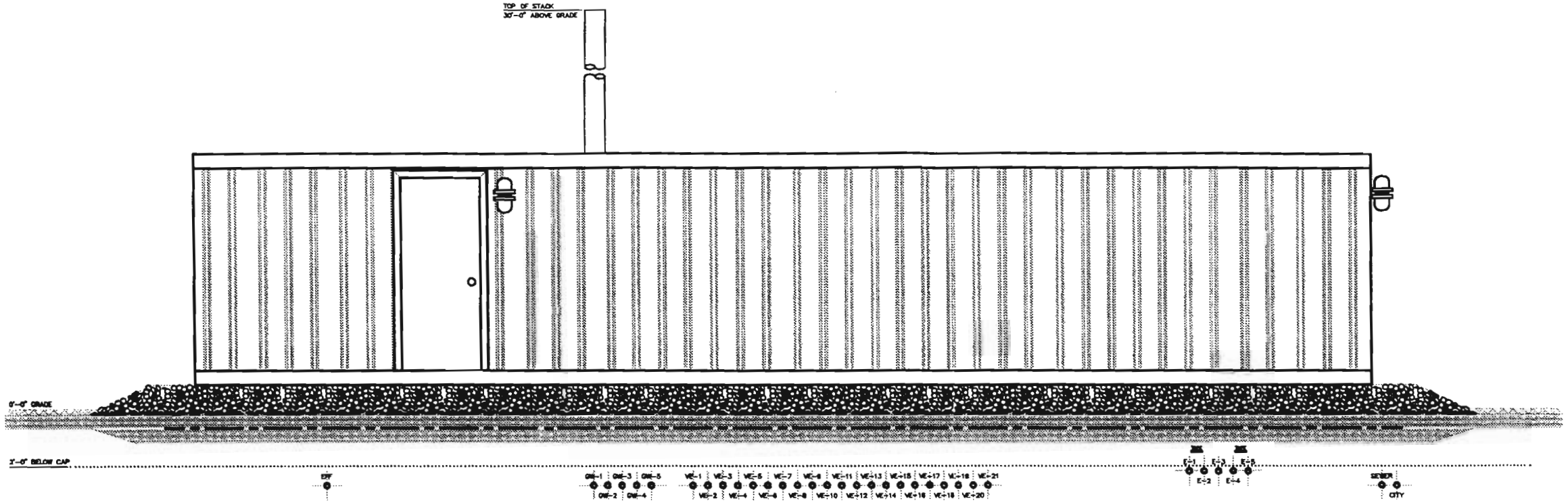
DRAWN BY B.A. BEEBE DATE 5-15-96
DESIGNED BY B.A. BEEBE DATE
APPROVED DATE

PELICAN MENUFACTURING, INC. SITE
CITY OF JAMESTOWN, NEW YORK

DWG. FIGURE 10 SHT.

GROUNDWATER AND SVE TREATMENT BUILDING – TRENCH SECTIONS

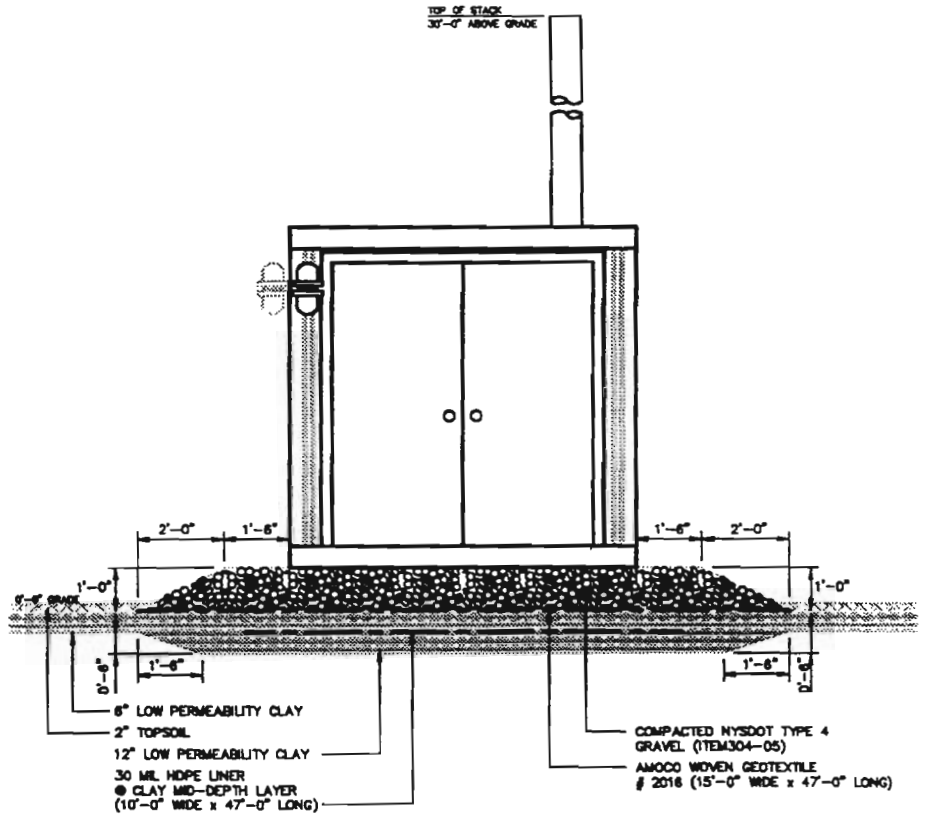
29 May 15, 1996



SOUTH ELEVATION

LEGEND

E-1	ELECTRICAL LINE TO PUMPS
GW-1	GROUNDWATER LINE FROM WELL TO BUILDING
VE-1	VAPOR EXTRACTION FROM WELL TO BUILDING
EFF	EFFLUENT
CITY	CITY WATER IN
SEWER	SEWER LINE TO CITY LINE
HT	HEAT TRACE POWER SUPPLY



EAST ELEVATION

NOTE:
ALL INSTALLATION/CONSTRUCTION WILL BE IN COMPLIANCE WITH NEC AND LOCAL BUILDING CODES.

NO.	REVISIONS	DRAWN	CHKD.	APP.	DATE

SCALE : 1/2" = 1'-0"

PROJECT NUMBER: 07476-00 FILE NAME: 07476-00(004)GN-NF008

TreaTek - CRA™ COMPANY

DRAWN BY B.A. BEEBE
DATE 5-15-96
DESIGNED BY B.A. BEEBE
DATE
APPROVED
DATE

PELICAN MENUFACTURING, INC. SITE
CITY OF JAMESTOWN, NEW YORK

DWG. FIGURE 11 SHT.

GROUNDWATER AND SVE TREATMENT BUILDING - ELEVATIONS

ZK May 15, 1996

FIGURE 12 CONSTRUCTION SCHEDULE PELICAN MANUFACTURING

ID #	TASK	DURATION	5/4	5/11	5/18	5/25	6/1	6/8	6/15	6/22	6/29	7/6	7/13	7/20	7/27	8/3	8/10	8/17	8/24	8/31	9/7	9/14	9/21	9/28	10/5	10/12	10/19	10/26	11/2	11/9
1	CONTRACT EXECUTED	1dy	X 5/1																											
2	MATERIAL/ EQUIPMENT SUBMITTALS	2wk																												
3	H&S,WORK,QUAPP PLAN SUBMITTALS	3wk																												
4	REVIEW & REVISION of SUBMITTALS	4wk																												
5	APPROVAL of PLANS	1wk																												
6	NOTICE to PROCEED	1dy								X 6/22																				
7	SUBCONTRACTOR PROCUREMENT	1wk																												
8	EQUIPMENT/ MATERIAL ORDERING	1wk																												
9	SHOP DRAWING SUBMITTALS	1dy									X 6/30																			
10	REVIEW & REVISION of SUBMITTALS	2wk																												
11	MOBLIIZATION	1wk																												
12	BUILDING MAINTENANCE	1wk																												
13	SITE PREPARATION	2wk																												
14	TEMPORARY POWER INSTALLATION	1wk																												
15	FENCE INSTALLATION	1wk																												
16	OFFICE TRAILER DELIVERY	1wk																												
17	SEDIMENT REMOVAL	1wk																												
18	WELL INSTALLATION	2wk																												
19	PRELIMINARY OPERATION PLAN	1wk																												
20	BASIC O & M PLAN	1wk																												
21	TRENCHING/ UNDERGROUND PIPING	3wk																												
22	WELL TIE-IN	3wk																												
23	OUTFALL CONSTRUCTION	1wk																												
24	UTILITY TIE-IN	1wk																												
25	MOVE OFFICE TRAILER	1wk																												
26	FINAL OPERATION PLAN	1wk																												
27	PAD (TREATMENT BUILDING)	1wk																												
28	DETAILED O & M PLAN	1wk																												
29	TREATMENT BUILDING DELIVERY	1dy																				X 9/14								
30	TREATMENT BUILDING INSTALLATION	1wk																												
31	SITE RESTORATION	1wk																												
32	PUNCH LIST	1dy																					X 9/21							
33	START-UP	3wk																												
34	DEMOBILIZATION	1wk																												
35	FINAL COMPLETION	1dy																									X 10/19			

