XEROX

Xerox Corporation
Joseph C. Wilson Center for Technology
Webster, New York 14580

August 26, 1996

RECEIVED
SEP 03 1996
ENVIRONMENTAL ENGINEERING

Ms. Denise M. Radtke
Engineering Geologist
NYSDEC
50 Wolf Road
Albany, New York 12233-0001

Dear Denise,

In response to your letter of August 1st, please note the following items intended to be an Addendum to the Corrective Measures Implementation report dated January, 1996. The purpose of this Addendum is to make revisions to the Corrective Measures Implementation report to accommodate the items mentioned in your letter.

Please let me know if you have any questions.

Very truly yours,

Robert E. Heeks

Robert E. Heeks, Ph.D.
Project Manager

REH:bw
Attachments

c: C. Amento, NYSDOH
R. Basso, NYSDEC
M. Bonn, Haley and Aldrich
K. Eckweiler, Xerox
R. Elliott, c/o E. Yurkstas, MCDOH
J. MacKenzie, Xerox
E. Miles, NYSDEC
R. Murphy
J. Reidy, EPA
D. Rollins, NYSDEC, Avon
L. Smith, Haley and Aldrich

CMI ADDENDUM

OB-97 REC 1

The following items are presented as an Addendum to the Corrective Measures Implementation Report OB-97 dated January 1996.

In discussing this Addendum, it should be noted that the CMI was preceded by the RFI and CMS for the OB-97 investigative area. These were approved in a letter to R. Heeks from Messers. Dassatti and Bellina dated September 26, 1995. Therefore, items required by the RFI and CMS will not be addressed at this time. Xerox understood the letter of June 28th, 1995 from Messrs. Counterman and Bellina granted permission to implement the design approved by the NYSDEC. The topics listed below are in response to comments by Denise Radtke relative to the CMI for the OB-97 remediation activity in a letter to R. Heeks dated 8/1/96. The CMI report was submitted to the NYSDEC in January, 1996 to summarize implementation of the recovery well that occurred in the fall of 1995.

- **STATEMENT OF CORRECTIVE MEASURES OBJECTIVES:**

  See OB-97 Investigative Area, Corrective Measures Study Report, April 1995, Page 4.

- **PROGRAM MANAGEMENT PLAN WHICH INCLUDES:**

  - Management Strategy
  - The responsibilities and authorities of all organizations and key personnel involved with the implementations.
  - Names and titles of key personnel.

MANAGEMENT STRATEGY

The management strategy is the utilization of solar power to provide energy for pumping Well OB-97 REC 1. This is being done owing to the remote location of the well which has no near-by utilities. The well will pump approximately six months of the year and avoid freezing as well as recognize safety problems in reaching the well under snowy conditions. The ultimate strategy is to remove and treat groundwater contaminated with chlorinated hydrocarbons.

KEY PERSONNEL AND RESPONSIBILITIES

(See Attached)

The Project Manager for Xerox Corporation is Robert Heeks whose responsibility is to oversee and implement remediation.

Xerox Environmental Engineering interfaces with the Agencies regarding Permits. Joe Posick works with the SPDES personnel.

Margaret Bonn of Haley and Aldrich of New York is the Consultant Project Manager. Her responsibility is to support the technology and regulatory aspects of the remediation.

Analytical work will be performed by Columbia Analytical Services. Contact is Lorie Croston.

The Xerox Field Representative, Foreman, is Tracy Wahl. Her responsibility is to maintain operation of the well on a day to day basis and coordinate problem solving activities.

Tracy interfaces with Xerox Maintenance and Safety in problem solving activities. She also works with the Safety Representative, Steve Drago.

- **A CORRECTIVE MEASURES DESIGN WHICH ADDRESSES ALL ITEMS PRESENTED IN ATTACHMENT C OF THE PERMIT MODULE III.**

The approved Corrective Measures Design is shown in Appendix A of the report titled Corrective Measures Implementation Report, OB-97, SWMU 96, Xerox Corporation, Webster, New York, January, 1996.

A. The approved Design, Plans and specifications are described in Appendix A of report titled Corrective Measures Implementation Report, OB-97, SWMU 96, Xerox Corporation, Webster, New York, January 1996.

B. OPERATION AND MAINTENANCE PLAN

1 thru 4 Please reference attached O&M Plan. Refer to CMI report, 1-96 Appendix B for SPDES testing requirements.

5 See enclosed Health and Safety Plan. This is the Salt Road Health and Safety Plan and it is applied also to the OB-97 area.

6 See Appendix A in the Corrective Measures Implementation Report, OB-97, SWMU 96, January, 1996 Appendix A. Also see the O&M report enclosed.

7 Operating logs are maintained to provide routine operation of flow rate and make note of any equipment malfunctions. Laboratory records are kept in files and presented in the site wide Semi-Annual report. An example of the data is shown in Appendix C of the CMI report, dated January 1996.

a. Personnel and Maintenance records are recorded in daily reports by the foreman.

b. Records are maintained by the Project Manager, Foreman, Consultant and Analytical Laboratory. Semi - Annual reports are submitted to the State Agencies as required by the Permit.

c. Cost records are maintained by the Project Manager and the Control group..

C. COST ESTIMATE

The project has been implemented and Xerox will continue to support the work financially.

D. THE PROJECT SCHEDULE

Implementation of the project is complete. The system is currently is operational.

E. CONSTRUCTION AND QUALITY ASSURANCE OBJECTIVES

See Sampling and Analysis Plan, OB-97 Investigative area, April, 1995, p1. Construction of Corrective Measures is completed. The objective is to provide an operational recovery well that will purify groundwater to drinking water standards.

F. HEALTH AND SAFETY PLAN

OB-97 REC 1 is covered by the Salt Road Health and Safety Plan - (Attached).

G. DESIGN PHASE

1 - 3 is complete.

4. EQUIPMENT STARTUP AND OPERATING TRAINING

Complete.

5. ADDITIONAL STUDIES

Additional studies in regard to reducing pore size of the filtration system have been conducted. Purpose was to reduce iron levels in the effluent. It has been determined that the iron is in solution therefore, additional filtration will not solve the problem of effluent iron levels beyond the SPDES limit of 1.2 mg/1. A Permit modification has been discussed with NYSDEC.

6. PRE FINAL AND FINAL DESIGN

Complete.

PP19 - 21 OF THE PERMIT - (See D. Radtke letter to R. Heeks dated 8/1/96)

4. CORRECTIVE MEASURES IMPLEMENTATION PLAN

The design and construction are completed. Operation and Maintenance will be under the attention of the Field Engineer, (Foreman,) Tracy Wahl at the present time. Monitoring will be performed by Columbia Analytical Services. Consulting services will be supplied by Haley and Aldrich of New York.

The approved design is presented in Appendix A of the Corrective Measures Implementation Report, dated January, 1996.

4b. SUBSEQUENT ACTIVITIES

Not applicable unless desired by the DEC.

4c. FINANCIAL ASSURANCE

Financial Assurance was submitted in a letter, copy enclosed, to Ms. Denise Radtke from K. Whalen of Xerox. Financial Assurance for OB-97 REC 1 is being included with that provided for other SWMUS at the Webster site.

- **OPERATION AND MAINTENANCE PLAN**

See enclosed.

- **CONSTRUCTION AND QUALITY ASSURANCE PLAN**

See Appendix A in the Corrective Measures Implementation Report, OB-97, Xerox Corporation, Webster, New York, January, 1996.

- **HEALTH AND SAFETY PLAN**

See enclosed.

- **RECORDS AND REPORTING**

Testing will be done and reports handled according to the SPDES Permit as shown in Appendix B of the OB-97, Corrective Measures Implementation Report, dated January, 1996.

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The approved design is presented in Appendix A of the Corrective Measures Implementation Report, dated January, 1996.

4b. SUBSEQUENT ACTIVITIES

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4c. FINANCIAL ASSURANCE

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- **RECORDS AND REPORTING**

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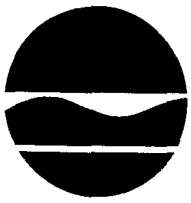
New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7252
518-457-9253 FAX 518-457-9240



Michael Zagata
Commissioner

RECEIVED
AUG 8 REC'D
Environmental Engineering

August 1, 1996

Dr. Robert Heeks
Xerox Corporation
800 Phillips Road
Webster, New York 14580

Dear Dr. Heeks:

Re: OB-97 Investigative Area

The New York State Department of Environmental Conservation and the United States Environmental Protection Agency have reviewed Xerox's Corrective Measures Implementation Report (CMI), dated January, 1996.

Although the Report has presented an adequate description of several aspects of the Corrective Measures Implementation, the document has not fulfilled all requirements as outlined in Xerox's 373-2 and HSWA Hazardous Waste Management Permits. Please refer to Attachment I which contains a copy of the applicable portions of the 373-2 Permit.

Attachment II provides a list of items that were not included or addressed in the CMI Report.

Please note that it may be possible for Xerox to satisfy some of these requirements by referencing an existing Plan. Also, if certain Report requirements are not applicable to the subject activities, this should be stated or discussed in the Report.

Please provide a revised CMI Report to the Agencies as soon as possible.

If you have questions concerning this letter, they may be addressed to Ms. Denise Radtke at (518)457-9253.

Sincerely,

Denise M. Radtke

Denise M. Radtke
Senior Engineering Geologist
Bureau of Hazardous Waste
Facilities

DMR for RB

Ray Basso
Chief, RCRA Programs Branch
Environmental Planning and
Protection Division

cc: E. Miles
R. Murphy
D. Rollins
C. Amento
J. Reidy

ATTACHMENT C

RCRA CORRECTIVE MEASURE DESIGN
SUBMITTAL REQUIREMENTS

The Permittee shall prepare final construction plans and specifications to implement the corrective measure(s) at the facility as stipulated by the Commissioner.

A. Design Plans and Specifications

Where applicable, the Permittee shall develop clear and comprehensive design plans and specifications which include but are not limited to the following:

1. Discussion of the design strategy and the design basis, including;

   a. Compliance with all applicable or relevant environmental and public health standards; and

   b. Minimization of environmental and public impacts.

2. Discussion of the technical factors of importance including;

   a. Use of currently acceptance environmental control measures and technology;

   b. The contractibility of the design; and

   c. Use of currently acceptable construction practices and techniques.

3. Description of assumptions made and detailed justification of these assumptions;

4. Discussion of the possible sources of error and references to possible operation and maintenance problems;

5. Detailed drawings of the proposed design including;

   a. Qualitative flow sheets; and

   b. Quantitative flow sheets.

6. Proposed equipment to be used and the equipment specifications;

7. Tables giving material and energy balances;

8. Appendices including;

the Commissioner according to a schedule specified by the Department not to exceed thirty-five (35) days after Permittee's receipt of Report comments from the Commissioner); and

(f) The Commissioner shall select a remedy from the remedial alternatives evaluated in the Corrective Measures Study (CMS), required in Module Condition E.3.(d) that will (1) be protective of human health and the environment; (2) meet the concentration levels of hazardous constituents in each medium that the remedy must achieve to be protective of human health and the environment; (3) control the source(s) of release(s) so as to reduce or eliminate, to the maximum extent practicable, further releases that might pose a threat to human health and the environment; and (4) meet all applicable waste management requirements. In making its selection the Commissioner, while not bound thereby, will take into account the comments and concerns about the selection of a final remedial alternative raised in writing by Permittee.

4. CORRECTIVE MEASURES IMPLEMENTATION PLAN.

(a) Within one hundred-twenty (120) days after receipt of the Commissioner's written approval for the final CMS Report and a notification by the Commissioner approving the corrective measure(s), the Permittee shall submit to the Commissioner a Corrective Measure Implementation (CMI) Plan. Depending upon the complexity of potential corrective measures, the Permittee may petition the Commissioner for an extension of theis time period. The Permittee must adequately demonstrate the need for extension with detailed timelines and suffucuent reasoning. The Plan shall include, at a minimum, the following items:

(i) A Program Management Plan (PMP) that shall address;

(1) The overall management strategy for performing design, construction, operation, maintenance, and monitoring of corrective measure(s);

(2) The responsibilities and authorities of all organizations and key personnel involved with implementation; and

(3) The names and titles of key personnel directing the CMI activities.

(ii) A Corrective Measure(s) Design for the corrective measure(s) approved by the Commissioner pursuant to Module Condition E.4.(a) that shall include, at a minimum, items addressed in Attachment C to this Permit Module; and

(iii) A draft assurance of financial responsibility in accordance with Module Condition E.5.(c)(i) for the corrective measure(s) implementation stipulated in the CMI Plan, or reference to previously submitted documentation demonstrating current financial assurity for the selected CMI activities.

(b) Following submission of the CMI Plan set forth in Module Condition E.4.(a), subsequent activities for the Plan shall proceed in accordance with the following schedule:

(i) Meeting between the Permittee, the Agency and the Department to discuss Plan comments, as appropriate, within twenty (20) days of the Permittee's receipt of Plan comments from the Commissioner; and

(ii) Submission of a revised Plan to the Commissioner within fifteen (15) days of the above-described meeting. (If the above referenced meeting is determined not to be necessary, the Permittee shall submit a revised Plan to the Commissioner according to a schedule specified by the Department not to exceed thirty-five (35) days after Permittee's receipt of Plan comments from the Commissioner).

(c) Financial assurance for corrective measure(s) implementation shall be addressed by the Permittee as follows:

(i) Provide to the Commissioner documentation of assurances of Permittee's financial responsibility, as required by Article 27, Title 9, 6NYCRR 373-2.6(1), for completing the corrective measure(s) specified in the final CMI Plan. Such documentation shall utilize a mechanism specified in 6NYCRR 373-2.8(j) in a manner which reflects the amount of the cost estimate provided in the final CMI Plan approved by the Commissioner for the specified corrective measure(s); and

(ii) If the corrective measure(s) specified in the final CMI Plan approved by the Commissioner is/are significantly changed as a result of the permit modification process, the Permittee shall submit appropriate amendments to the assurance of financial responsibility required by Module Condition E.4.(c)(i) within forty (40) days following the effective date of the modification.

5. PERMIT MODIFICATION FOR REMEDY.

(a) Based on information the Permittee submits in the RFI Final and Summary Reports, the CMS Final Report, the Final CMI Plan and other information, the Commissioner will initiate a permit modification to this Permit, pursuant to 6NYCRR 373-1.7(b) and

a. Sample calculations (one example presented and explained clearly for significant or unique design calculations);

b. Presentation of equations essential to understanding the report; and

c. Results of laboratory or field tests.

B. Operation and Maintenance Plan

The Permittee shall prepare an Operation and Maintenance Plan to cover both implementation and long term maintenance of the corrective measure. The plan shall be composed of the following elements.

1. Description of normal operation and maintenance (O&M);

   a. Description of tasks for operation;
   b. Description of tasks for maintenance;
   c. Description of prescribed treatment or operation conditions; and
   d. Schedule showing frequency of each O&M task.