TABLES

TABLE 1

WELL INSTALLATION DETAILS
PELICAN MANUFACTURING INC.
JAMESTOWN, NEW YORK

Well Number	*Surface Elevation (Ft. AMSL)*	*Bottom Elevation (Ft. AMSL)*	*Total Length*	*Screen Length*	*Riser Length to Ground Surface*
GW-1/VE-1	1316	1306	10	7	3
GW-2/VE-2	1316	1306	10	7	3
GW-3/VE-3	1322	1306	16	13	3
GW-4/VE-4	1323	1306	17	14	3
GW-5/VE-5	1326	1306	20	17	3
VE-6	1316	1310	6	3	3
VE-7	1316	1310	6	3	3
VE-8	1319	1310	9	6	3
VE-9	1320	1310	10	7	3
VE-10	1320	1310	10	7	3
VE-11	1320	1310	10	7	3
VE-12	1321	1310	11	8	3
VE-13	1322	1310	12	9	3
VE-14	1322	1310	12	9	3
VE-14	1323	1310	13	10	3
VE-15	1324	1310	14	11	3
VE-16	1325	1310	15	12	3
VE-17	1325	1310	15	12	3
VE-18	1325	1310	15	12	3
VE-19	1325	1310	15	12	3
VE-20	1325	1310	15	12	3
VE-21	1325	1310	15	12	3

TABLE 2

COMBINED AIR STRIPPER/SVE EMISSION LIMITS
PELICAN MANUFACTURING INC.
JAMESTOWN, NEW YORK

		Expected Emissions		Exhaust Stack Action Levels*		
Compound	*MW*	*lb/hr*	*ppm*	*Level1 ppm*	*Level 2 ppm*	*Level 3 ppm*
Vinyl Chloride**	62.50	0.012	1.28	15	75	200
1,1-Dichloroethene	96.94	0.000	0.01	20	100	200
t-1,2-Dichloroethene	96.94	0.051	3.50	958	1,915	3,830
Trichloroethene	131.39	0.043	2.21	490	2,450	2,589
1,1,2-Trichloroethane	133.40	0.000	0.00	160	800	1,004
Toluene	92.14	0.004	0.28	1,910	2,545	5,090

Notes:

* Level 1: if exceed Level 1, increase monitoring frequency
Level 2: if exceed Level 2, increase monitoring frequency and notify NYSDEC
Level 3: if exceed Level 3, system shutdown

** Total mass of VC on site is estimated to be approximately 2 lbs; therefore, 0.012 is considered to be a conservative estimate.

APPENDIX A

WASTE MANAGEMENT

Procedure Number: 05-572-01

Procedure Name: Waste Management

Effective Date: 11-01-91

Supersedes Procedure Number: N/A

Responsible Positions: General Manager, Project Manager, Environmental Analyst, Health and Safety Coordinator, Operations Manager, Assistant Operations Manager, Supervisor, Warehouse Manager

---

Objective: Establish standard procedures for the proper management of hazardous and nonhazardous waste at a customer's site in accordance with all applicable federal, state, and local regulations.

OUTLINE

Procedure Number: 05-572-01
Procedure Name: Waste Management

I. DISCUSSION

This SOP describes the steps and requirements MARCOR personnel must follow to properly manage a customer's waste both hazardous and nonhazardous.

II. DEFINITIONS

A. RCRA - Resource Conservation and Recovery Act. Passed in 1976 and amended in 1984, this legislation regulated the generation, treatments, storage and disposal of hazardous waste.

B. TCLP - Toxicity Characteristic Leaching Procedure - The testing procedure required to determine if a waste carries any characteristic waste code.

C. TSDF - Treatment, Storage, Disposal Facility.

D. Solid Waste - Any garbage, refuse or sludge, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, agricultural, and mining operations and community activities; excluding material in domestic sewage, discharges subject to regulation as point sources under the Federal Water Pollution Control Act, or any nuclear material regulated under the Atomic Energy Act of 1954.

E. Hazardous Waste - A substance or material, including a hazardous substance, which has been determined by the Secretary of Transportation to be capable of passing an unreasonable risk to health, safety, or the environment.

F. Industrial Waste - Includes anything other than paper or normal "office" (rather than plant) trash.

G. Empty - Removal of all waste that can be removed by normal means leaving less than one (1) inch of residue by weight of the original contents for a container with a capacity less than 110 gallons or 0.3 percent residue by weight for containers over 110 gallons (see 40 CFR 261.7).

H. EPA - Environmental Protection Agency

I. NYSDEC - New York State Department of Environmental Conservation.

Procedure Number: 05-572-01
Procedure Name: Waste Management

III. PROCEDURES

A. Characterize the waste as hazardous or nonhazardous.

Hazardous waste must be disposed of at a TSDF permitted under RCRA. Nonhazardous waste may be disposed of at a state permitted industrial waste disposal facility. The waste must be properly characterized before the correct disposal method and facility can be selected. To determine if waste is hazardous, obtain the following information:

1. Process generating the waste (i.e., spent solvents, off-spec unused material, spill cleanup).

2. Generator's knowledge of hazardous characteristics (i.e. ignitability, corrosivity, reactivity, toxicity).

3. Generator's analysis of the waste.

Waste codes can be assigned to the material using the following criteria:

1. Listed Waste ("F, K, P, U" codes). These codes are from specific processes generating wastes.

   a. F codes - Hazardous Wastes from non-specific sources (40 CFR 261.31).
   b. K codes - Hazardous Wastes from specific sources (40 CFR 261.32).
   c. P and U codes - Discarded commercial chemical products, off specification material, container residues, and spill residues thereof (40 CFR 261.11).

2. Characteristic Wastes (D codes) these codes are assigned to wastes which exhibit any of the following characteristics:

   a. Ignitability D001 (40 CFR 261.21)
   b. Corrosivity D002 (40 CFR 261.22)
   c. Reactivity D003 (40 CFR 261.23)
   d. Toxicity D004 - D043 (40 CFR 261.24) These four characteristics may be determined by generator knowledge or testing.

If the generator has no knowledge of the process generating the waste, listed waste codes cannot be applied (F, K, P, U). TCLP analysis, flash, pH, cyanide and sulfide may be required to assign any characteristic waste codes that may apply.

Nonhazardous waste may be disposed of in a state permitted industrial waste treatment facility. The following procedures are not required for the management of nonhazardous waste, but should be adhered to whenever feasible to ensure the greatest protection to human health and the environment.

B. Package Waste

1. Container Type Selection

Only DOT specification containers may be used for hazardous waste. To select the proper container, use the DOT Hazardous Materials Table found in 49 CFR 172.101. The Hazardous Materials Table identifies regulatory requirements for hazardous material containers. General container requirements include:

a. 17 E - Steel bung drums for non-corrosive liquids, organic liquids.
b. 17 H - Steel open head drums for non-corrosive solids
c. 21 C - Fiber drums for corrosive solids, labpacks for incineration, other solid material.
d. Polyethylene drums for corrosive liquid.

The following procedure may be used to select the proper container for waste accumulation.

a. Select a proper shipping name for the hazardous waste. For example, if the waste generated is spent acetone, look up the word "acetone" in column 2 of the Hazardous Materials Table (49 CFR 172.101). If the hazardous waste is a mixture containing more than one chemical compound or element, use the most descriptive proper shipping name.

b. In column 5 of the Hazardous Materials Table, find the packaging specifications corresponding to the proper shipping name you have selected. Column 5(a) refers to packaging specifications for very

small or limited quantities of hazardous materials. Column 5(b) is routinely used to determine which regulations specify the proper containers that can be used for accumulation and transportation of hazardous waste.

c. Identify the specific packaging requirements and packaging codes for the material in the referenced section of 49 CFR 173.

d. Obtain containers that are marked with one of the specification codes identified in the referenced section of 49 CFR.

If a container is a DOT specification package, somewhere on the container (e.g.., top or bottom) will be a mark with the DOT specification number. This mark indicates the container manufacturer has followed DOT requirements when manufacturing and testing the container.

Single Trip Containers

A container may be marked "NRC" meaning non-reusable container or "STC" meaning single trip container. The implications are the same for containers marked with either acronym. These containers may be reused for the shipment of hazardous waste only if the following conditions are met: the waste must be packaged and offered for transportation, in accordance with DOT regulations, transportation is by highway only, the container may not be offered for transportation less than 24 hours after it is finally closed for transportation, the container must be inspected for leakage immediately before being offered for transportation, each container must be loaded by the shipper and unloaded by the consignee, unless the motor carrier is a private or contract carrier, and unless the container has been reconditioned or altered and retested according to prescribed methods, the container may be reused only once for the transportation of hazardous waste.

Container condition requirements:

a. No rusting
b. No sharp edge, creases or dents
c. No bulging heads
d. No structural defects

If a container does not meet these criteria or begins to leak, the hazardous waste must be immediately transferred to another container or must be overpacked in a salvage drum. Containers with pools of waste on the top are not in good condition and must be decontaminated or overpacked (placed in a larger DOT approved container).