2. Description of potential operating problems;

   a. Description and analysis of potential operation problems;
   b. Sources of information regarding problems; and
   c. Common and/or anticipated remedies.

3. Description of routine monitoring and laboratory testing;

   a. Description of monitoring tasks;
   b. Description of required laboratory tests and their interpretation;
   c. Required QA/QC; and
   d. Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.

4. Description of alternative O&M;

   a. Should systems fail, alternate procedures to prevent undue hazard; and

   b. Analysis of vulnerability and additional resource requirements should a failure occur.

5. Safety Plan;

   a. Description of precautions, of necessary equipment, etc., for site personnel; and

   b. Safety tasks required in event of systems failure;

   c. Maintenance of safety equipment;

ATTACHMENT I

d. Description of environmental monitoring necessary to ensure protection of off-site individuals in the vicinity of the facility;

e. Description of site access controls.

6. Description of equipment; and

a. Equipment identification;

b. Installation of monitoring components;

c. Maintenance of site equipment; and

d. Replacement schedule for equipment and installed components.

7. Records and reporting mechanisms required.

a. Daily operating logs;

b. Laboratory records;

c. Records for operating costs;

d. Mechanism for reporting emergencies;

e. Personnel and maintenance records; and

f. Monthly/annual reports to State agencies.

An initial Draft Operation and Maintenance Plan shall be submitted simultaneously with the Prefinal Design Document submission and the Final Operation and Maintenance Plan with the Final Design Documents.

C. Cost Estimate

The Permittee shall develop cost estimates for the purpose of assuring that the facility has the financial resources necessary to construct and implement the corrective measure(s). The cost estimate developed in the Corrective Measure Study shall be refined to reflect the more detailed/accurate design plans and specifications being developed. The cost estimate shall include both capital and operation and maintenance costs. An Initial Cost Estimate shall be submitted simultaneously with the Prefinal Design submission and the Final Cost Estimate with the Final Design Document.

D. Project Schedule

The Permittee shall develop a Project Schedule for construction and implementation of the corrective measure or measures which identifies timing for initiation and completion of all critical path tasks. Permittee shall specifically identify dates for completion of the

project and major interim milestones. An Initial Project Schedule shall be submitted simultaneously with the Prefinal Design Document submission and the Final Project Schedule with the Final Design Document.

E. Construction Quality Assurance Objectives

The Permittee shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and documentation.

F. Health and Safety Plan

The Permittee shall modify the Health Safety Plan developed for the RCRA Facility Investigation to address the activities to be performed at the facility to implement the corrective measure(s).

G. Design Phases

The design of the corrective measure(s) should include the phases outlined below.

1. Preliminary design

The Permittee shall submit the Preliminary design when the design effort is appropriately 30% complete. At this stage the Permittee shall have field verified the existing conditions of the facility. The preliminary design shall reflect a level of effort such the the technical requirements of the project have been addressed and outlined so that they may be reviewed to determine if the final design will provide an operable and usable corrective measure(s). Supporting data and documentation shall be provided with the design documents defining the functional aspects of the program. The preliminary construction drawings by the Permittee shall reflect organization and clarity. The scope of the technical specifications shall be outlined in a manner reflecting the final specifications. The Permittee shall include with the preliminary submission design calculations reflecting the same percentage of completion as the designs they support.

2. Intermediate design

Complex project design may necessitate review of the design documents between the preliminary and the prefinal/final design. At the discretion of the Department, a design review may be required at 60% completion of the project. The intermediate design submittal should include the same elements as the prefinal design.

3. Correlating plans and specifications

General correlation between drawings and technical specifications,

is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifications, the Permittee shall:

a. Coordinate and cross-check the specifications and drawings; and

b. Complete the proofing of the edited specifications and required cross-checking of all drawings and specifications.

These activities shall be completed prior to the 95% prefinal submittal to the Agency.

4. Equipment start-up and operator training

The Permittee shall prepare, and include in the technical specifications governing treatment systems, contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjustment, start up and operation of the treatment systems, and training covering appropriate operational procedures once the start up has been successfully accomplished.

5. Additional studies

Corrective Measure Implementation may require additional studies to supplement the available technical data. Before directing the Permittee to conduct any additional studies, the Department shall confer with the Permittee to review and discuss any proposed additional studies. At the direction of the Department for any such studies required, the Permittee shall furnish all services, including field work as required, materials, supplies, plant, labor, equipment, investigations, studies and superintendence. Sufficient sampling, testing and analysis shall be performed to optimize the required treatment and/or disposal operations and systems. There shall be an initial meeting of all principal personnel involved in the development of the program. The purpose will be to discuss objectives, resource, communication channels, role of personnel involved and orientation of the site, etc. The interim report shall present the results of the testing with the recommended treatment or disposal system (including options). A review conference shall be scheduled after the interim report has been reviewed by all interested parties. The final report of the testing shall include all data taken during the testing and a summary of the results of the studies.

6. Prefinal and final design

The Permittee shall submit the prefinal/Final design documents in two parts. The first submission shall be at 95% completion of design (i.e., prefinal). After approval of the prefinal submission, the Permittee shall execute the required revisions and submit the final documents 100% complete with reproducible drawings and specifications.

The prefinal design submitted and shall consist of the Design Plans and Specifications, Operation and Maintenance Plan, Capital and Operating and Maintenance Cost Estimate, Project Schedule, Quality Assurance Plan and Health and Safety Plan.

The final design submittal consist of the Final Design Plans and Specifications (100% complete), the Permittee Final Construction Cost Estimate, the Final Operation and Maintenance Plan, Final Quality Assurance Plan, Final Project Schedule and Final Health and Safety Plan. The completeness of the design documents should be such that the Permittee would be able to include them in a bid package and invite contractors to submit bids for the construction project.

ATTACHMENT II

* Statement of Corrective Measures objectives.

* Program Management Plan which includes:

  - Management strategy.

  - The responsibilities and authorities of all organizations and key personnel involved with implementation.

  - Names and titles of key personnel.

* A corrective Measures Design which addresses all items presented in Attachment C of Permit Module III.

* Operation and Maintenance Plan.

* Construction and Quality Assurance Objectives.

* Health and Safety Plan.

* Records and reporting.

OPERATION AND MAINTENANCE PLAN

OB-97 REC 1

OB-97 OPERATION AND MAINTENANCE PLAN

The OB-97 groundwater recovery system (corrective measure to SWMU #96) is designed to be operated on a seasonal basis due to its remove location and inaccessibility of electrical power with which to weather-proof the system. This Operation and Maintenance Plan (O&M Plan) includes routine activities and seasonal maintenance to be performed on the system and its components by Xerox environmental representatives and maintenance personnel. The component manufacturers' installation instructions and specifications are attached to this plan as Appendix A. A piping and instrumentation diagram is attached as Figure 1.

ROUTINE OPERATION

The routine operation of the OB-97 groundwater recovery system shall consist of the following activities:

1. Once per week the flow meter will be read and recorded by Xerox maintenance staff. This information will be provided to Xerox environmental staff.

2. Once per week a physical inspection shall be completed on the system by Xerox maintenance staff, checking for visible indications of leaks or flow blockage. The differential pressure around the in-line filters will be read and recorded. Results of the physical inspection shall be provided to Xerox environmental staff.

3. Influent and effluent samples as required by the SPDES Permit for this discharge will be obtained at the required frequency and analyzed according to the permit requirements by the contract analytical laboratory, Columbia Analytical Services. Reports of the sampling and analysis will be made on the Discharge Monitoring Reports submitted monthly to the NYSDEC by Xerox environmental.

ROUTINE MAINTENANCE

Routine maintenance activities shall consist of the following:

1. Xerox maintenance shall maintain the area of equipment set-up clear of vegetation growth that may obstruct the operation or access to the equipment.

2. If the differential pressure around the in-line cartridge filters is greater than 5 psi the filter cartridges will be replaced. Waste filter cartridges will be contained in a plastic bag and transported to Building 348 for disposal with other like materials in an environmentally acceptable manner.

3. If the sample analytical results indicate a breakthrough of volatile organic compounds in the effluent the carbon drums will be removed and replaced with new carbon per the manufacturer's recommended procedure.

4. Xerox maintenance will repair or replace any component that is found to be leaking or operating incorrectly during the weekly physical inspections.

SEASONAL OPERATION AND MAINTENANCE

Seasonal O & M activities shall consist of the following:

1. During the late fall of each year the recovery equipment will be disassembled for winterization activities. The solar collector panel and associated wiring and controls will be disassembled and stored in Building 348. The carbon drums will be shipped form Xerox according to approved waste handling methods. Filter cartridges will be removed and all piping will be drained. The recovery pump will be pulled up from the well.

2. Prior to seasonal storage in Building 348, the recovery pump will be cleaned and received the manufacturer's recommended maintenance.

3. In the spring of each year, when there is no further freeze threat, the recovery system will be reassembled at the well head. Prior to installing the pump the well will be baled to dryness to remove any accumulated sediment or iron bacteria. This material will be containerized and processed in the water treatment systems in Building 348. The system including the pump, solar panel and associated wiring and controls will be reassembled in accordance with manufacturer's recommendations. New carbon drums will be installed to treat the recovered groundwater in accordance with the manufacture's recommendations. The system operation will be monitored daily during the first week following seasonal restart to check for leaks or equipment malfunction. Necessary maintenance will be conducted by Xerox maintenance staff.

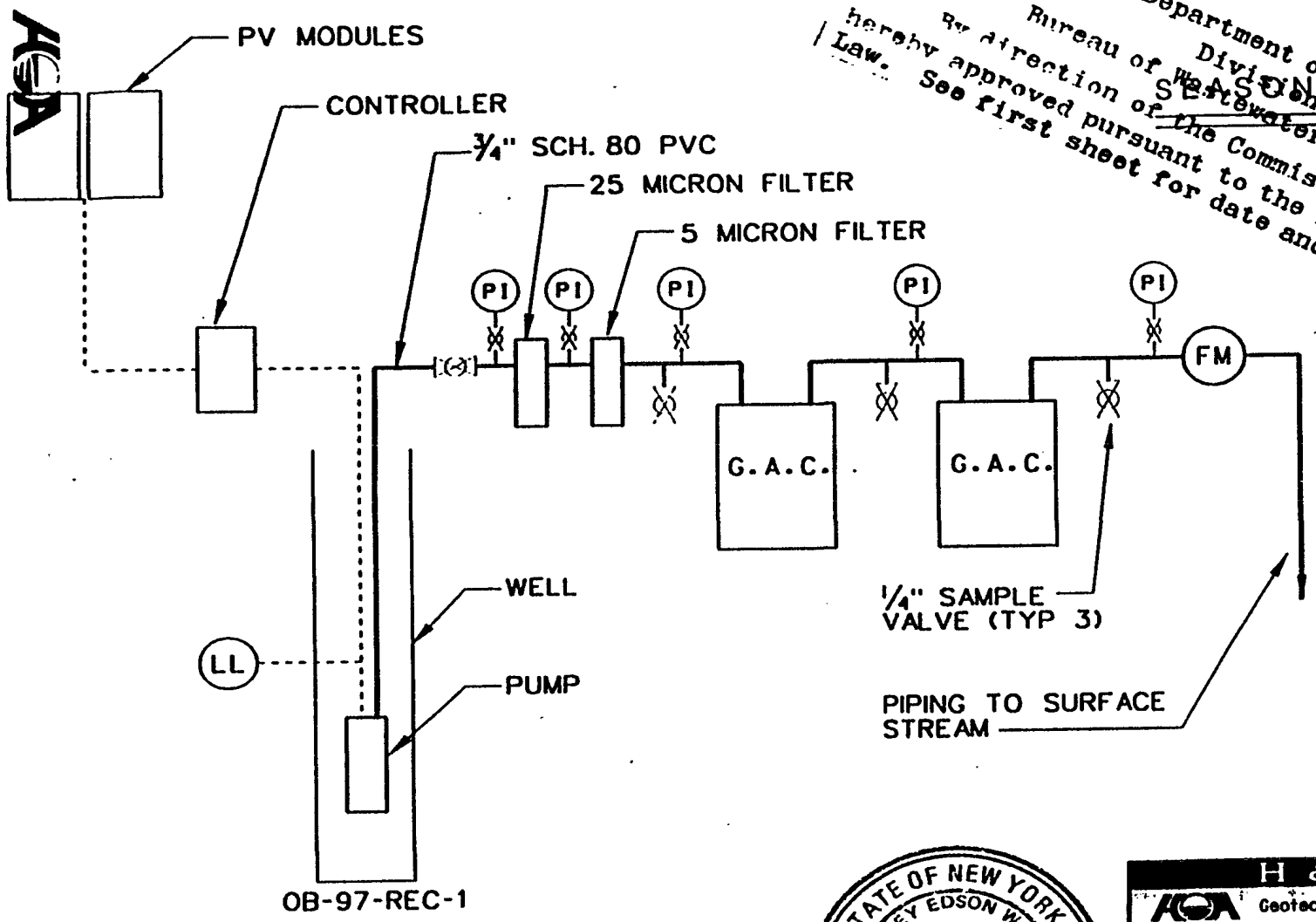
FILE No. 07580-072

FIGURE 1

New York State Department of Environmental Conservation
Division of Water
Bureau of Wastewater Facilities Design

By direction of the Commissioner these plans are hereby approved pursuant to the Environmental Conservation Law. See first sheet for date and signature.