All waste placed in containers must be compatible with the container.

2. Container Management Procedures
A container holding hazardous waste must always be keep closed during accumulation except when it is necessary to add or remove waste from the container. Open head drums are considered to be closed when the lid is placed on the drum, the lid is secured to the drum with a retaining ring or other DOT specification closure device, and the ring is bolted closed.

At accumulation points, containers must not be stored or handled in a manner which may cause them to rupture or leak. The following precautions should be taken at both accumulation points to prevent container ruptures and leaks:

a. Do not overfill container. For example, only fill a 55 gallon drum to 50 gallons. Liquids expand in containers as the temperature increases. A steel drum painted a dark color can easily rise to temperatures above 100°F and the pressure created by the expansion of the liquid causes bulging heads and damages the integrity of the container. Bulging containers also create a safety hazard for personnel expected to add waste to or handle the containers.

b. Protect containers from freezing. Many materials go through a freeze/thaw cycle during changing weather conditions. This freeze/thaw cycle causes metal stress and can result in leaking containers.

c. Ground ignitable hazardous waste to prevent a spark generated by static electricity to ignite flammable vapors which may be present. Use a bonding wire and a ground wire when transferring flammable liquids into containers to prevent sparks caused by

the buildup of static electricity during pouring operations.

d. Handle drums and other containers with equipment designed for the task. Drum grappler attachments may be used for tow motors to securely grab and move containers. Secure containers to pallets before moving pallets. Use drum carts designed for the types of containers used to reduce the likelihood of dropping a container during handling. Never balance drums on the forks of a forklift or tow motor.

3. Special Requirements for Incompatible, Ignitable and Reactive Waters

Special procedures must be followed whenever ignitable, reactive and incompatible wastes are accumulated at accumulation points. Containers accumulating ignitable or reactive waste must be located at least 50 feet away from the facility's property boundary. These containers must also be kept away from sparks, open flames, extreme heat or other sources of ignition.

Prevent hazardous chemical reactions such as heat, fire, explosion, pressure, and the evolution of toxic or flammable decomposition products by not mixing incompatible chemicals in the same container or tank. Incompatible wastes, or incompatible wastes and materials must not be placed in the same container. In addition, hazardous waste must not be placed in an unwashed container that previously held an incompatible waste or material.

At accumulation points and satellite accumulation points, wastes should not be located near anything with which they are incompatible. For example, a container of waste acids should not be located near any aluminum structures or surfaces because contact between acid and aluminum may produce flammable hydrogen gas and could lead to a fire or explosion.

Containers holding hazardous waste which is incompatible with any other wastes or materials present should be physically separated from the other materials by means of a dike, berm or wall.

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4. Management of Empty Containers

All empty containers must be managed to comply with EPA regulations to prevent contamination of the environment from residues left in empty containers.

Possible management methods for empty drums:

1. Reconditioning/reuse
2. Processing for scrap steel recycling
3. Crush and landfill at permitted TSDF
4. Landfill at solid waste disposal facility

A container is not regulated as a hazardous waste if:

a. All waste has been removed, and
b. No more than one inch of residue remains on the bottom of the container, or
c. No more than 3% by weight of the total capacity of the container remains in the container or inner liner if the container is less than or equal to 110 gallons in size, or no more than 0.3% remains if the container is larger than 110 gallons in size.

If the container held acute (P listed) waste to be considered empty, one of the following must occur:

a. The container must be triple rinsed with an appropriate solvent.
b. The container has been cleaned by another method scientifically proven to achieve equivalent removal.
c. The inner liner of the container has been removed.

If containers that held hazardous waste have not been emptied in accordance with this definition, the containers must be managed as hazardous waste.

5. Segregate Waste Types

Different waste types must be segregated to avoid reactions, fires and or explosions. Waste types are generally segregated by hazard class. Hazard classes are defined by the DOT as follows:

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DOT HAZARD CLASSES

Radioactive Material	Any material having a specific activity greater than 0.002 microcuries per gram.
Explosive	Any chemical compound mixture or device, the primary or common purpose of which is to function by explosion or with substantially instantaneous release of gas and heat (unless such compound, mixture or devise is otherwise specifically classified). Explosives are further classified as Group A, B and C.
Poison A	A poisonous gas or liquid of such nature that a very small amount of the gas or vapor of the liquid, mixed with air, is dangerous to life.
Poison B	A liquid, solid, or semi-solid substance which is known to be so toxic to man as to afford a hazard to health during transportation, or is presumed to be toxic to man because laboratory animal tests indicate an oral rat LD_{50} of 50 mg/kg or less, an inhalation rat LC_{50} of 200 mg/liter or less, or a skin absorption rabbit LD_{50} og 2 mg/kg or less.
Flammable Gas	A compressed gas which forms a flammable mixture with air at 13% or less by volume, has a flammability range in air exceeding 12%, or can have significant flame projection beyond the ignition source.

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DOT HAZARD CLASSES, Continued

Non-Flammable Gas	Any other compressed gas such as nitrogen or carbon monoxide which has an absolute pressure exceeding 40 psi at 70° F.
Flammable Liquid	Any liquid having a flash point below 100° F.
Combustible Liquid	Any liquid that does not meet the definitions of other classifications and has a flash point at or above 100° F and below 200° F.
Flammable Solid	Any solid which under conditions normally incident to transportation is liable to cause fires through friction, retained heat from manufacturing, or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious transportation hazard. Spontaneously combustible and water reactive materials are included in this hazard class.
Oxidizer	A substance that yields oxygen readily to stimulate the combustion or organic material. Oxidizers include chemicals such as chlorates, permanganates, inorganic peroxides, and nitrates.
Organic Peroxide	An organic compound containing the bivalent -0-0- structure and which may be considered a derivative of hydrogen peroxide where one or more of the hydrogen atoms have been replaced by organic radicals. Organic peroxides are often temperature sensitive and unstable.

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DOT HAZARD CLASSES, Continued

Corrosive Material	A liquid or solid that causes visible destruction or irreversible alterations in human skin tissue at the site of contact, or in the case of leakage, a liquid that has a sever corrosion rate on steel.
Irritating Material	A liquid or solid substance which upon contact with fire or when exposed to air gives off dangerous or intensely irritating fumes. Examples include tear gas and brombenzylcyanide but not any poisonous materials.
Etiologic Agent	Any viable microorganism or its toxin which causes or may cause human disease. Etiologic agents are listed in 42 CFR 72.25 by the Department of Health and Human Services.
ORMs	Other regulated materials which may pose an unreasonable risk to health and safety or property when transported in commerce and do not meet the definitions of other hazard classes. Specific materials have been classified as ORMs for transportation purposes.
ORM-A	Material which has an anesthetic, irritating, noxious, toxic, or other similar property and which can cause extreme annoyance or discomfort to passengers or crew in the event of leakage.
ORM-B	Material (including a wet solid) capable of causing significant damage to a transport vehicle from leakage during transportation.

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DOT HAZARD CLASSES, Continued

ORM-C	Material which has other inherent characteristics not described by an ORM-A or ORM-B, but which make it unsuitable for shipment, unless properly identified and prepared for transportation.
ORM-D	Materials such as consumer commodities which present limited hazard during transportation due to their form, quantity, and packaging.
ORM-E	Other materials not included in any other hazard class but subject to regulation. Examples include hazardous substances and hazardous wastes.

Wastes consisting of different hazard classes should not be packaged in the same container and the containers should be stored or staged in separate rows.

6. Label Containers

Containers of hazardous waste must have the following labels or markings on them.

a. DOT hazard label (diamond shaped) which describes the hazard class of the material.
   Note: some hazard classes (i.e., combustible liquid, ORM-E, and ORM-A) do not require the DOT label.
b. EPA hazardous waste label which describes the EPA hazardous waste code, generator's name, address and EPA ID#, proper shipping name of the waste, manifest number, and accumulation start date.
c. Waste profile number if required by the TSFD.
d. This End Up labels, if containers are packaged with smaller containers inside.

Containers of nonhazardous waste must be labeled with the following information:

a. Generator's name and address.
b. Description of the waste.
c. Waste profile #, if required by the disposal facility.

Nonhazardous waste labels are available for this information.

C. Generator's Requirements for Accumulation of Hazardous Waste

1. Accumulation Time

Generator's are given 90 days to accumulate drums on-site. The waste must be sent off-site to a permitted TSDF by 90 days. If the generator is a small quantity generator (generates <1000 kg hazardous waste per month), they have 180 days to ship the waste to a permitted TSDF.

2. Satellite Accumulation

A generator may accumulate up to 55 gallons of a waste at the point of generation before the accumulation start time begins.

3. Waste Storage Area

a. Place containers on impervious surface.
b. Containers must not be located near floor drains leading to sanitary or storm water sewers.
c. A containment system must be available to contain the volume of the largest container or 10% of the total volume, whichever is greater.
d. Spilled or leaked waste must be removed as soon as it is accumulated.
e. A fence or chain should be around the area, controlling entry to the storage area.
f. Outdoor containers should be covered with a roof or tarpaulin.
g. Ventilate indoor storage areas.