SEASONAL USE ONLY



LEGEND

PV - PHOTO VOLTAIC

LL - LOW LEVEL

⋈ - BALL VALVE

G.A.C. - 200• GRANULAR ACTIVATED CARBON

(FM) - TOTALIZING FLOW METER

(PI) - PRESSURE INDICATOR

STATE OF NEW YORK • STANLEY EDSON WALKER • LICENSED PROFESSIONAL ENGINEER No. 050181

MAY 08 1995

H & A OF NEW YORK

Geotechnical Engineers & Environmental Consultants

XEROX CORPORATION
OB-97 INVESTIGATIVE AREA (SWMU-96)
WEBSTER, NEW YORK

OB-97 INVESTIGATIVE AREA TREATMENT SYSTEM P & ID

SCALE: NONE

MAY 1995

FILENAME: 07580-072:WP1004A.DGN

FIGURE 3

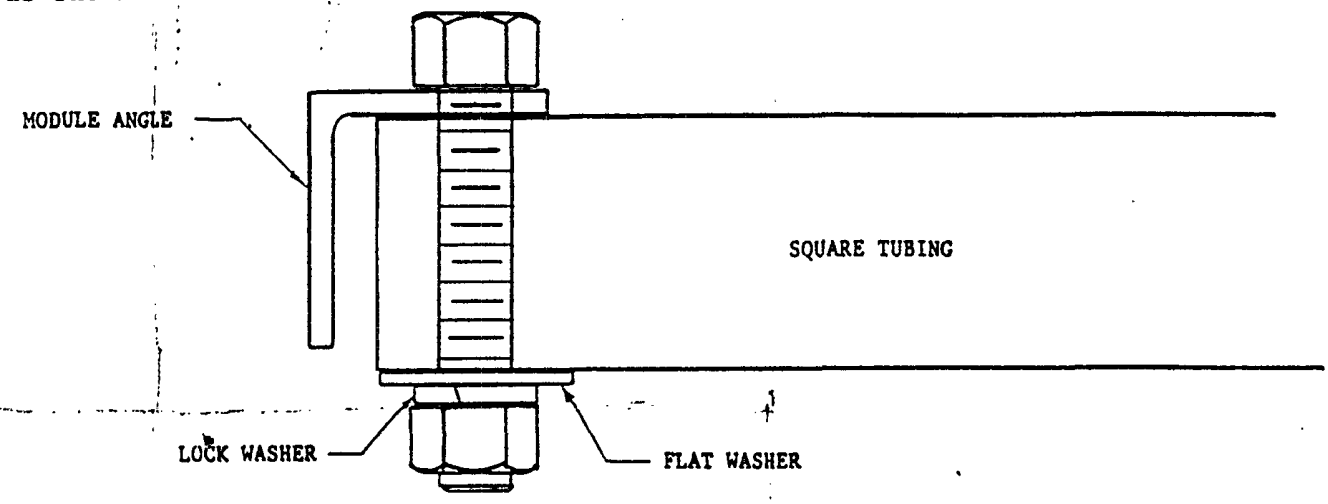
APPENDIX A

zomeworks corporation
PO BOX 25805, ALBUQUERQUE, NEW MEXICO 87125 505-242-5354

INSTALLATION INSTRUCTIONS FOR FRPT02/ TOP OF POLE FIXED RACK

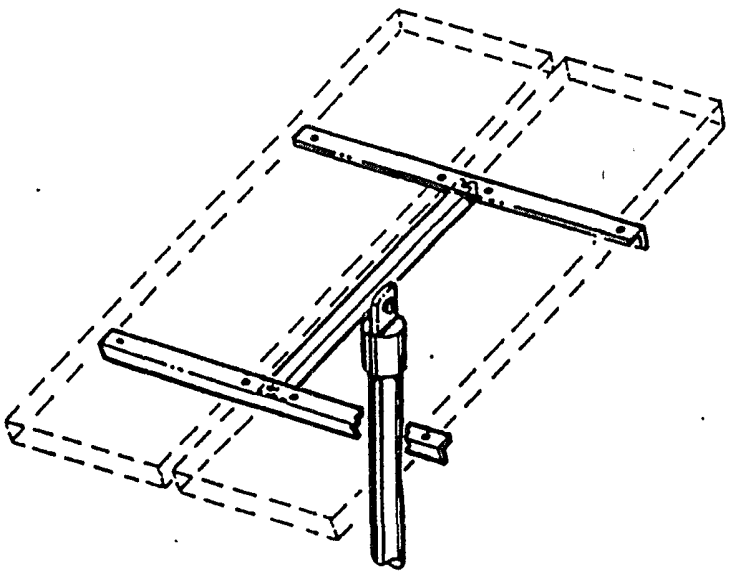
1. Cement a 2"SCH 40 steel pole in a hole approximately 12" in diameter and 30" deep. There should be no more than 60" of pipe sticking out of the ground.

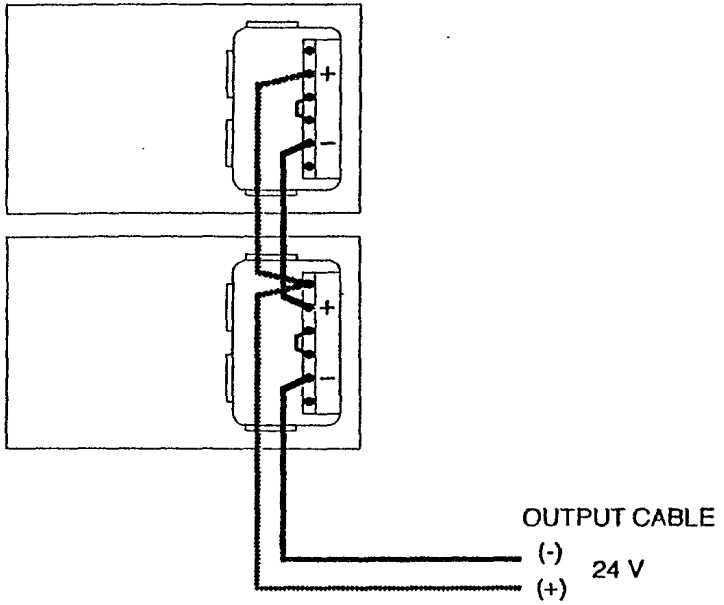
2. Assembly the rack by bolting the module angles to the square tubing as shown.

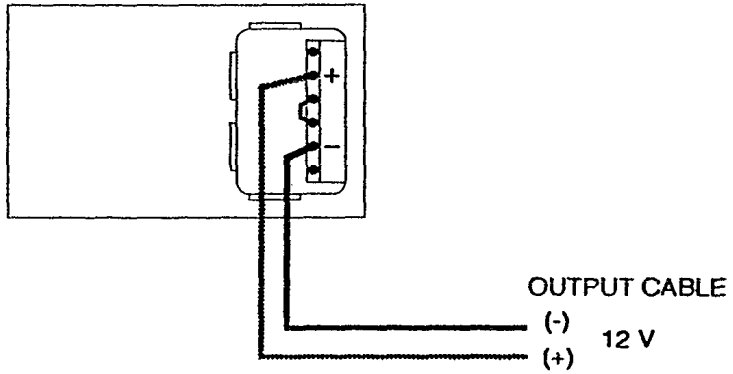


3. Place the rack sleeve over the mounting pole, point the rack south and lock in place by tightening the set bolt.

4. Mount your modules using the 1/4" stainless steel hardware provided. Use the flat washer agianst the hole in the rack because this hole is oversized.



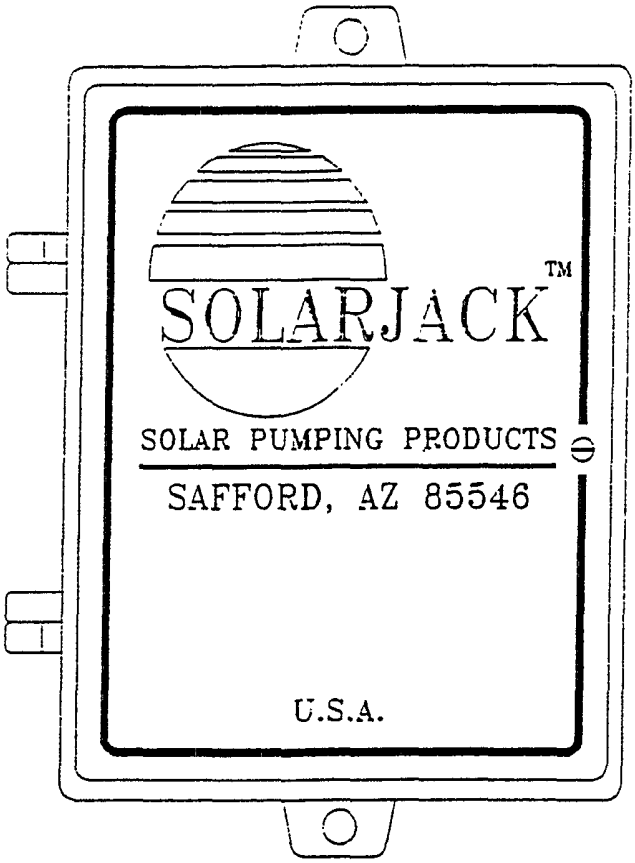




Applied Power Corporation
1210 Homann Dr SE, Lacey, WA 98503
Ph (206) 438-2110 Fax (206) 438-2115

PWS Array Wiring
Diagram, PWS-1 & PWS-2

Dwg: 9405033-PWS	Date: 5/19/94	By: KAK



PC10-28H

FOR CONTROLLERS WITH SERIAL NUMBERS 11600 THRU 11700

The SOLARJACK PC10-28H PUMP CONTROLLER is a high quality, solid state, DC power converter designed as an interface between an SDS series pump and the DC power source. This power source may be solar panels, wind generator, batteries, or any combination of the three. The purpose of this controller is to maximize the total daily water output while providing protection for the pump as well as the power source.

The unique features incorporated in this controller will protect your pump system allowing it to provide you with many years of dependable, trouble free service. When used in a solar panel direct system it provides protection for the pump from over-voltage and over-current conditions or will provide current boosting in low sunlight conditions. When used in a 24 volt battery system it provides a low voltage disconnect for the ultimate in battery protection. It will also protect your charge controller from inductive voltage spikes that are generated when the pump motor switches on or off. When used with a wind generator it will protect the system from over-voltage and over-current conditions as well as providing current boosting to the pump in low wind situations.

This manual will show you how to make the connections for your particular system configuration. Additional options are also explained and the wiring diagrams are given.

PC10-28H SPECIFICATIONS

Input Voltage	12-45V (Open Circuit) (Two Panels in Series Max)
Maximum Output Current	10 AMPS
Maximum Surge Current	15 AMPS
Maximum Output Power	300 Watts (30V @ 10A)

FEATURES

1.) Current Boosting for matching the load requirements of the pump.

2.) Voltage Regulation of the PV array at its maximum power point.

3.) Low Battery Cut-off for 24V battery systems.

4.) Built in controller protection:
A. Over-temperature cut-off
B. Reverse polarity (10 Amp Max)
C. Surge suppression
D. Output current limiting

5.) Weatherproof cast aluminum enclosure with hinged door.

6.) On/off switch.

7.) Voltage limiting for pump system protection.

8.) Remote float switch circuit.

9.) Low water cut-off circuit with adjustable set points.

10.) High water cut-off circuit with adjustable set points.

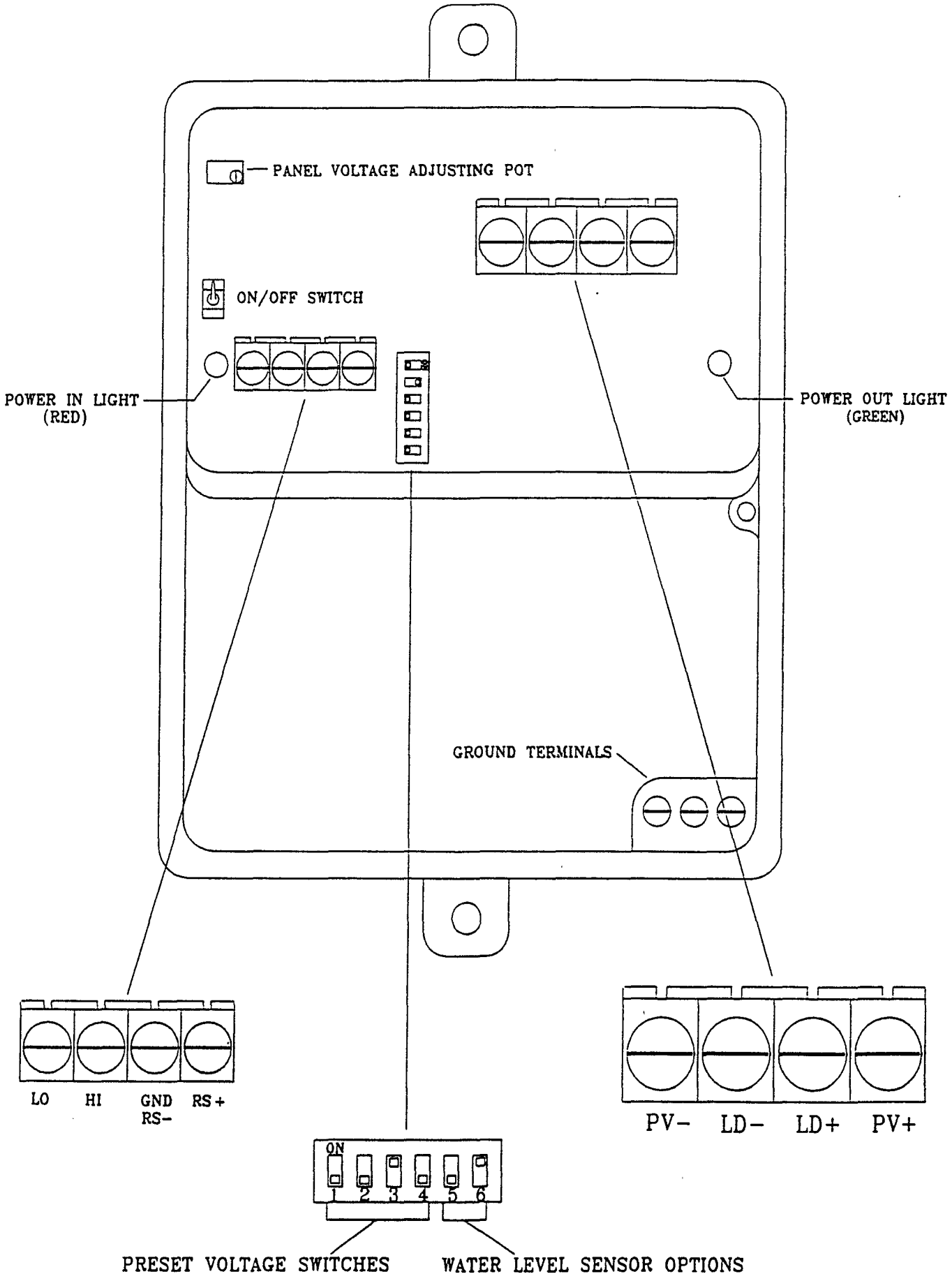
11.) Power in and power out indicators.

12.) Strain relief connectors.

13.) Pre-adjusted panel voltage settings from a DIP switch.

14.) Voltage adjusting pot for precision voltage adjustments.

15.) Reversible low water cut-off to high water cut-off switch.


PANEL VOLTAGE ADJUSTING POT
ON/OFF SWITCH
POWER IN LIGHT
(RED)
POWER OUT LIGHT
(GREEN)
GROUND TERMINALS
LO
HI
GND
RS-
RS+
PV-
LD-
LD+
PV+
ON
1
2
3
4
5
6
PRESET VOLTAGE SWITCHES
WATER LEVEL SENSOR OPTIONS

WIRING THE PC10-28H CONTROLLER

CAUTION: Reverse polarity on a battery system or a panel system capable of producing over 10 amps will damage the controller.

WIRE TERMINAL DESCRIPTIONS

WITH DIP SWITCH #6 ON: High water cut-off (Tank fill-up)

1	LO	LOW WATER LEVEL SENSOR turns the pump on. (Mount an E-1s electrode 2" above the ground sensor.)
2	HI	HIGH WATER LEVEL SENSOR turns the pump off. (Mount an E-1s brass electrode at the desired turn-off point.)