4. Drum Condition

Wastes must be accumulated in drums which have:

a. No severe rusting
b. No sharp edged creases or dents
c. No bulged heads
d. No structural defects

5. Storage Areas

Must be inspected by the generator weekly for leaks or deterioration. Generator's inspection records must be maintained on-site for at least 3 years from the date of inspection.

D. Select TSDF

After a hazardous waste is consigned to a TSDF, the waste generator retains legal responsibility for the waste. Thus it is important for MARCOR to make responsible recommendations to the generator when selecting the management method for their waste.

First, consider the best and most appropriate management method for the specific waste stream. Consider, in order of preference:

1. Recycling the waste
2. Waste exchange
3. Treatment
4. Incineration
5. Land disposal

Some wastes may only have one method as an option.

When selecting a TSDF, first determine if the TSDF can accept the waste stream. Then evaluate the TSDF on the following:

1. History of Violations - check with the EPA or state waste management agency (NYSDEC) to determine the past and present compliance status of the TSDF.

2. Condition of the Facility - This should be determined by a site visit by MARCOR personnel, if possible. When conducting a site visit note:

   a. General housekeeping
   b. Appearance of waste storage, loading, unloading, and treatment areas.
   c. Potential safety hazards
   d. Condition of facilities and equipment
   e. Availability and use of safety equipment
   d. Detectable odors

3. Cost - This may vary by TSDF, but should be factored in to the selection of the TSDF in order to provide the best value to the customers.

Above all, remember that the generator, when signing the hazardous waste manifest, is certifying that the method the TSDF uses to treat or dispose of the waste are the best available for minimizing the present and future threat of the waste to human health and the environment, and the generator will be held liable for this waste forever. Selecting the appropriate TSDF is vital to the protection of the generator from future liability.

E. Profile Waste into the TSDF

After the disposal facility is selected, most facilities require the waste streams to be profiled into their facility. This is generally true for both hazardous and non-hazardous waste streams.

Waste profiles are specific to the disposal facility. Each facility issues its own profile and may have specific waste acceptance procedures. Check with the TSDF selected for waste profiling and approval procedures.

F. Ship the Waste

1. Nonhazardous waste may be sent to a permitted industrial waste treatment or disposal facility on a standard bill of lading.

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2. Hazardous waste must be shipped on a Uniform Waste Manifest. The manifest is used for 3 purposes.

   a. Tracking shipments of waste.
   b. Provides information during transportation emergencies.
   c. Provides a basis for recordkeeping and reporting.

3. Manifest Selection

   Because different states may use different manifest forms, the RCRA regulations explain how to determine which state's manifest should be used. You must first determine whether or not the state to which the hazardous waste is being sent requires the use of its particular manifest. If the state to which the shipment is being manifested, i.e., the consignment state, requires the use of its own manifest, the consignment state manifest must be used.

   If the consignment state does not require a state manifest, but the state in which the waste was generated, i.e., the generator state, requires its own manifest, the generator's state manifest must be used. The basic form and content of a state manifest is based on EPA's uniform hazardous waste manifest.

   If neither the consignment state nor the generator's state requires the use of its own state manifest, then the uniform hazardous waste manifest may be used.

4. Completion of the Manifest

   There are three parts to a hazardous waste manifest. The top portion identifies the organizations that will be handling the waste; the middle portion identifies the shipment; and the bottom portion contains the signatures of the individuals who handled the waste. A copy of the current version of the Uniform Hazardous Waste Manifest is presented in Attachment 1.

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Instructions for Completion of the Manifest

Item 1. Generator's U.S. EPA ID Number and Manifest Document Number

Enter the generator's unique 12 digit EPA identification number.

Also enter a unique five digit number which the generator assigns to this manifest. Many generators simply number each shipment consecutively. For example, 90001 would represent a shipment on January 1, 1990. All five digits must be entered in this box.

Item 2. Page 1 of

Enter the total number of pages used to complete this manifest. If only the first page is used, enter "1". Continuation sheets must be used if more than four waste types are being shipped to the same TSD facility on the same shipment.

Item 3. Generator's Name and Mailing Address

Enter the name and mailing address of the generator. The address should be the mailing address for the location that will manage the returned manifest forms.

Item 4. Generator's Phone Number

Enter the phone number of an authorized person at the generator's site who can be reached in the event of an emergency.

Item 5. Transporter 1 Company Name

Enter the Company name of the first transporter who will transport the waste off-site.

Item 6. US EPA ID Number

Enter the US EPA twelve digit identification number of the first transporter identified in Item 5.

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Item 7. Transporter 2 Company Name

If a second transporter will be used to transport the waste to the designated TSD facility, enter the name of the second transporter. If more than two transporters are used, the additional transporters must be listed on the continuation sheet. Every transporter used between the generator and the designated facility must be listed.

Item 8. US EPA ID Number

If a second transporter will be used, enter the second transporter's US EPA identification number.

Item 9. Designated Facility Name and Site Address

Enter the company name and the site address of the facility designated to receive the hazardous waste listed on the manifest. The address must be the site address and cannot be a post office box or rural route number.

Item 10. US EPA Identification Number

Enter the U.S. EPA twelve digit number of the designated facility identified in item 9.

Item 11. US DOT Proper Shipping Name, Hazard Class and DOT ID Number

Enter the best and most descriptive DOT proper shipping name, hazard class, and UN or NA DOT identification number. The Hazardous Materials Table and the appendix to the Hazardous Materials Table in 49 CFR 172 provides the information necessary to complete this item.

Item 12. Number and Type of Containers

Enter the number of containers for each waste. Also enter the type of containers by using the appropriate abbreviation from Table 1.

Item 13. Total Quantity

Enter the total quantity, excluding the weight of the packaging, of waste described on each line.

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Item 14. Unit of Measure

Enter the appropriate unit of measure for each waste listed in item 13. Use Table 2 to identify the units of measure. Note that your waste must be measured either by weight or by volume.

TABLE 1 TYPE OF CONTAINERS

Abbreviation	Type of Container
DM	Metal drums, barrels, kegs
DW	Wooden drums, barrels, kegs
DF	Fiberboard or plastic drums, barrels, keg
TP	Portable tanks
TT	Cargo tanks (tank trucks)
TC	Tank cars
DT	Dump trucks
CY	Cylinders
CM	Metal boxes, cartons, cases (including roll-offs)
CW	Wooden boxes, cartons, cases
CF	Fiber or plastic boxes, cartons, cases
BA	Burlap, cloth, paper, or plastic bags

TABLE 2 UNITS OF MEASURE

Abbreviation	Units of Measure
G	Gallons (liquids only)
P	Pounds
T	Tons (2000 pounds)
Y	Cubic yards
L	Liters (liquids only)
K	Kilograms
M	Metric tons (1000 kilograms)
N	Cubic meters

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Item 15. Special Handling Instructions

Use this space to indicate special transportation, treatment, storage, or disposal information or bill of lading information. For example, you may place the waste characterization or profile number assigned to your waste by your TSDF in this space.

Item 16. Special Handling Instructions

The generator must read, sign by hand, and date the certification statement. When the manifest is signed, the person signing it is legally certifying that:

a. The shipment is fully and accurately described on the manifest.
b. The containers are in proper condition for transport
c. A waste minimization program is in place at the facility.
d. The method of treatment, storage, or disposal is the best available to the generator.

Item 17. Transporter 1 Acknowledgement of Receipt of Materials
(Completed by Transporter 1)

The first transporter must print or type the name of the person accepting the waste, sign, and date the manifest to acknowledge receipt of the shipment.

Transporters must then deliver the waste to the next designated transporter (if indicated in Item 7), the designated facility (as indicated in Item 9), or an alternate facility designated by the generator.

Item 18. Transporter 2 Acknowledgement of Receipt of Materials
(Completed by Transporter 2)

If more than one transporter is used, the second transporter must print or type the name of the person accepting the waste, sign, and date the manifest to acknowledge receipt of the shipment from the first transporter.

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Item 19. Discrepancy Indication Space (Completed by TSDF)

The designated TSDF or alternate designated facility must note in this space any significant discrepancies between the quantity or type of waste described on the manifest and the quantity or type of waste actually received at the facility. Significant discrepancies in quantity are, for bulk wastes, variations greater than ten percent by weight. A variation in piece count is considered to be a significant discrepancy for waste delivered in containers. For example, one missing or extra drum in a truckload is a significant discrepancy. Significant discrepancies pertaining to the type of waste would be obvious differences, discovered by the TSD facility, between the type of waste described on the manifest and the type of waste actually received. For example, waste solvent substituted for waste acid, or toxic constituents not reported on the manifest, are significant discrepancies.

Item 20. Facility Owner or Operator Certification of Receipt of Hazardous Materials Covered by this Manifest Except as Noted in Item 19
(Completed by the TSDF)
The owner, operator or authorized representative of the TSDF must print or type his/her name, sign his/her name (by hand), and enter the date. By signing the manifest, the TSDF acknowledges that the waste has been received and accepted, except for any discrepancies noted in Item 19. The TSDF must retain a copy of the manifest and, within 15 days of delivery, send a copy of the closed manifest to the generator.