WITH DIP SWITCH #5 ON: Low water cut-off

1	LO	LOW WATER LEVEL SENSOR turns the pump off. (Mount an E-1s electrode 2" above the ground sensor.)
2	HI	HIGH WATER LEVEL SENSOR turns the pump on. (Mount an E-1s brass electrode below the static water level at the desired turn-on point.)

3	GN RS-	GROUND OR COMMON WATER SENSOR must be in the water at all times. (Mount an E-1s electrode 2" above the pump.)
3 & 4		REMOTE ON-OFF CIRCUIT is used to turn the pump on and off from a remote location. (Connect the two terminals to turn the pump off.)
5	PV-	NEGATIVE WIRE from the PV array.
6	LD-	NEGATIVE WIRE to the pump or load.
7	LD+	POSITIVE WIRE to the pump or load.
8	PV+	POSITIVE WIRE from the PV array.

* **NOTE** If the low water cut-off circuit is not being used, switch #5 must be in the off position and switch #6 must be in the on position for the controller to work properly.

The PC10-28H controller is limited to a maximum of 2-17 volt panels connected in series. However 4 panels may be used as 2 parallel sets of 2 in series or 6 panels may be used as 3 parallel sets of 2 in series. Power to the load is limited to 300 watts so the use of more power will not increase the pump flow rate.

CONTROLLER ADJUSTING PROCEDURE

The PC10-28H controller has an easy to adjust pre-set voltage selector switch. This six position selector DIP switch is located on the face of the controller and has three preset voltage settings for various panel and battery arrangements. Please refer to the chart below for the switch position for your system.

Only one of the first 4 switches should be in the on position at one time. These preset voltage settings will work with most standard solar modules on the market. If you need to change these voltage set points the "panel voltage adjusting pot" will allow you to do so. (Refer to the controller adjusting procedures below). **CAUTION: Improper adjustment of this pot will decrease the flow rate of the pump or will not allow the controller to turn on.**

For use on panel direct systems the controller is designed to hold the voltage constant around the maximum power point of the panels. For battery systems it will turn the pump off if the battery voltage drops below the set point. This will protect your battery from low voltage conditions and thus increase its life.

Switch No.	Used For	Voltage Set Point
1	12 Volt Panel	13.0
2	24 Volt Battery	23.3
3	24 Volt Panel	26.0
4	Factory Use Only	36.7
5	Low Water Cut-Off	
6	High Water Cut-Off	

The purpose of this procedure is to adjust the voltage of the PV array to its peak power point and thus obtain the maximum water delivery from the pump. This procedure should be performed with the panels at their normal operating temperature at mid-day and the appropriate DIP switch in the up position.

1. With the system installed and pumping water, turn the panels away from the sun until the pump flow rate is reduced by approximately 50%. If this is not possible then shade the panels slightly until you obtain the same results.

2. Connect a DC volt meter to the pump side of the controller. (LD+ and LD-)

3. Turn the small brass adjusting screw on the "Panel Voltage Adjusting Pot", located on the front of the controller, until the highest possible voltage is obtained.

4. Return the panels to their normal position. The pump will then operate at its maximum output.

TROUBLESHOOTING

PUMP DOES NOT RUN

1. Check wiring diagrams for proper connections. CAUTION: **If a battery system is used and the polarity is reversed, damage to the controller will result. This is not covered under warranty.**

2. Check for proper panel, controller, and/or battery voltage with a volt meter. A quick look at the indicator lights will verify power coming from the panels going to the controller (red) and power from the controller going to the pump (green). If the red light is on and the green light is not make sure the switch is on, disconnect the remote switch wires, if used, and turn switch #5 off and #6 on. If the green light is still not on disconnect the pump wires, LD- and LD+. If the green light does not turn on then check voltage on LD- and LD+ with a volt meter to confirm no output voltage.

For an additional pump test, connect a jumper wire across terminals 5 PV- and 6 LD-, this will bypass the controller and will allow the pump to run panel direct. **Note: You must have full or almost full sun for this test to be valid.**

3. Make sure the proper voltage selector switch is turned on for your panel or battery arrangement. **Note: If the incoming voltage is lower than the set point voltage, the controller will not turn on.**

4. On a battery system make sure the batteries are at a full state of charge or that the voltage is at least above the set point, 23.3 volts, otherwise the controller will not turn on.

IF BOTH LIGHTS ARE ON AND THE PUMP DOES NOT RUN

Note: To verify power coming out of the controller, connect a DC volt meter across terminals 6 LD- and 7 LD+. If 12 volts or more is coming out then:

1. Check the splice above the pump for proper connections.

2. Check for a broken wire leading to the pump.

3. Check for an open motor winding. (With an ohmmeter set on the R x 1 scale check between the two pump wires. Meter reading should be between .5 and 50 ohms. If the resistance is higher than this, disconnect the pump at the splice above the pump and check again.)

IF NO VOLTAGE IS SEEN AT TERMINALS 6 LD- AND 7 LD+ THEN:

1. Make sure the switch is turned on. (In the up position)

2. Check to see if the water level is above the top electrode when the low water cut-off circuit is being used, or below the bottom electrode when the high water cut-off circuit is being used. (To bypass all remote switching circuits, disconnect wires from terminals 3 and 4 and turn switch #6 on and #5 off).

3. Check the controller for proper adjustment. If the voltage setting on the controller is higher than the incoming voltage, the controller will not turn on. (See controller adjustment section.)

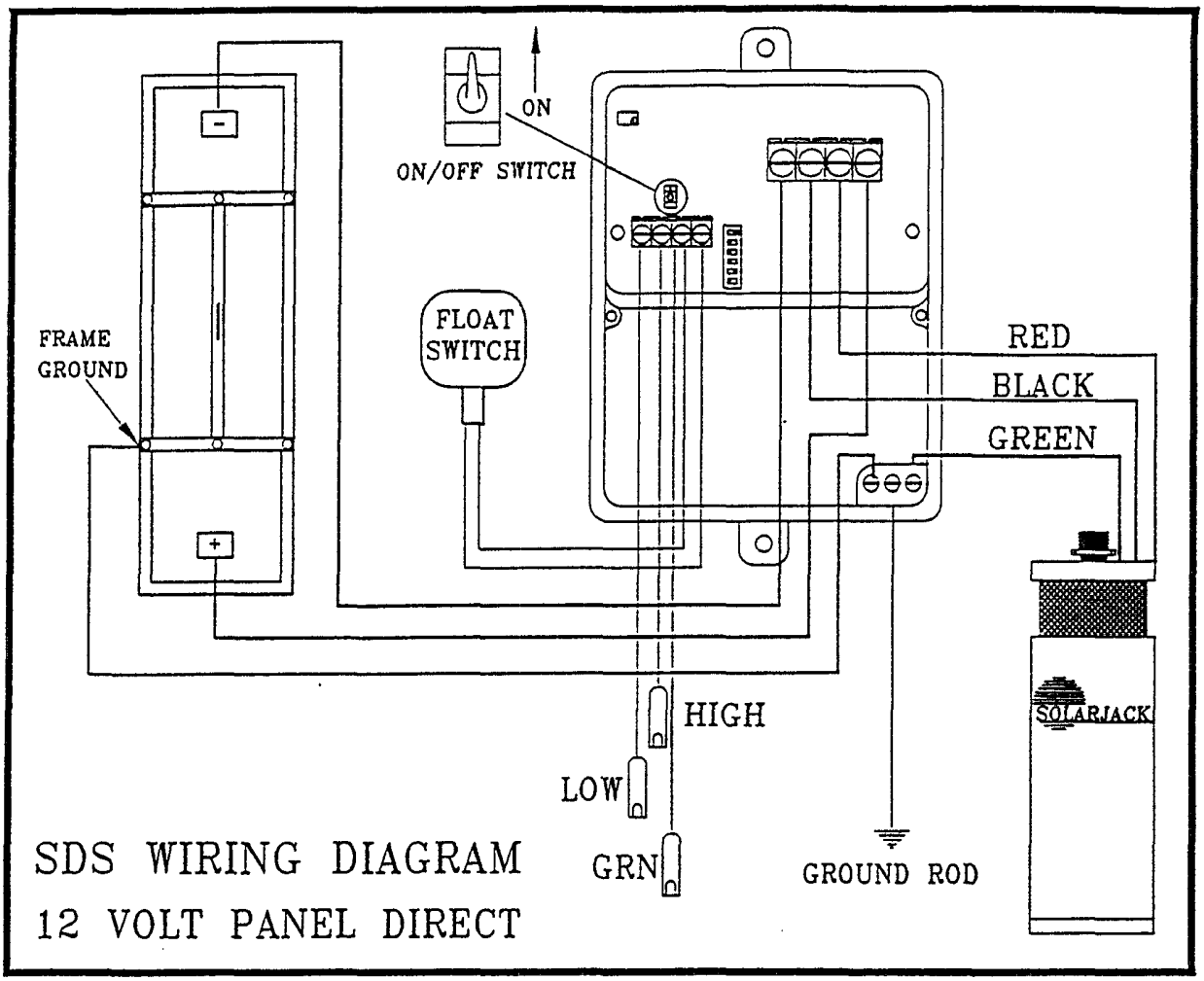
4. Check to see if the float switch, if used, is functioning properly. (Disconnect wires from terminals 3 & 4 to bypass float circuit.)

EXCESSIVE CURRENT DRAW

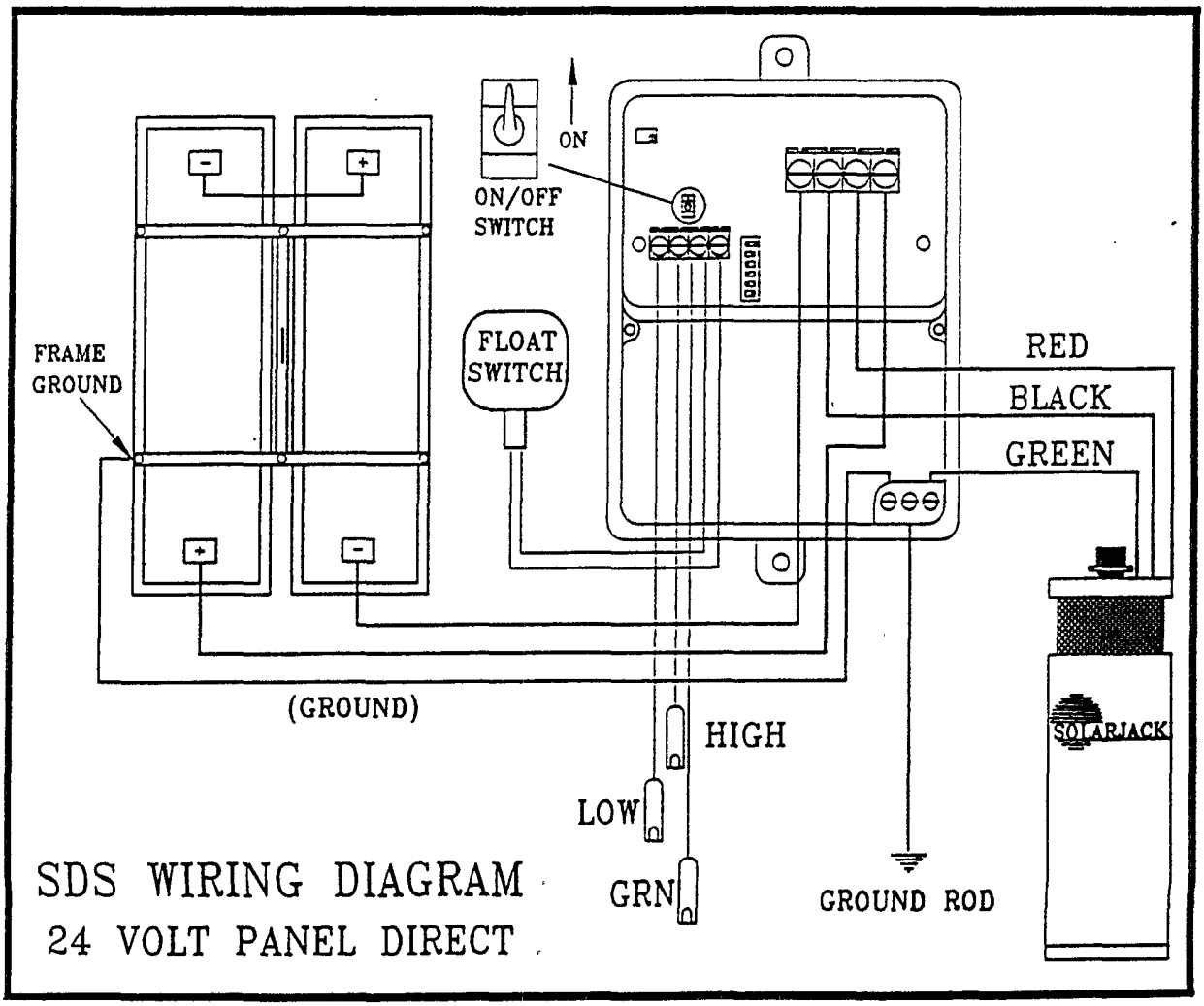
1. Check wiring diagrams for proper connections.

2. Check for skinned wires or faulty underwater splice. (See section 2.3d in your pump manual.)

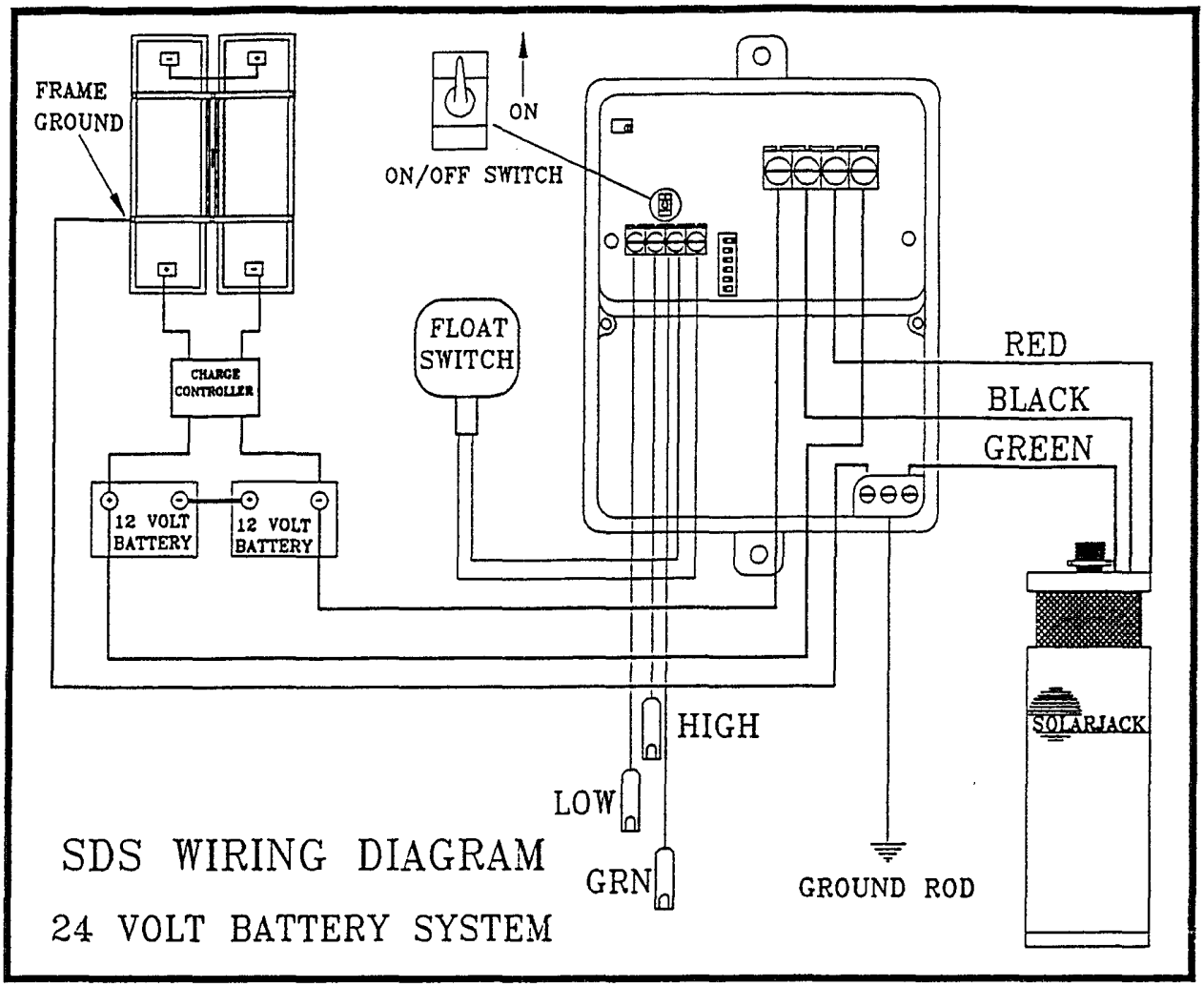
3. Check for a locked motor armature. (With the pump out of the well, bypass the controller and connect power directly to the motor leads. If the pump still does not run and the current is over 1.5 amps, the pump is in a locked rotor condition and must be repaired.)



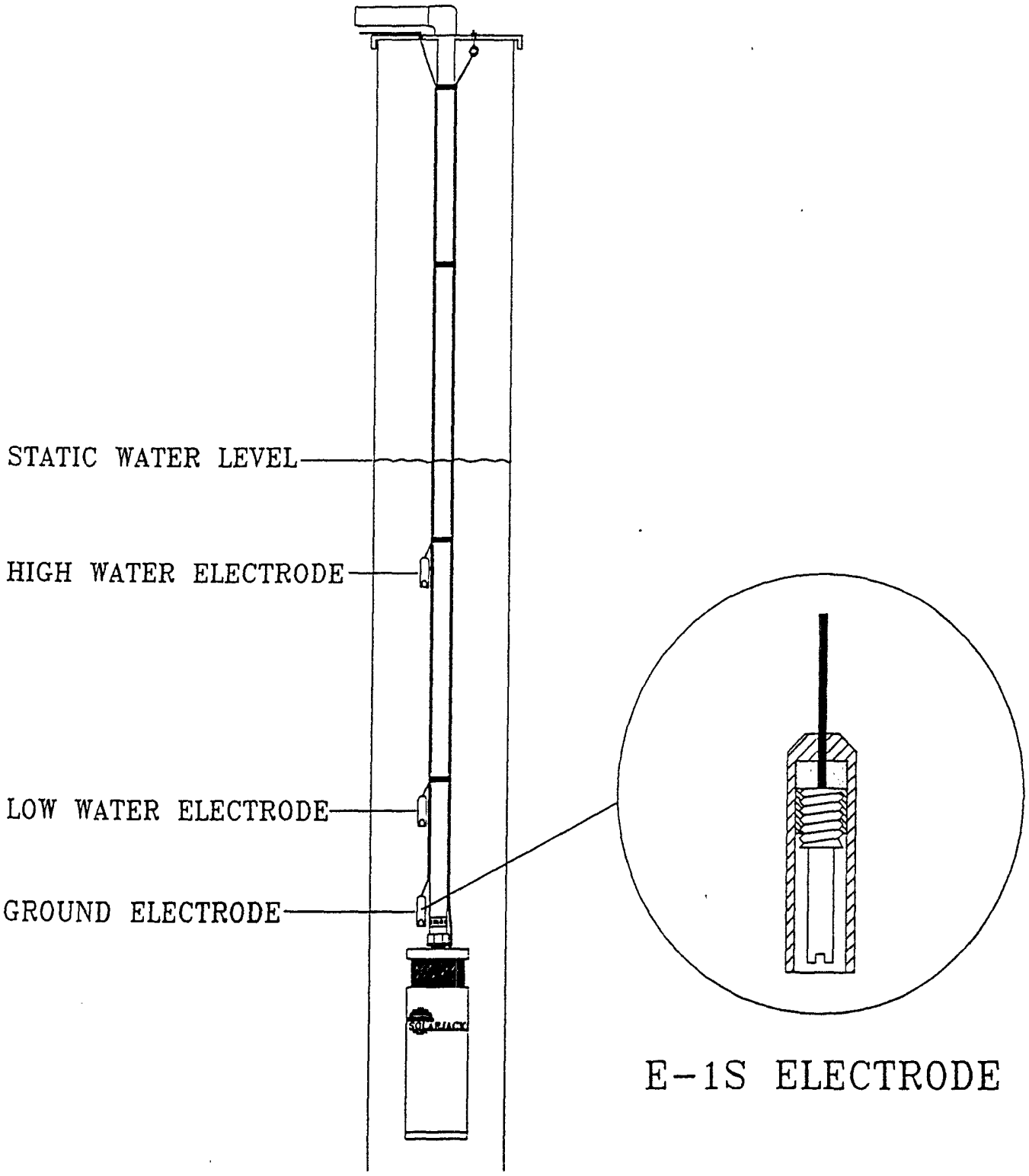
SDS WIRING DIAGRAM
12 VOLT PANEL DIRECT



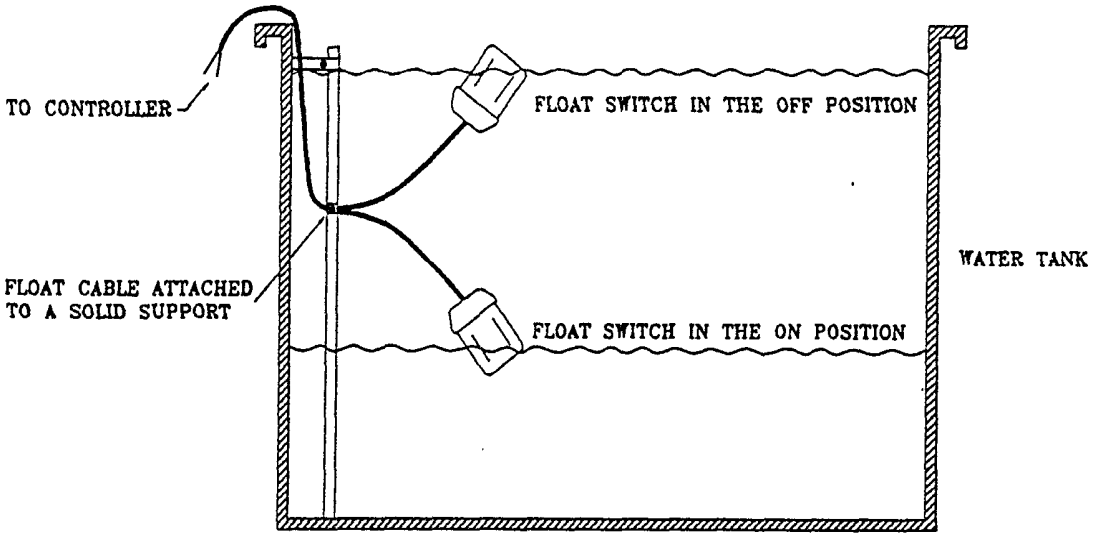
SDS WIRING DIAGRAM
24 VOLT PANEL DIRECT


FRAME
GROUND
ON
ON/OFF SWITCH
FLOAT
SWITCH
CHARGE
CONTROLLER
12 VOLT
BATTERY
12 VOLT
BATTERY
RED
BLACK
GREEN
HIGH
LOW
GRN
GROUND ROD
SOLARJACK
SDS WIRING DIAGRAM
24 VOLT BATTERY SYSTEM

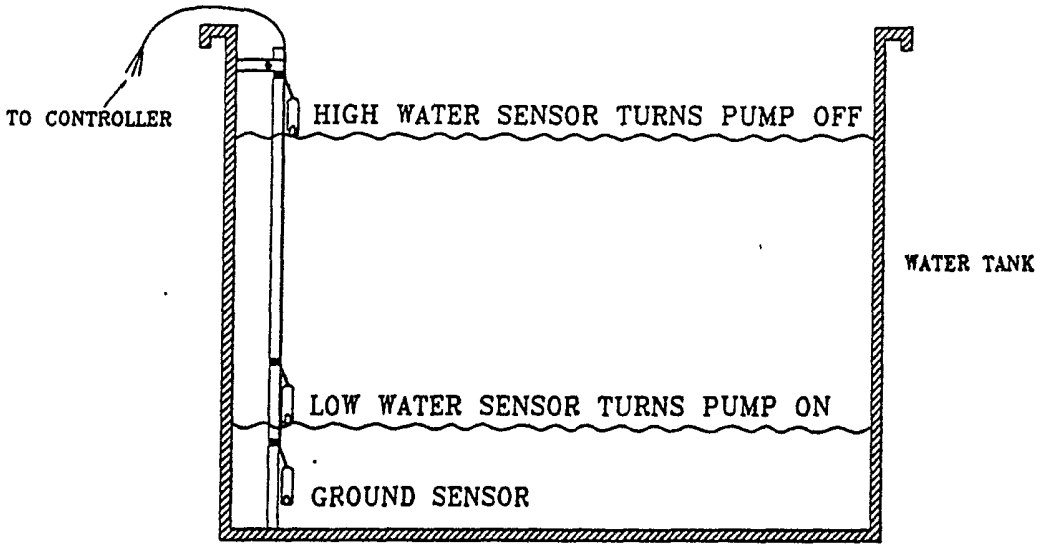
PC SERIES CONTROLLER
LOW WATER CUT-OFF CIRCUIT



WELL ELECTRODE INSTALLATION



FLOAT SWITCH INSTALLATION



TANK ELECTRODE INSTALLATION

Solarjack's Limited Warranty

LIMITED WARRANTY - Twelve Months

PC10-28H CONTROLLER

SOLARJACK warrants the product to be free from defects in materials and workmanship under normal applications and service conditions for twelve (12) months from date of sale to the original purchaser, but not to exceed 18 months from the date of manufacture. SOLARJACK will, at its option, either repair or replace the product, if it fails due to a defect in material or workmanship during the period of this warranty.

This warranty is extended only to the original purchaser. A completed warranty card must be on file at the factory before any warranty performance is rendered.

This warranty only covers failures due to defects in materials or workmanship which occur du normal use. It does not cover damage which occurs in shipment, or failures which are caused by products not supplied by SOLARJACK or failures which result from accident, misuse, abuse, neglect, mishandling, misapplication, alteration, modification, or repairs by anyone other than SOLARJACK, or damage that is attributable to act of God. ***Any disassembly whatsoever of the product voids all warranty.***

Warranty Limitations

There are no express warranties except as listed above. SOLARJACK shall have no responsibility for damage to property, persons, animals, or other loss or injury resulting from the use of this product.

UNDER NO CIRCUMSTANCES WILL SOLARJACK BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGE, UNLESS OTHERWISE EXPRESSLY STATED HEREIN. ALL PRODUCTS ARE SOLD AS IS WITH ALL FAULTS.

Any warranties are limited to the warranty period described above. SOLARJACK'S maximum liability under any warranty, expressed, or implied, or statutory, is limited to the purchase price of the product. The purchaser's exclusive remedy shall be only as stated herein. This warranty is in lieu of all other warranties expressed or implied. This warranty gives you specific rights; your state law may provide for additional rights or may affect the time and other limitations set forth herein.

This Warranty Excludes: Labor, transportation and related costs incurred by the consumer to make the allegedly defective equipment available to the factory for inspection, re-installation, costs caused by interruption of service, or lost profits.

If a problem with the product develops during the warranty period, you may contact your dealer. If the problem is not handled to your satisfaction, contact:

SOLARJACK, 325 E. Main Street, Safford, AZ 85546 (602) 428-1092 FAX (602) 428-1292

SOLARJACK™

NEW GENERATION
DC SUBMERSIBLE PUMPS

SOLARJACK'S NEW GENERATION SDS series submersible pumps are highly efficient, low voltage, DC powered, diaphragm type positive displacement pumps designed specifically for water delivery in remote locations.

They operate on 12 to 30 volts of direct current that may be supplied from a variety of independent power sources including solar panels, wind generators, batteries or any combination of the three. Power requirements can be as little as 35 watts.

Constructed of marine grade bronze and 304 stainless steel, these pumps are the highest quality submersible pumps in their class.

SDS D SERIES PUMP

DUPLEX (D-SERIES)

3.8" (96 mm) OD, 10.75" (273 mm) long, 14 lbs. (6.4 kg)

Suitable for installation in 4" (100 mm) inside diameter and larger wells.

Flow rates up to 2 GPM (7.5 LPM), and heads up to 230 feet (70.1 meters)

(See chart on back)

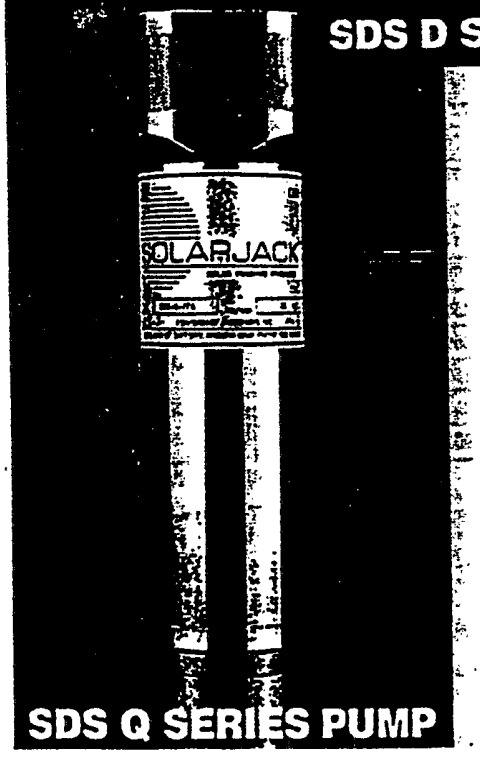
QUAD (Q-SERIES)

4.3" (109mm) OD, 12.25" (311 mm) long, 16.5 lbs. (7.5 kg)

Suitable for installation in 4.5"(114mm) inside diameter and larger wells.