Items A-K (New York State Requirements)

- Item A: Number preprinted by NYSDEC
- Item B: Generator site address, if different from mailing address
- Item C&E: State of registration and license plate number of waste carrying portion of vehicle
- Item D&F: Telephone number of authorized agent
- Item H: Telephone number at site of TSDF

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- Item I: EPA or state hazardous waste codes
- Item J: If the description in item 11 contains N.O.S. or other general terms, the hazardous waste constituent must be provided here for each waste

- Item K: Assign each material an ultimate disposal method code as follows:
  B = incineration, heat recovery, burning
  L = Landfill
  R = Material recovery of more than 75% of the material
  T = Chemical, physical, or biological treatment

- A copy of the manifest must be sent by the generator to the DEC and postmarked within 5 business days of shipment date. Consignment states hazardous waste management agency.

G. How to Determine US DOT Description for Item 11 of the Manifest

The best and most descriptive DOT proper shipping name must be used for the manifest. Use the DOT Hazardous Materials Table (49 CFR 172.10) to find each shipping name. You should know the following about the waste to determine the DOT description:

1. Process generating the waste
2. Chemical constituents present
3. Concentration of each constituent
4. Physical state (solid, liquid, gas)
5. Specific gravity or density
6. Hazard class
7. Flash point
8. Toxicity of waste or constituents
9. pH
10. Whether the waste is reactive
11. Concentrations of toxic metals
12. Shipment method
13. Amount of waste per container

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H. Land Disposal Restrictions

The EPA has restricted the land disposal of all EPA hazardous wastes. These wastes must be treated to a certain level or with a specified technology before land disposal can occur. 40 CFR Part 268 lists the treatment standards for land disposal restricted (LDR) wastes.

Generator's are required to notify the TSDF when they are shipping LDR wastes to them. Generally, the TSDF provides a form to be completed and sent with each LDR waste manifested into the TSDF. Be certain these forms are completed and attached to the manifest. Give the generator a copy of the form. Failure to submit a LDR form with a shipment can result in the TSDF rejecting the waste and EPA fines being imposed upon the generator.

I. Emergency Response to Hazardous Waste Spills, Fires, Explosions, and Releases

1. Generator's Requirements - A generator of hazardous waste is required to have a current contingency plan on-site which includes the following:

   a. Emergency coordinators names and phone #'s.
   b. Emergency assistance agreements with police and fire departments, local hospitals, contractors, and state and local emergency response teams.
   c. Emergency procedures to be taken in the event of incident.
   d. Emergency equipment location, quantity, capabilities.
   e. Evacuation plan.

2. MARCOR Requirements

   a. Review and become familiar with the generator's contingency plan.
   b. Complete a MARCOR site specific Health and Safety Plan utilizing information from the generator's contingency plan. Refer to MARCOR Procedure 02-150-01 Health and Safety Plan.

3. Reporting Requirements - in the event of a spill, leak, or release of hazardous waste, it is the generator's responsibility to report the incident to the appropriate

agency (i.e., NRC, DEC). To assist the generator with its reporting responsibility, provide the generator with accurate and detailed information on the incident. Include:

a. Name of material released
b. Type of release (air, land, water)
c. Type of incident (fire, spill, reaction, explosion)
d. Emergency response procedures implemented

J. Training Requirements for Handlers of Hazardous Wastes

RCRA requires persons responsible for the management of hazardous wastes to be properly trained. This training must be conducted annually and documented in personnel files. The training must include:

1. How to comply with RCRA hazardous waste regulation and
2. How to implement emergency response procedures.

This training is in addition to OSHA 40 Hour training required in 29 CFR 1910.120 and DOT training required for transportation of Hazardous Materials.

K. Licensing Requirements

Many states require special licenses for transportation of hazardous waste. To obtain a license, contact the Corporate Secretary in Hunt Valley.

The General Manager is responsible to assure that state requirements for getting and maintaining licenses are met. These can include:

1. The license must be in the vehicle.

2. An approved contingency plan for the drivers must be in the vehicle.

3. Instructions on types of hazards to be transported and the states where they may be transported.

4. Compliance with local regulations.

5. Additional registrations, permits and renewals.

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6. The permits must be in the vehicle.

7. Payment of transportation fees.

8. Fling of reports.

APPENDIX A

Please print or type (Form designed for use on elite (12-pitch) typewriter)

Form Approved OMB NO. 2050-0039 Expires 9-30-97

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of	Information in the shaded areas is not required by Federal
3. Generator's Name and Mailing Address			A. State Manifest Document Number	
			B. State Generator's ID	
4. Generator's Phone ( )				
5. Transporter 1 Company Name	6. US EPA ID Number		C. State Transporter's ID	
			D. Transporter's Phone	
7. Transporter 2 Company Name	8. US EPA ID Number		E. State Transporter's ID	
			F. Transporter's Phone	
9. Designated Facility Name and Site Address	10. US EPA ID Number		G. State Facility's ID	
			H. Facility's Phone	

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.					
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above	K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month Day Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month Day Year

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

Procedure Number: 05-574-01

Procedure Name: Handling Drums and Other Containers

Effective Date: 11-01-91

Supersedes Procedure Number:N/A

Responsible Positions: Project Manager, Operations Manager, Site Supervisor, Health and Safety Director, Technicians

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Objective: To set forth standard operating procedures (SOP) for the handling of drums and other containers.

This SOP defines practices and procedures for the safe handling of drums and other hazardous waste and material containers as well as handling of tanks, vaults, vacuum trucks, elevated tanks and compressed gas cylinders.

OUTLINE

I. DISCUSSION

II. PROCEDURES
- Figure 1
- Figure 2

III. REFERENCES

Procedure Number: 05-574-01
Procedure Name: Handling Drums and Other Containers

I. DISCUSSION

Accidents may occur during handling of drums and other hazardous waste containers. Hazards include detonations, fires, explosions, vapor generation, and physical injury resulting from moving heavy containers by hand and working around stacked drums, heavy equipment, and deteriorated drums. While these hazards are always present, proper work practices - such as minimizing handling and using equipment and procedures that isolate workers from hazardous substances - can minimize the risks to site personnel.

Containers are handled during characterization, removal of their contents and during other operations. A flow chart showing procedures for drum handling is given Figure 1. Guidance for safely performing the procedures shown is provided in the following sections of this SOP.

II. PROCEDURES

A. Inspection

The appropriate procedures for handling drums depend on the drum contents. Thus, prior to any handling, drums should be visually inspected to gain as much information as possible about their contents. The inspection crew should look for:

- Symbols, words, or other marks on the drum indicating that its contents are hazardous, e.g., radioactive, explosive, corrosive, toxic, flammable.
- Symbols, words, or other marks on a drum indicating that it contains discarded laboratory chemicals, reagents, or other potentially dangerous materials in small-volume individual containers (see Table 1).
- Signs of deterioration such as corrosion, rust, and leaks.
- Signs that the drum is under pressure such as swelling and bulging.
- Drum type (see Table 1).
- Configuration of the drumhead (see Table 2).

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Conditions in the immediate vicinity of the drums may provide information about drum contents and their associated hazards.

Monitoring should be conducted around the drums using instruments such as a gamma radiation survey instrument, organic vapor monitors, and a combustible gas meter.

The results of this survey can be used to classify the drums into preliminary hazard categories, for example:

- Radioactive
- Leaking/deteriorated
- Bulging
- Explosive/shock-sensitive
- Contains small volume individual containers of laboratory wastes or other dangerous materials.

As a precautionary measure, personnel should assume that unlabelled drums contain hazardous materials until their contents are characterized. Also, they should bear in mind that drums are frequently mislabelled - particularly drums that are reused. Thus, a drum's label may not accurately describe its contents.

If buried drums are suspected, ground-penetrating systems, such as electromagnetic wave, electrical resistivity, ground-penetrating radar, magnetometry, and metal detection, can be used to estimate the location and depth of the drums.

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TABLE 1
SPECIAL DRUM TYPES AND THEIR ASSOCIATED HAZARDS

Polyethylene or PVC-Lined Drums	Often contain strong acids or bases. If the lining is punctured, the substance usually quickly corrodes the steel, resulting in a significant leak or spill.
Exotic Metal Drums (e.g., aluminum, nickel, stainless steel, or other unusual metal)	Very expensive drums that usually contain an extremely dangerous material.
Single-Walled Drums Used as a Pressure Vessel	These drums have fittings for both product filling and placement of an inert gas, such as nitrogen. May contain reactive, flammable, or explosive substances.
Laboratory Packs	Used for disposal of expired chemicals and process samples from university laboratories, hospitals, and similar institutions. Individual containers within the lab pack are often not packed in absorbent material. They may contain incompatible materials, radioisotopes, shock-sensitive, highly volatile, highly corrosive, or very toxic exotic chemicals. Laboratory packs can be an ignition source for fires at hazardous waste sites.

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TABLE 2
INFORMATION PROVIDED BY DRUMHEAD CONFIGURATION

CONFIGURATION	INFORMATION
Whole Lid Removable	Designed to contain solid material.
Has a Bung.	Designed to contain a liquid.
Contains a Liner	May contain a highly corrosive or otherwise hazardous material.