Flow rates up to 3.7 GPM (14 LPM), and heads up to 100 feet (30 meters)

(See chart on back)



SDS Q SERIES PUMP

SOLARJACK'S SDS series pumps can be installed below water level in a pond, river or cistern, or installed by hand into a ground water well. They can be used to fill an open tank or in a pressurized water delivery system.

Simplicity is the key feature of the SDS series pumps. They are easy to install, require very little maintenance, and are completely serviceable.

These pumps are designed for use in stand alone water delivery systems. They are pollution-free, corrosion-free, self-lubricating and quiet. It is the ideal way to provide water for remote homes, campsites, livestock, small farms, or for many other needs beyond the commercial power grid.

QUALITY FIRST

An Independent Power System To Pump Water

SOLARJACK™
SOLAR PUMPING PRODUCTS

PWS Solar Generators

For SOLARTRONIC Water Pumping Systems

Solar Engineering

Manufacturers, Distributors and Engineers of Remote Power Systems and Products

High Quality, Solar Generator Packages for Powering Solar Water Pumping Systems.

Description

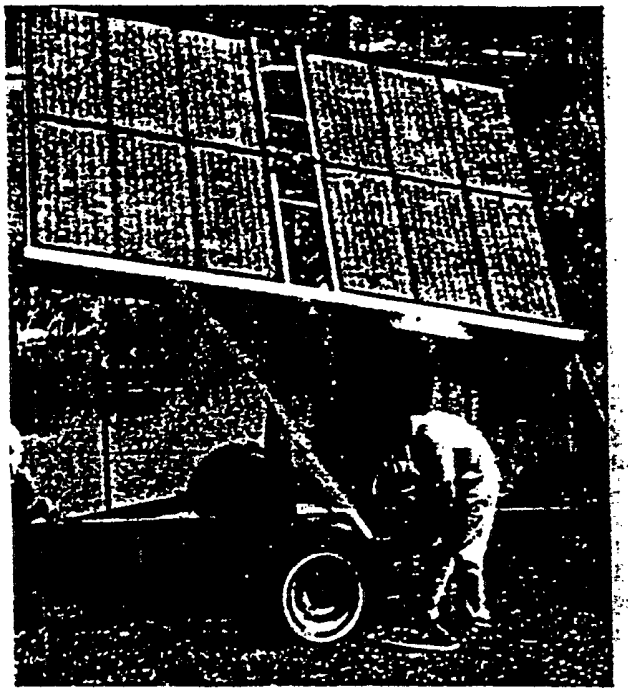
Ready for quick installation, PWS photovoltaic (solar) generators are packaged, modular, power systems engineered to meet the electrical characteristics of solar water pumping systems. PWS solar generators utilize rugged, high efficiency Solarex PV modules, with universal mount, adjustable tilt support structure, wiring harness and output cables to provide a complete generator package designed to withstand harsh climatic conditions and simplify installation. **All wiring, hardware, fasteners and instructions are included. Simple to specify, simple to install.**

Seven PWS models are available to power SOLARTRONIC submersible pump systems and two are available for smaller SDS systems. Each PWS model has power options so you can fine tune the system to meet a wide range of water requirements and site locations. Modular by design PWS generators can be easily expanded if water requirements increase.

PWS generator components are interchangeable and most models utilize power modules with identical physical dimensions to simply installation, service and repair.

Features

- Rugged high efficiency photovoltaic modules featuring crystalline silicon cells laminated with EVA, Tedlar and tempered glass supported in a bronze anodized aluminum frame. UL listed, ten year warranty.
- Large weatherproof J-box on each panel accepts standard 1/2" conduit and connectors providing simple and reliable wiring connections.
- Standard mounting structure features high strength anodized aluminum with adjustable tilt angle designed to withstand winds to 125 MPH. Universal mounting for horizontal or vertical surfaces on concrete footings, building roofs/walls or towers. PWS-2 & 4 feature steel pole mount structure. Tracking support structure available as an option on all models.
- Heavy duty UV resistant wiring harness with waterproof strain relief connectors at all connection points.
- Simple assembly and installation. Wiring diagram and assembly instructions supplied with each system.



PWS Generator Shown With Optional Sun Tracker And Trailer

Options

Sun Tracking Support : Freon actuated support structure tracks sun throughout the day to increase water production. Pole mounted for easy installation.

Portable Trailer: Rugged trailer with tracking support allows for a mobile solar pumping system for use at temporary sites or multiple locations.

Equipment Enclosures: Steel or polymer outdoor enclosures to hold batteries, controls and other equipment. Standard steel enclosure mounts to skid foundation beneath PV generator.

Battery Storage: Deep cycle, maintenance free battery bank with associated charge control for applications where nighttime or on demand pumping is desired.

Array Protection: Protective plastic faceplate and steel backplates with special fasteners may be ordered to provide added protection against breakage due to rocks, falling ice or similar projectiles.

Skid Foundation: Steel, bolt together skid supports PWS generators and provides a simple, portable base for ground mounting applications.

Solar Engineering
1210 Homann Drive SE, Lacey WA 98503
Technical Assistance Hotline 800-777-7075
Ph (206) 438-2110
Fax (206) 438-2115

Model Industrial RCDL

Nutating Disc Meter

Technical Brief

GENERAL

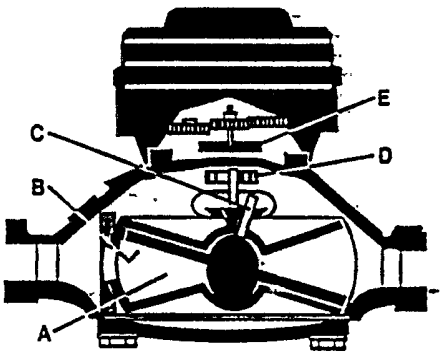
Badger's RCDL positive displacement meters are one of the most cost effective methods in metering industrial fluids. The RCDL meter's simple but efficient design assures high accuracy and repeatability over the entire meter flow range.

Made in five sizes, 1/2" through 2" for flows up to 170 GPM, these meters are extremely rugged and reliable. With only three internal moving parts, maintenance is seldom required. If necessary, it takes but a few minutes. All parts are designed and built of materials to meet your application, providing you with long life and a trouble-free, precision flow meter.

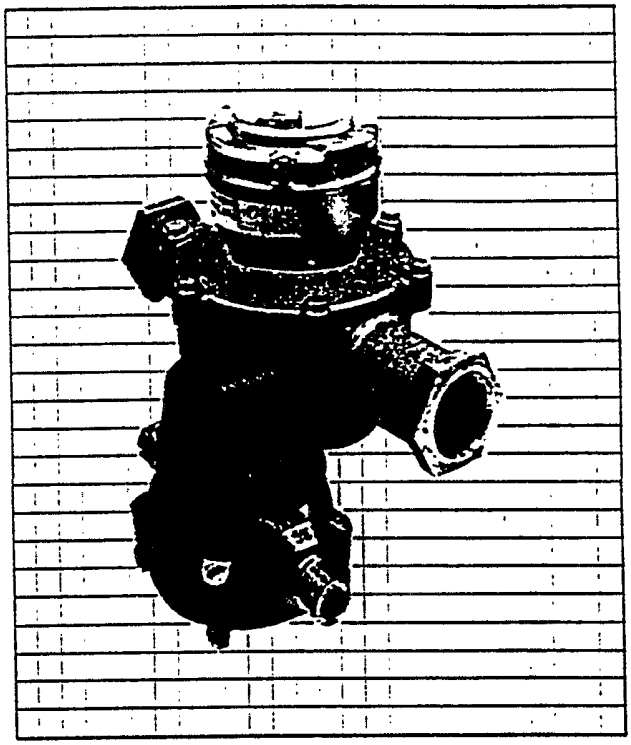
To complement the RCDL meter line, Badger offers a complete line of accessories that includes totalizers, electromechanical and electronic transmitters, rate of flow indicators and batch/process controllers.

OPERATION

The metering principle, known as positive displacement, is based on the continuous filling and discharging of the measuring chamber. Controlled clearances between the disc and the chamber insure minimum leakage for precise measurement of each volume cycle. As the disc nutates, the center spindle rotates a magnet, whose movement is sensed through the meter wall by a follower magnet or by electronic sensors. Each revolution of the magnet is equivalent to a fixed volume of fluid, which is converted to any engineering unit of measure for totalization, indication or process control.



Liquid flowing through the meter chamber (A) causes a disc (B) to nutate or wobble. This motion, in turn, results in the rotation of a spindle (C) and drive magnet (D). Rotation is transmitted through the wall of the meter to a second magnet (E) which operates the transmitter.



FEATURES

- Accuracy: ±1.5% over full range
- Repeatability: ±0.5%
- Extended 50:1 flow range
- Operating Temperature: 32° to 120° F.
- Maximum Operating Pressure: 150 PSI
- Rugged bronze housing
- Wide range of compatible accessories
- Easily maintained without removing from line
- Durable components for minimal maintenance
- Direct replacement for SC-ER

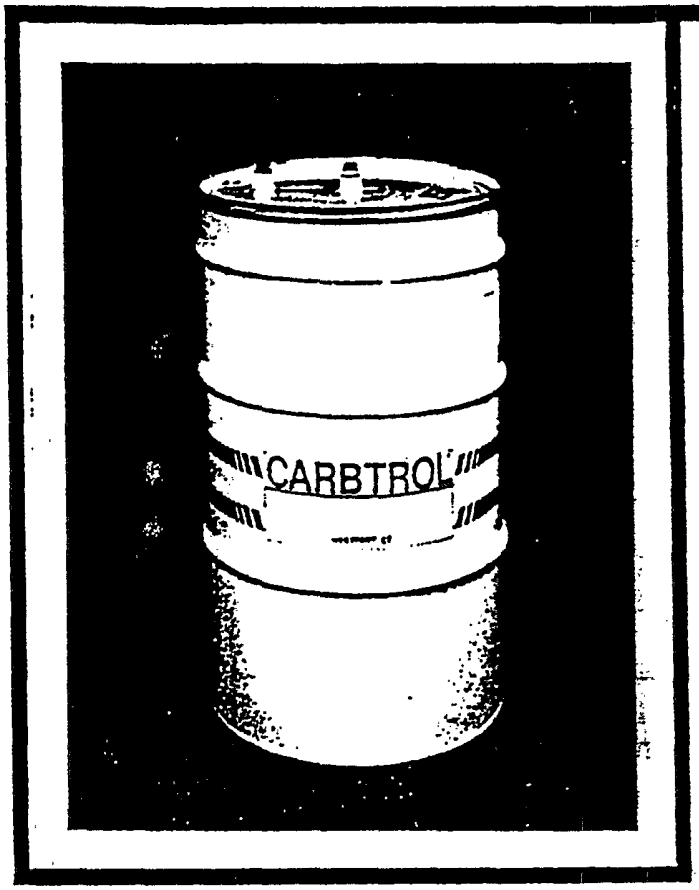
BadgerMeter,Inc.
Industrial Division

Bulletin No. ITB-072-05
December 1993

CARBTROL®

WATER PURIFICATION CANISTER 200 POUND ACTIVATED CARBON

L-1



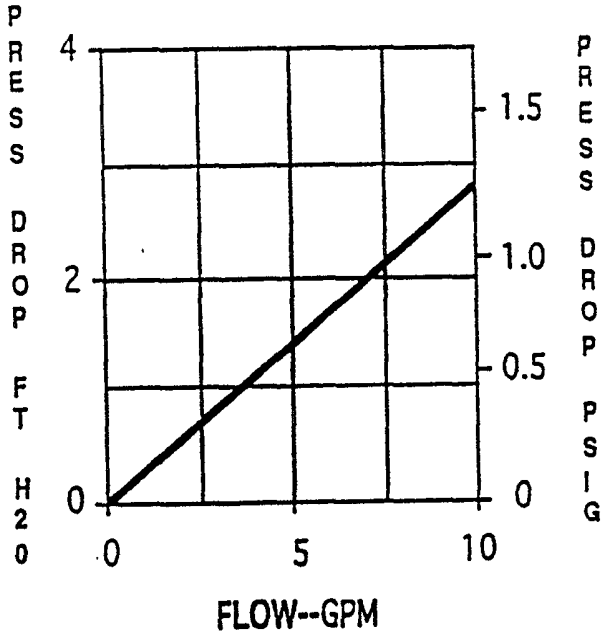
The CARBTROL L-1 (liquid) Canister handles up to 10 gpm.

FEATURES

- 200 pounds of high activity carbon.
- Large 1 1/4" internal piping. Low pressure drop allows operation of three canisters in series.
- Standard FPT couplings for easy installation - saves time and money.
- Special "no leak" lid gasket.
- Heavy duty steel drums, DOT 17C, suitable for shipment of spent hazardous carbon.
- Piping design eliminates channeling.