B. Planning

Since drum handling is fraught with danger, every step of the operation should be carefully planned, based on all the information available at the time. The results of the preliminary inspection can be used to determine (1) if any hazards are present and the appropriate response, and (2) which drums need to be moved in order to be opened and samples. A preliminary plan should be developed which specifies the extent of handling necessary, the personnel selected for the job, and the most appropriate procedures based on the hazards associated with the probable drum contents as determined by visual inspection. This plan should be revised as new information is obtained during drum handling.

C. Handling

The purpose of handling is to (1) respond to any obvious problems that might impair worker safety, such as radioactivity, leakage, or the presence of explosive substances, (2) unstack and orient drums for sampling, and (3) if necessary, to organize drums into different areas on site to facilitate characterization and remedial action. Handling may or may not be necessary, depending on how the drums are positioned at the site.

Since accidents occur frequently during handling, particularly initial handling, drums should only be handled if necessary. Prior to handling, all personnel should be warned about the hazards of handling, and instructed to minimize handling as

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much as possible and to avoid unnecessary handling. In all phases of handling, personnel should be alert for new information about potential hazards. These hazards should be responded to before continuing with more routing handling operations. Overpack drums (larger drums in which leaking or damaged drums are placed for storage or shipment (see 49 CFR Part 173.3 (c)) and an adequate volume of absorbent should be kept near areas where minor spills may occur. Where major spills may occur, a containment berm adequate to contain the entire volume of liquid in the drums should be constructed before any handling takes place. If the drum contents spill, personnel trained in spill response should be used to isolate and contain the spill.

Several types of equipment can be used to move drums: (1) a drum grappler attached to a hydraulic excavator, (2) a small front end loader, which can be either loaded manually or equipped with a bucket sling, (3) a rough terrain forklift, (4) a roller conveyor equipped with solid rollers, and (5) drum carts designed specifically for drum handling. Drums are also sometimes moved manually. The drum grappler is the preferred piece of equipment for drum handling.

It keeps the operator removed from the drums so that there is less likelihood of injury if the drums detonate or rupture. If a drum is leaking, the operator can stop the leak by rotating the drum and immediately placing it into an overpack. In case of an explosion, grappler claws help protect the operator by partially deflecting the force of the explosion.

The following procedures can be used to maximize worker safety during drum handling and movement.

- Train personnel in proper lifting and moving techniques to prevent back injuries.

- Make sure the vehicle selected has sufficient rated load capacity to handle the anticipated loads, and make sure the vehicle can operate smoothly on the available road surface.

- Air condition the cabs of vehicles to increase operator efficiency; protect the operator with heavy splash shields.

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- Supply operators with appropriate respiratory protective equipment when needed. Normally either a combination SCBA/SAR with the air tank fastened to the vehicle, or an airline respirator and an escape SCBA are used because of the high potential hazards of drum handling. This improves operator efficiency and provides protection in case the operator must abandon the equipment.

- Have overpacks ready before any attempt is made to move drums.

- Before moving anything, determine the most appropriate sequence in which the various drums and other containers should be moved. For example, small containers may have to be removed first to permit heavy equipment to enter and move the drums.

- Exercise extreme caution in handling drums that are not intact and tightly sealed.

- Ensure that operators have a clear view of the roadway when carrying drums. Where necessary, have ground workers available to guide the operator's motion.

Drums Containing Radioactive Waste

- If the drum exhibits radiation levels above background immediately contact a health physicist. Do not handle any drums that are determined to be radioactive until persons with expertise in this area have been consulted.

Drums that May Contain Explosive or Shock-Sensitive Waste

- If a drum is suspected to contain explosive or shock-sensitive waste as determined by visual inspection, seek specialized assistance before any handling.

- If handling is necessary, handle these drums with extreme caution.

- Prior to handling these drums, make sure all non-essential personnel have moved a safe distance away.

- Use a grappler unit constructed for explosive containment for initial handling of such drums.

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- Palletize the drums prior to transport. Secure drums to pallets.

- Use an audible siren signal system, similar to that employed in conventional blasting operations, to signal the commencement and completion of explosive waste handling activities.

- Maintain continuous communication with the Site Safety Officer and/or the company post until drum handling operations are complete.

Bulging Drums

- Pressurized drums are extremely hazardous. Wherever possible, do not move drums that may be under internal pressure, as evidenced by bulging or swelling.

- If a pressurized drum has to be moved, whenever possible handle the drum with a grappler unit constructed for explosive containment. Either move the bulged drum only as far as necessary to allow seating on firm ground, or carefully overpack the drum. Exercise extreme caution when working with or adjacent to potentially pressurized drums.

Drums Containing Packaged Laboratory Wastes (Lab Packs)

Laboratory packs (i.e., drums containing individual containers of laboratory materials normally surrounded by cushioning absorbent material) can be an ignition source for fires at hazardous waste sites. They sometimes contain shock-sensitive materials. Such containers should be considered to hold explosive or shock-sensitive wastes until otherwise characterized. If handling is required, the following precautions are among those that should be taken:

- Prior to handling or transporting lab packs, make sure all non-essential personnel have moved a safe distance away.

- Whenever possible, use a grappler unit constructed for explosive containment for initial handling of such drums.

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- Maintain continuous communication with the Site Safety Officer and/or the command post until handling operations are complete.

- Once a lab pack has been opened, have a chemist inspect, classify, and segregate the bottles within it, without opening them, according to the hazards of the wastes. An example of a system for classifying lab pack wastes is provided in Table 3. The objective of a classification system is to ensure safe segregation of the lab packs contents. Pack these bottles with sufficient cushioning and absorption materials to prevent excessive movement of the bottles and to absorb all free liquids, and ship them to an approved disposal facility.

- If crystalline material is noted at the neck of any bottle, handle it as a shock-sensitive waste, due to the potential presence of picric acid or other similar material, and get expert advice before attempting to handle it.

- Palletize the repacked drums prior to transport. Secure the drums to pallets.

Leaking, Open and Deteriorated Drums

- If a drum containing a liquid cannot be moved without rupture, immediately transfer its contents to a sound drum using a pump designated for transferring that liquid.

- Using a drum grappler, place immediately in overpack containers:

  Leaking drums that contain sludges or semi-solids.
  Open drums that contain liquid or solid waste.
  Deteriorated drums that can be moved without rupture.

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TABLE 3
EXAMPLE OF LAB PACK CONTENT CLASSIFICATION SYSTEM FOR DISPOSAL

Classification	Examples
Inorganic Acids	Hydrochloric Sulfuric
Inorganic Bases	Sodium Hydroxide Potassium Hydroxide
Strong Oxidizing Agents	Ammonium Nitrate Barium Nitrate Sodium Chlorate Sodium Peroxide
Strong Reducing Agents	Sodium Thiosulfate Oxalic Acid Sodium Sulphite
Anhydrous Organics and Organometallics	Tetraethyl Lead Phenylmercuric Chloride
Anhydrous Inorganics and Metal Hydrides	Potassium Hydride Sodium Hydride Sodium Metal Potassium
Toxic Organics	PCBs Insecticides
Flammable Organics	Hexane Toluene Acetone
Inorganics	Sodium Carbonate Potassium Chloride
Inorganic Cyanides	Potassium Cyanide Sodium Cyanide Copper Cyanide

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Classification	Examples
Organic Cyanides	Cyanoacetamide
Toxic Metals	Arsenic Cadmium Lead Mercury

Buried Drums

- Prior to initiating subsurface excavation, use ground penetrating systems to estimate the location and depth of the drums.

- Remove soil with great caution to minimize the potential for drum rupture. All excavation work should be performed with non-sparking tools. All personal performing this task should be in Level A protective gear.

- Have dry chemical fire extinguishers on hand to control small fires. (Minimum of 2 fire extinguishers).

D. Opening

Drums are usually opened and sampled in place during site investigations. However, remedial and emergency operations may require a separate drum opening area. Procedures for opening drums are the same, regardless of where the drums are opened. To enhance the efficiency and safety of drum opening personnel, the following procedures should be instituted.

- If a supplied air respiratory protection system is used, place a bank of air cylinders outside the work area and supply air to the operators via airlines and escape SCBA's. This enables workers to operate in relative comfort for extended periods of time.

- Protect personnel by keeping them at a safe distance from the drums being opened. If personnel must be located near the drums, place explosion resistant plastic shields between them and the drums to protect them in case of detonation. Locate controls for drum opening equipment, monitoring equipment, and fire suppression equipment behind the explosion resistant plastic shield.

- If possible, monitor continuously during opening. Place sensors of monitoring equipment, such as colorimetric tubes, dosimeters, radiation survey instruments, explosion meters, organic vapor analyzers, and oxygen meters, as close as possible to the source of contaminants, i.e. at the drum opening.

- Use the following remote controlled devices for opening drums:

  Pneumatically operated impact wrench to remove drum bungs
  Hydraulically or pneumatically operated drum piercers
  Backhoes equipped with bronze spikes for penetrating drum tops in large scale operations

- Do not use picks, chisels and firearms to open drums.