SPECIFICATIONS

DRUM:	24" Ø x 34" high, mild steel, epoxy phenolic internal coating, with polyethylene liner.
CARBON:	200 lbs.
SHIPPING WEIGHT:	250 lbs.
INLET:	1 1/4" FPT, steel
OUTLET:	1 1/4" FPT, steel
INTERNAL PIPING:	1 1/4" PVC
DRAIN:	3/4" bung
PRESSURE DROP:	1.25 psi @ 10 gpm
MAX. OPERATING PRESSURE:	10 psi



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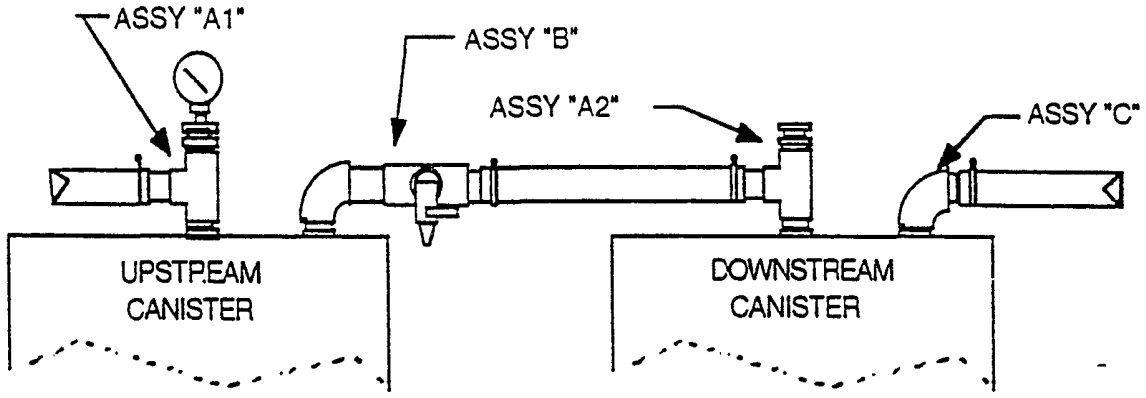
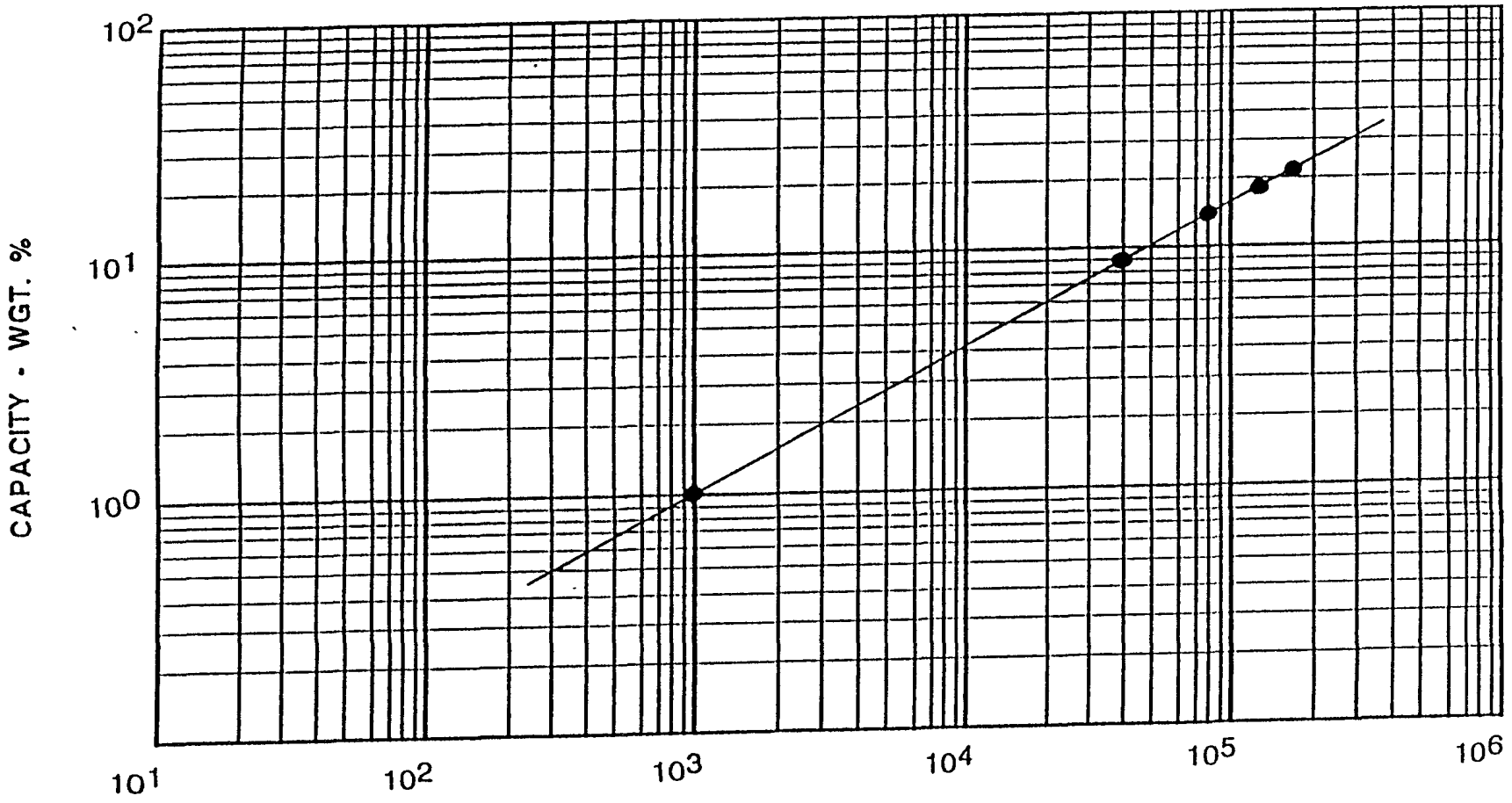
L-1 CARBTROL PIPING KIT



- 10 GPM FLOW CAPACITY PER TRAIN (AS SHOWN ABOVE).
- TRAINS CAN BE MANIFOLDED IN PARALLEL.FOR HIGHER FLOWS.
- MANIFOLDS FOR UP TO 60 GPM.IN STOCK.

FIGURE I

ADSORPTION ISOTHERM



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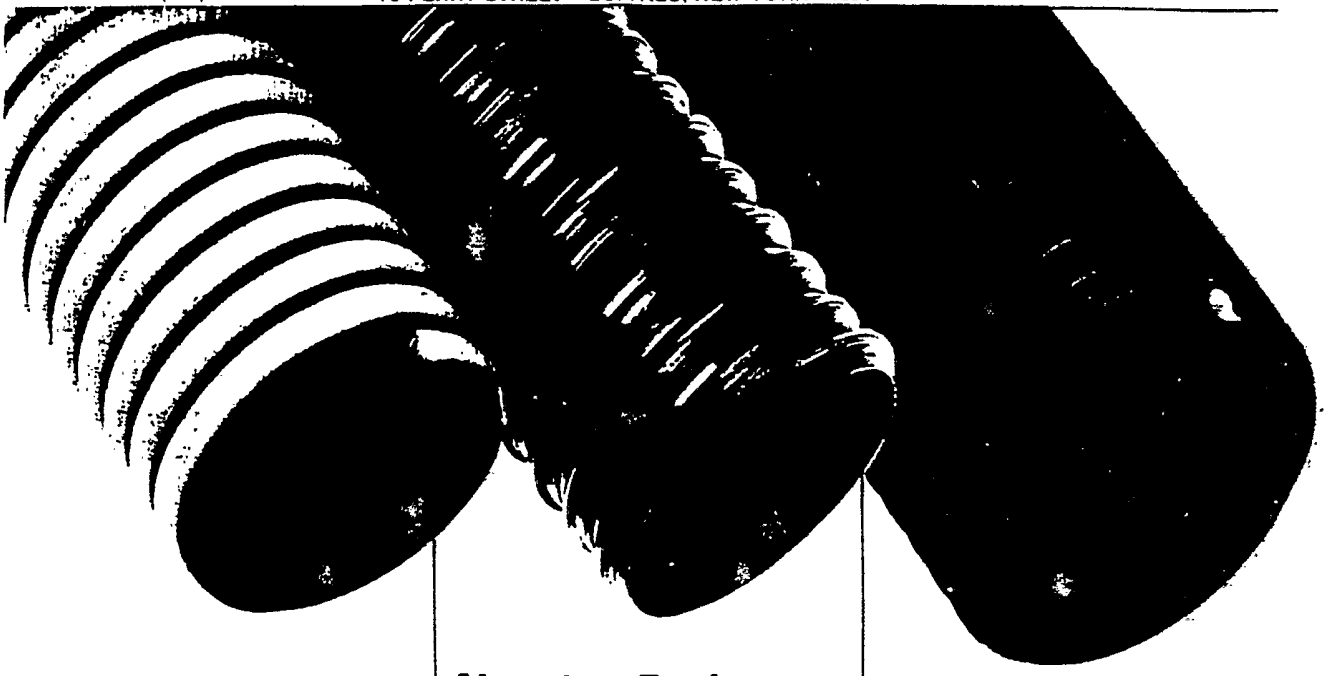


All Weather EPDM Suction Hose

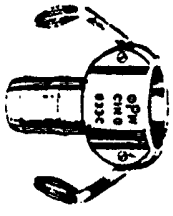
SERIES 300EPDM (100%)

I.D., Inches	O.D., Inches	PITCH, Inches	MINIMUM BENDING RADIUS 72°F, Inches	WORKING PRESSURE 72°F, P.S.I.	BURSTING PRESSURE 72°F, P.S.I.	VACUUM RATING 72°F, In./Hg	WEIGHT, Lbs./Ft.
1	1.34	.30	1.9	50	220	29.8	.23
1¼	1.65	.33	3.2	50	220	29.8	.34
1½	1.84	.35	3.2	50	220	29.8	.40
2	2.43	.39	5.2	50	190	29.8	.67
2½	2.94	.56	5.6	50	190	29.8	.92
3	3.52	.59	7.1	43	150	29.8	1.10
4	4.61	.65	11.0	38	140	29.8	1.84
5	6.69	.87	20.0	23	100	28.0	3.07

Temperature range: −40° to 158°F.

Series 300EPDM (100% EPDM)—General construction and industrial use, agricultural service when limited chemical service is required.

633-C Coupler Hose Shank



Abrasion Resistant EPDM Blower and Ducting Hose

SERIES 620 WD

I.D., Inches	O.D. Inches	PITCH, Inches	MINIMUM BENDING RADIUS 72°F, Inches	WORKING PRESSURE 72°F, P.S.I.	BURSTING PRESSURE 72°F, P.S.I.	VACUUM RATING 72°F, In./Hg	WEIGHT, Lbs./Ft.
4	4.88	.65	4				.73
5	5.88	.87	5				.84
6	6.88	.87	6				1.04
7	7.90	.91	7				1.17
8	8.88	.91	8				1.38
10	10.47	.96	10				2.40
12	12.25	1.22	12				2.50

Specifications will be modified, per your request.

Temperature range −40° to 220°F.

Series 620 WD has been developed for industries where **Abrasive Applications** are present. Ideally suited for collecting grass, street refuse, saw dust, wood chips and similar applications.

Its **High Temperature** resistance makes **Series 620 WD** the perfect hose to handle fumes, exhaust and emissions in various plant applications.

Exterior **Wear Strip** version, **Series 620 WD-WS** is also available.

Kanaflex

All Plastic Heavy-Duty Suction Hose

SERIES 110CL, 110GR

I.D., Inches	O.D., Inches	PITCH, Inches	MINIMUM BENDING RADIUS 72°F, Inches	WORKING PRESSURE 72°F, P.S.I.	BURSTING PRESSURE 72°F, P.S.I.	VACUUM RATING 72°F, In./Hg	WEIGHT, Lbs./Ft.
¾	.95	.22	1.9	86	234	29.8	.16
1	1.23	.22	1.9	86	234	29.8	.26
1¼	1.52	.26	2.7	79	256	29.8	.37
1½	1.78	.30	2.8	72	242	29.8	.44
2	2.38	.33	3.9	72	242	29.8	.74
2½	2.92	.37	4.7	72	242	29.8	1.01
3	3.41	.37	6.1	62	199	29.8	1.21
4	4.50	.43	9.1	55	178	29.8	2.01
5	5.55	.45	14.0	33	120	28.0	2.45
6	6.67	.53	15.0	33	120	28.0	3.37
8	8.83	.70	20.0	28	105	28.0	5.80

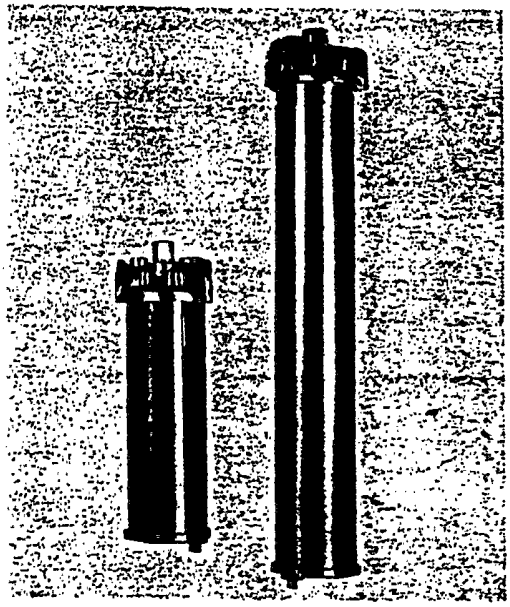
IRRIGATION . . . due to the fact that it's weatherproof, flexible and extremely long-lasting. **Kanaflex** is ideal for the water-transfer needs of agricultural work.

INDUSTRY . . . adaptable to a wide variety of fluid-handling needs in manufacturing situations, the mining industry and construction applications. Resistance to salt-water and salt-air makes **Kanaflex** ideal for marine use.

SANITATION . . . suited for work with cesspools and septic tanks, non-porous and easy to clean.

NOTE: Series 110GR is MSHA approved. Minimum production run required. Contact factory for availability.

1B1 and 1B2 MODEL Cartridge Filter Housings



The 1B1 and 1B2 MODEL Cartridge Filter Housings, three-piece housings featuring centerpost construction, offer a choice of either cast iron and steel or 304 stainless steel as the materials of construction. The 1B1 and 1B2 Model Cartridge Filter Housings have flow rates of up to 16 GPM, and accept working pressures and temperatures up to 175 psig at 250°F.

The 1B1 and 1B2 Model Cartridge Filter Housings are available as one- or two-high cartridge models.

APPLICABLE FILTER CARTRIDGES

Micro-Klean® III (Series U78 and G78)

Micro-Wynd® II

Activated Carbon Cartridge

Betapure®

Betafine®

MPF® II

DESIGN FEATURES

- Construction — Rugged cast iron and steel or long-wearing 304 stainless steel.
- Design — Three-piece housing.
- Centerpost Construction — For quick and easy cartridge changeout.
- All models are available with or without a cartridge bypass valve, which has a 30 psid setting. The 1B2 Model, equipped with the cartridge bypass valve, is available only in cast iron and steel.
- Mounting Pads — Drilled and tapped on housing head for mounting bracket.

Options

- Mounting Bracket; order separately, 35581-01.

STANDARD MODEL SPECIFICATIONS

Table 1 lists standard specifications for the 1B1 and 1B2 Model Cartridge Filter Housings. On Table 1, note that Maximum Operating Pressure is the rating from the housing only. Actual filter operating temperature depends on temperature capability of the filter cartridge.

Operating Data	1B1	1B2
Maximum Operating Pressure & Temperature	175 psig @ 250°F	
Flow Rate	See Table 2.	
Basic Materials of Construction		
Head & Cover	Cast Iron	304 S.S.
Shell	Steel	304 S.S.
Centering Clip	Steel	316 S.S.
Centerpost	Steel	303 S.S.
Shell Gasket	Rubber and Aramid Fiber	
Cap Nut Gasket	Fiber	
Connection Sizes Inlet/Outlet	¾" NPT	¾" NPT
Cartridge Capability	The models are available in one- or two-high configurations. See "Applicable Filter Cartridges for a list of the cartridges used by the units.	
Options	Mounting bracket kit; order separately, 35581-01. Head gaskets are available in Buna N, Neoprene, Viton, Teflon, or EPR; order separately.	