- Hang or balance the drum opening equipment to minimize worker exertion.

- If the drum shows signs of swelling or bulging, perform all steps slowly. Relieve excess pressure prior to opening and, if possible, from a remote location using such devices as a pneumatic impact wrench or hydraulic penetration device. If pressure must be relieved manually, place a barrier such as explosion resistant plastic sheeting between the worker and bung to deflect any gas, liquid, or solids which may be expelled as the bung is loosened.

- Open exotic metal drums and polyethylene or polyvinyl chloride lined (PVC lined) drums through the bung by removal or drilling. Exercise extreme caution when manipulating these containers.

- Do not open or sample individual containers within laboratory packs.

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- Reseal open bungs and drill openings as soon as possible with new bungs or plugs to avoid explosions and/or vapor generation. If an open drum cannot be resealed, place the drum into an overpack. Plug any openings in pressurized drums with pressure venting caps set to a 5 psi (pounds per square inch) release to allow venting of vapor pressure.

- Decontaminate equipment after each use to avoid mixing incompatible wastes.

E. Sampling

Drum sampling can be one of the most hazardous activities to worker safety and health because it often involves direct contact with unidentified wastes. Prior to collecting any sample, develop a sampling plan:

- Research background information about the waste.

- Determine which drums should be sampled.

- Select the appropriate sampling device(s) and container(s).

- Develop a sampling plan which includes the number, volume, and location of samples to be taken.

- Develop Standard Operating Procedures for opening drums, sampling, and sample packaging and transportation.

- Have a trained health and safety professional determine, based on available information about the wastes and site conditions, the appropriate personal protection to be used during sampling, decontamination, and packaging of samples.

When manually sampling from a drum, use the following techniques:

- Keep sampling personnel at a safe distance while drums are being opened. Sample only after opening operations are complete.

- **A final staging area**, also known as the bulking area, where substances that have been characterized are bulked for transport to treatment or disposal facilities.

  Locate the final staging area as close as possible to the site's exit.

  Grade the area and cover it with plastic sheeting.

  Construct approximately 1 foot high (0.3-m-high) dikes around the entire area.

  Segregate drums according to their basic chemical categories (acids, heavy metals, pesticides, etc.) as determined by characterization. Construct separate areas for each type of waste present to preclude the possibility of intermingling incompatible chemicals when bulking.

In all staging areas, stage the drums two wide in two rows per area and space these rows 7 to 8 feet (2 to 2.5 m) apart to enable movement of the drum handling equipment.

H. Bulking

Wastes that have been characterized are often mixed together and placed in bulk containers such as tanks or vacuum trucks for shipment to treatment or disposal facilities. This increases the efficiency of transportation. Bulking should be performed only after thorough waste characterization by trained and experienced personnel. The preliminary tests described earlier under Characterization provide only a general indication of the nature of the individual wastes. In most cases, additional sampling and analysis to further characterize the wastes, and compatibility tests (in which small quantities of different wastes are mixed together under controlled conditions and observed for signs of incapatibility such as vapor generation and heat of reaction) should be conducted. Bulking is performed at the final staging area using the following procedures:

- Inspect each tank trailer and remove any residual materials from the trailer prior to transferring any bulked materials. This will prevent reactions between incompatible chemicals.

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- To move hazardous liquids, use pumps that are properly rated (see National Fire Protection Association [NFPA] 70 Articles 500-503 and NFPA 497M) and that have a safety relief valve with a splash shield. Make sure that pump hoses, casings, fittings, and gaskets are compatible with the material being pumped.

- Inspect hose lines before beginning work to ensure that all lines, fittings, and valves are intact with no weak spots.

- Take special precautions when handling hoses as they often contain residual material that can splash or spill on the personnel operating the hoses. Protect personnel against accidental splashing. Protect lines from vehicular and pedestrian traffic.

- Store flammable liquids in approved containers.

I. Shipment

Shipment of materials to offsite treatment, storage or disposal facilities involves the entry of waste hauling vehicles into the site. U.S. Department of Transportation (DOT) regulations (49 CFR Parts 171-178) and EPA regulations (40 CFR Part 263) for shipment of hazardous wastes must be complied with. Also, refer to MARCOR Procedure No. 05-570-01 on Transportation of Waste and Procedure No. 05-572-01 on Waste Management. The following guidelines can enhance the safety of these operations:

- Locate the final staging (bulking) area as close as possible to site exit.

- Prepare a circulation plan that minimized conflict between cleanup teams and waste haulers. Install traffic signs, lights, and other control devices as necessary.

- Provide adequate area for onsite and hauling vehicles to turn around. Where necessary, build or improve onsite roads.

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- Stage hauling vehicles in a safe area until ready for loading with drivers remaining in cab. Minimize the time that drivers spend in hazardous areas.

- Outfit the driver with appropriate protective equipment.

- If drums are shipped, tightly seal the drums prior to loading. Overpack leaking or deteriorated drums prior to shipment. (Under most circumstances, overpack drums used for hazardous wastes may not be reused [49 CFR Part 173.3 (c)]. Make sure that truck bed and walls are clean and smooth to prevent damage to drums. Do not double stack drums. Secure drums to prevent shifting during transport.

- Keep bulk solids several inches below the top of the truck container. Cover loads with a tarp. Secure the load to prevent shifting or release during transport. Never exceed the maximum weight limits for any bulk load.

- Weigh vehicles periodically to ensure that vehicle and road weight limits are not exceeded.

- Decontaminate vehicles tires prior to leaving the site to ensure that contamination is not carried onto public roads.

- Check periodically to ensure that vehicles are not releasing dust or vapor emissions off site.

- Develop procedures for responding quickly to offsite vehicle breakdown and accidents to ensure minimal public impact.

J. Special Case Problems

For tanks and vaults, which are often found on hazardous waste sites, the following procedures are recommended:

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- In general, when opening a tank or vault follow the same procedures as for a sealed drum. If necessary, vent excess pressure if volatile substances are stored. Place deflecting shields between workers and the opening to prevent direct contamination of workers by materials forced out by pressure when the tank is opened. See Procedure No. 05-510-01 on Underground Storage Tank Removal.

- Guard manholes or access portals to prevent personnel from falling into the tank.

- Identify the contents through sampling and analysis. If characterization indicates that the contents can be safely moved with the available equipment, vacuum them into a trailer for transportation to a disposal or recycling facility.

- Empty and decontaminate the tank or vault before disposal.

- If it is necessary to enter a tank or vault (i.e., confined spaces) for any reason (e.g., to clean off solid materials or sludges on the bottom or sides of the tank of vault), MARCOR procedure 02-120-01 Confined Space must be followed.

Vacuum Trucks

- Wear appropriate protective clothing and equipment when opening the hatch.

- If possible, use mobile steps or suitable scaffolding consistent with 29 CFR Part 1910, Subpart D. Avoid climbing up the ladder and walking across the tank catwalk.

- If the truck must be climbed, raise and lower equipment and samples in carriers to enable workers to use two hands while climbing.

- If possible, sample from the top of the vehicle. If it is necessary to sample from the drain spigot, take steps to prevent spraying of excessive substances. Have all personnel stand off to the side. Have sorbent materials on hand in the event of a spill.

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Elevated Tanks

In general, observe the safety precautions described for vacuum trucks. In addition:

- Use a safety line and harness.
- Maintain ladders and railings in accordance with OSHA requirements (29 CFR Part 1910, Subpart D).

Compressed Gas Cylinders

- Obtain expert assistance in moving and disposing of compressed gas cylinders.
- Handle compressed gas cylinders with extreme caution. The rupture of a cylinder may result in an explosion, and the cylinder may become a dangerous projectile.
- Record the identification numbers on the cylinders to aid in characterizing their contents.

Ponds and Lagoons

- Drowning is a very real danger for personnel suited in protective equipment because the weight of protective equipment increases an individual's overall density and severely impairs their swimming ability. Where there is danger of drowning, provide necessary safety gear such as lifeboats, tag lines, railings, nets, safety harnesses, and flotation gear.
- Wherever possible, stay on shore. Avoid going out over the water.
- Be aware that some solid wastes may float and give the appearance of solid cracked mud. Caution should be exercised when working along shorelines.

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IV. REFERENCES

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3. U.S. EPA. 1984. Characterization of Hazardous Waste Sites - A methods Manual; Volume II. Available Sampling Methods. Second edition. EPA 600/4-84-076.

4. NIOSH. 1979. Criteria for a Recommended Standard: Working in Confined Spaces. NIOSH No. 80-106. Also available from US Government Printing Office (#017-033-00353-0) and National Technical Information Service (PB-80-183015).

APPENDIX B

EMERGENCY ACTION PLAN

MARCOR Remediation, Inc.
Waste Transportation/Emergency Spill Response Plan
Pelican Manufacturing Site
Jamestown, New York

1.0 INTRODUCTION

The Emergency Action Plan (EAP) presented herein presents pertinent information and notification procedures which are to be implemented during any emergency response action which may be necessary during the transportation of remedial waste which is being transported for disposal from the Pelican Manufacturing Site in Jamestown, New York.

There are 10 drums of waste material, each weighing approximately 500 lbs, to be shipped over the highway. These waste materials are potentially contaminated with volatile organic compounds (VOCs).

MARCOR Remediation, Inc. (MARCOR) will be responsible for the transportation of the 10 drums of waste material. This waste material will be disposed of at the Chemical Waste Management, Inc. facility in Model City, New York. Transportation of the drums will be direct via truck to the disposal facility.

2.0 EMERGENCY RESPONSE

In the event of an emergency situation, it will be the responsibility of MARCOR to provide the resources necessary to conduct an effective emergency response including spill cleanup. After an emergency has occurred, (i.e., truck rollover) the following procedures are to be followed:

I) Notification will come into MARCOR (716) 447-0700. This call will be made by the local community responders where the emergency has occurred. MARCOR will provide a description of the material and emergency procedures dealing with first aid and spills. This information is also available with the manifest of each shipment. The DOT Emergency Response Guide No. 31 is recommended for any emergency response. Supplemental response information is as follows:

a.) Isolate the immediate area and downwind area.

b.) Some drums may have elevated levels of organics. Responders may use the respiratory action levels recommended by the United States Environmental Protection Agency (USEPA) for dealing with unknowns. Full face piece air purifying respirators equipped with a combination cartridge for organic vapors/acid gases and a high efficiency particulate air (HEPA) filter may be worn if organic vapors are between 1 and 5 parts per

million (ppm) In worker breathing zones. Supplied air respirators should be worn for levels above 5 ppm.

c.) Waste material may be covered with polyethylene sheeting to contain vapors and particulate excursions until the emergency spill response contractor has arrived on-scene.

d.) Polycoated tyvek or saranex full body protective clothing should be worn with chemical resistant inner disposable gloves, chemical resistant outer gloves (e.g., nitrile), and rubber or neoprene boots should be worn. Ankle and wrist joints should be secured with duct tape.

II.) MARCOR, after receiving notification, will then contact the following:

a.) NYSDEC Region 9 Spill Response (716) 871-7220

b.) Client (CRA Services) (716) 297-6150

The MARCOR Project Manager will also make the following notifications, as appropriate:

a.)	Hazmat, Inc. (For truck loads of drums)	716-827-7200
b.)	Conrail (uses Chemtrec)	800-424-9300
c.)	Union Pacific (uses Chemtrec)	800-424-9300
d.)	Rollins Environmental (uses National Spill Center) (for truck loads of bags)	800-456-9038

(Note: Also notify Tom Cessario from Rollins for any spill:
Office: 302-426-3557
Home: 610-274-0703
Beeper: 800-946-4646
Pin No.: 1101881

The MARCOR Project Manager will then contact the appropriate transporter to confirm that spill response activities have commenced and obtain the specifics of the emergency so that the phone calls to the National Spill Response Center and appropriate State Emergency Response Commission can be made. The MARCOR Project Manager will then contact the National Spill Response Center at 800-424-8802 and the appropriate State Emergency Response Commission to report the emergency if a release has occurred. Table 2 provides a list of the potential State Emergency Response Commissions.

All spill cleanup activities will be conducted in accordance with the Emergency Spill Contractor's Health and Safety Plan.

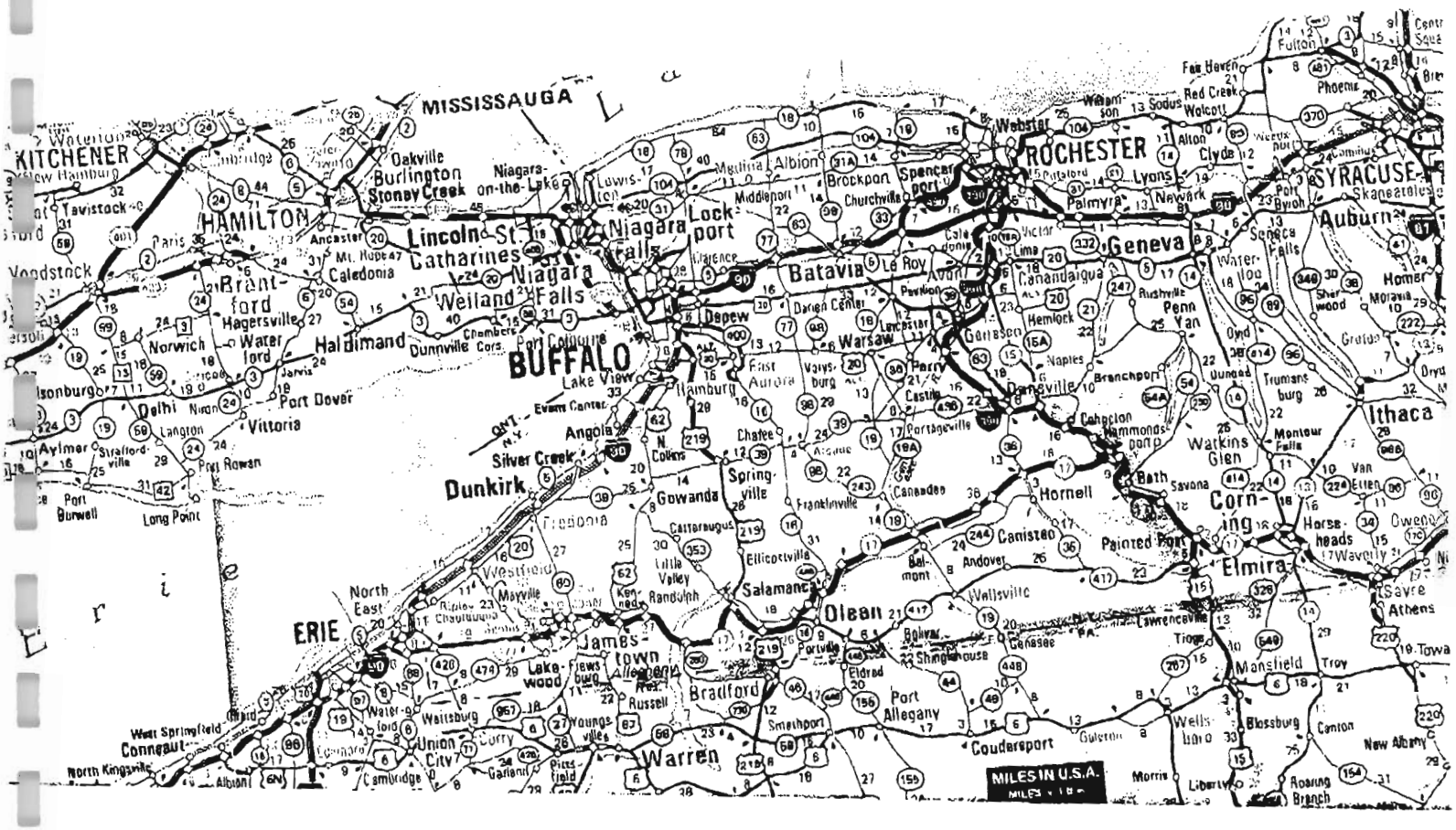
TABLE 1
LIST OF STATE EMERGENCY RESPONSE COMMISSIONS

Alabama	205-834-1375
Arizona	602-231-6326
Arkansas	501-562-7444
Colorado	303-331-4830
Georgia	404-656-4713
Idaho	208-334-5888
Illinois	217-782-4694
Indiana	317-243-5176
Iowa	515-281-3231
Kansas	913-296-1690
Kentucky	502-564-8660
Louisiana	504-925-6113
Michigan	517-373-8481
Minnesota	612-643-3000
Mississippi	601-960-9973
Missouri	314-751-7929
Montana	406-444-6911
Nebraska	402-471-2186
Nevada	702-885-5300
New Jersey	609-292-6714
New York	513-457-9996
North Carolina	919-733-3867
Ohio	614-644-2260
Oklahoma	405-521-2481
Pennsylvania	717-783-8150
South Carolina	803-734-0425
South Dakota	605-773-3151
Tennessee	615-252-3300
Texas	512-465-2138
Utah	801-584-8370
Virginia	804-225-2513
West Virginia	304-348-5380
Wisconsin	608-266-3232
Wyoming	307-777-7566

Note: When speaking with a State Representative, inquire if the phone call you are making with them meets all of the State reporting requirements. If not, follow up as appropriate.

APPENDIX C

EMERGENCY RESPONSE INFORMATION FOR TRUCK TRANSPORTATION



DIRECTIONS TO CWM MODEL CITY LANDFILL

- Rt. 60 North out of Jamestown
-Rt. 60 North to Rt. 90 East
- Rt. 90 East to Rt. 190 North
- Rt. 190 North to Rt. 104 East
- Rt. 104 East to Rt. 18North
- Rt. 18 North to Balmer Road
- Right on Balmer Road to CWM.

Emergency Response Contractors and Response Location

MARCOR Remediation, Inc.

Buffalo, New York	Kevin Thompson	(716) 447-0700
NationWide	Ron Acee / Mike Wyatt	(800) 547-0128

Guardian, Inc.

Delaware	Bear	1-800-345-4395

React, Inc.

Pennsylvannia	Philadelphia	215-729-2777