TABLE 1 — SPECIFICATIONS

BENEFITS

- Choice of Materials of Construction
- Easily Mounted
- Quick, Clean, and Convenient Cartridge Changeout
- Saves Time and Labor
- Choice of One- or Two-High Cartridge Models

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CARTRIDGE REQUIREMENTS

The 1B1 Model uses one filter cartridge; the 1B2 Model uses two filter cartridges. See "Applicable Filter Cartridges" for a list of the cartridges used by the units.

HOUSING FLOW

Table 2 lists the maximum recommended flow rates in Gallons Per Minute (GPM) for the 1B1 and 1B2 Model Filter Cartridge Housings. Use the data on Table 2 *only* as a guide to establish housing flow capability; do not use it for filter sizing. Once you know the flow rate for a selected cartridge, then use the table to check that the flow rate falls within the recommended guidelines.

Remember to take into account the amount of contaminant to be removed when selecting a filter.

Housing Model	Inlet/ Outlet	Water	80 SSU	150 SSU	300 SSU	600 SSU	1000 SSU
1B1	3/4"	16	14	13	12	10	8
1B2	3/4"	16	14	13	1	10	8

TABLE 2 — FLOW RATES

STANDARD MODEL DIMENSIONS

Table 3 gives dimensions in inches and shipping weight in pounds for the 1B1 and 1B2 Model Cartridge Filter Housings. To find a dimension, locate the model in the left column and the selected dimension symbol (A-G) in the top row. The square where the row and column meet is the selected dimension.

Housing Model	A	B	C	Shipping Weight
1B1	12 7/8	11 1/4	4 1/4	9 1/2 9*
1B2	22 5/8	21	4 1/4	10 12*

* With Return Valve

TABLE 3 — DIMENSIONS

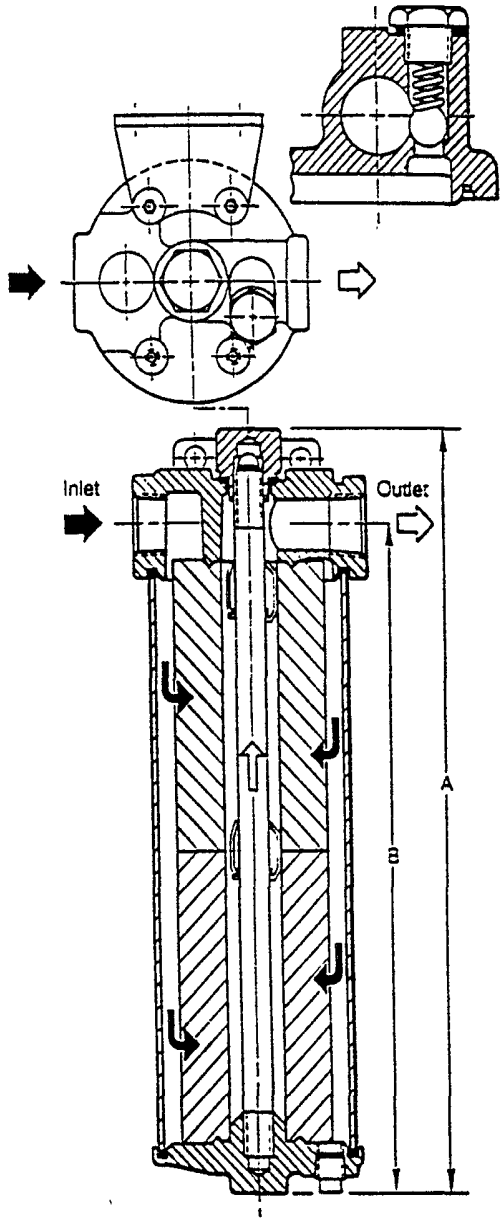

FIGURE 1 — 1B1 AND 1B2 MODELS

REPLACEMENT PARTS LIST

Your CUNO dealer stocks replacement parts for your convenience. To order, specify a description of the item, its material, the quantity desired, and the part number. An (S) next to any part description indicates that CUNO suggests ordering a spare when you place your order.

Table 4 gives complete ordering information.

Description	Material	Quantity	Part Number 1B Model
Head with Bypass	Cast Iron	1	34119-34
Head without Bypass	304 S.S.	1	64896-34
Head for Bypass	Cast Iron	1	34117-34
Cover Assembly	Cast Iron	1	34236-01
	304 S.S.	1	34236-02
Centering Clip	Steel	1	34238-32
	316 S.S.	1	34241-34
Centerpost, 1B1	Steel	1	34238-32
	303 S.S.	1	34238-38
Centerpost, 1B2	Steel	1	34238-33
	303 S.S.	1	34238-39
Shell, 1B1	Steel	1	34237-32
	304 S.S.	1	34237-38
Shell, 1B2	Steel	1	34237-33
	304 S.S.	1	34237-39
Cap Nut (S)	Steel	1	34242-31
	304 S.S.	1	34242-33
Cap Nut Gasket (S)	Fiber	1	34240-46
Shell Gasket(S), Standard	Rubber & Aramid Fiber	2	34239-50
Shell Gasket (S), Optional	Buna N	2	34239-48
	Neoprene	2	34239-51
	Viton	2	34239-49
	Teflon	2	34239-41
	EPR	2	34239-75
Bypass Gasket (S)	Copper & Aramid Fiber	2	26926-31
Screw (S)	Brass	1	23370-31
Ball (S)	Steel	1	32061-32
Spring, 30 psid (S)	Steel	1	32167-36
Mounting Bracket	Steel	1	35581-01

TABLE 4 — REPLACEMENT PARTS LIST

1B1 & 1B2 MODEL ORDERING GUIDE

Plant Code 01 **Product Code 020**

XXXXX-XX

HOUSING MODEL	BASIC CATALOG NUMBER	INLET/ OUTLET NPT	HOUSING MATERIAL
1B1	40292-11 w/o Bypass	3/4"	Cast Iron & Steel
1B1	40297-11 w/ Bypass*	3/4"	Cast Iron & Steel
1B1	40294-11 w/o Bypass	3/4"	304 S.S.
1B2	40292-12 w/o Bypass	3/4"	Cast Iron & Steel
1B2	40297-12 w/ Bypass*	3/4"	Cast Iron & Steel
1B2	40294-12 w/o Bypass	3/4"	304 S.S.

* Cartridge Bypass Valve Set for 30 psid Setting. Mounting Bracket 35581-01, Order Separately.

WARRANTY

Seller warrants its equipment against defects in workmanship and material for a period of 12 months from date of shipment from the factory under normal use and service and otherwise when such equipment is used in accordance with instructions furnished by Seller and for purposes disclosed in writing at the time of purchase, if any. Any unauthorized alteration or modification of the equipment by Buyer will void this warranty. Seller's liability under this warranty shall be limited to the replacement or repair, F.O.B. point of manufacture, of any defective equipment or part which, having been returned to the factory, transportation charges prepaid, has been inspected and determined by the Seller to be defective. THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EITHER EXPRESSED OR IMPLIED, AS TO DESCRIPTION, QUALITY, MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE OR USE, OR ANY OTHER MATTER. Under no circumstances shall Seller be liable to Buyer or any third party for any loss of profits or other direct or indirect costs, expenses, losses or consequential damages arising out of or as a result of any defects in or failure of its products or any part or parts thereof or arising out of or as a result of parts or components incorporated in Seller's equipment but not supplied by the Seller.

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MICRO-KLEAN® III

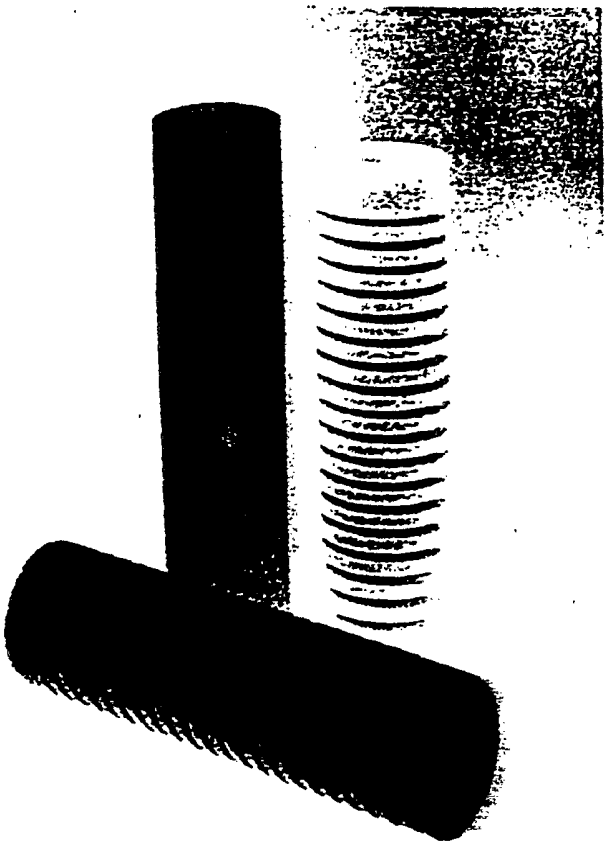
Micro-Klean III is a true graded density depth-type filter cartridge. Advances in both fiber technology and design engineering have combined to produce this rigid filter cartridge, providing enhanced performance and service life with exceptional value in high viscosity and gel removal applications. This nominally rated cartridge exhibits consistent flow rates in both aqueous (Table 1) and non-aqueous applications (Chart 1). Typical applications include paints, inks, adhesives, photographic emulsions, and solvent recovery. Micro-Klean III PX336 is specifically designed for applications in the oil, gas, and petrochemical industries.

Grade	Formulations Available*	Nominal Rating (µ)	Maximum Recommended Flow Rate** (GPM) For Water
Y	8	1	4
A	2,3,8	3	4
B	2,3,8	5	5
C	8	10	5
F	2,3,8	25	5
L	2,3,8	50	5
Q	8	75	8
V	8	100	8
W	8	125	8

Formulation Description: 2 - Cellulose Fiber/Melamine Resin; 3 - Cellulose Fiber/Phenolic Resin; 8 - Acrylic Fiber/ Phenolic Resin. ** Per 9 3/4 inch nominal increment

TABLE 1. - MICRO-KLEAN III AQUEOUS FLOW RATES

The Micro-Klean III filter cartridge is produced using fibers of a controlled diameter and a unique manufacturing process. The result is a cartridge with the open areas between the fibers getting progressively smaller towards the inner wall. This structure traps larger particles on the outer surface while smaller particles are retained within the filter matrix. For more information about cartridge construction materials and ordering, consult your local Cuno distributor and ask for Cuno literature **MK.001** for standard Micro-Klean III product, **MK.PV2** for Paint and Varnish applications, **MK.AG3** for Air and Gas applications, and **MK.PX1** for Oil, Gas, and Petrochemical applications.



CHARGED MICRO-KLEAN® III

The charge modified Micro-Klean III filter cartridge is similar to the uncharged counterpart with the exception that the charged version has a charge modifier. The charge modification adds the benefit of enhanced particle removal by electrokinetic adsorption that was developed for Cuno's Zeta Plus line of premium depth filter media. Since most contaminant particles are negatively charged, the strong positive charge enables the charged Micro-Klean III to remove particles smaller than those removed by mechanical straining alone. Available with a nominal rating of 0.8 microns, typical applications include high purity water system prefiltration.

MICRO-KLEAN III ORDERING GUIDE*

SURFACE TYPE	CARTRIDGE LENGTH	GRADE DESIGNATION		FORMULATIONS AVAILABLE	NUMBER OF CARTRIDGE LENGTHS**	OPTIONS
		GRADE	RATING (µ)			
G - Grooved	7⅞ - 9 3/4"	Y	1	2 - Cellulose/Melamine	1	N - None
U - Ungrooved	80 - 10"	A	3	3 - Cellulose/Phenolic	2	G - Polyethylene Gasket (Patent Pending)
		B	5	8 - Acrylic/Phenolic	3	X - 316 S.S. Core Extender
		C	10		4	P - Polypropylene Core Extender
		F	25			C - O-Ring Connector
		L	50			S - Shrink Wrap Packaging (2 Formulation Only)
		Q	75			T - Tissue Wrap Packaging (2 Formulation Only)
		V	100			
		W	125			

*Basic part numbers in bold text. ** Per 9 3/4 inch nominal increment

HEALTH AND SAFETY PLAN
FOR SALT ROAD CORRECTIVE ACTION PROGRAM
SITE INVESTIGATIONS

XEROX CORPORATION
WEBSTER, NEW YORK

AUGUST, 1996

Prepared by:
H&A of New York

TABLE OF CONTENTS

EMERGENCY PHONE NUMBERS

Xerox Emergency Services	**(Xerox Ext. 123)**
Robert E. Heeks **Xerox Salt Road Project Manager**	**422-7990** **(Xerox Ext. 27990)**
Tracy Wahl **Consultant Project Coordinator**	**422-9918** **(Xerox Ext. 29918)**
Xerox Security	**422-2122** **(Xerox Ext. 22122)**

FIGURES

TABLES

APPENDICES

SITE HEALTH AND SAFETY PLAN FOR SALT ROAD CORRECTIVE ACTION PROGRAM SITE INVESTIGATION XEROX CORPORATION

1.0 INTRODUCTION

Xerox Corporation's Salt Road facility lies at the corner of Salt Road and Mitcheldean Drive in the Town of Webster, New York. The "Site" as here in described comprises Buildings 223,224,225,226,214,210 and 215 surrounding lands, and the agricultural land east of Salt Road, as outlined in Figure 1. This Health and Safety Plan also applies to the OB-97 area located approximately 1,200 feet north of Denham Road north of Building 215.

In evaluating the extent of groundwater contamination at the Salt Road Facility and implementing remedial measures, there is a need to protect the health and safety of personnel involved in site investigation activities. Detailed health and safety procedures will help to prevent injury, illness and accidents by avoiding unnecessary risks while maintaining an efficient work environment.

This Health and Safety Plan was developed for Xerox Corporation and is intended for use during field investigations, water and soil sampling and construction activities exclusively associated with the remediation of groundwater and soil contamination at the Salt Road site. The requirements of the plan will apply to all Xerox personnel implementing the work activities associated with the site remediation. All contractors working on the site are required to adopt their own project - specific Health and Safety Plans (project - specific HSP) which must, as a minimum, contain the requirements of this plan and those of the Xerox Environmental Health and Safety Requirements (Attachment 8 of the Xerox Facility Reference Document.).

Detail concerning safety for treatment system operation and maintenance are contained in the Salt Road Groundwater Remediation System Health and Safety Plan and Safe Job Procedures for Operation and Maintenance Activities.

2.0 OBJECTIVES

The objectives of the Health and Safety Plan are:

- To establish levels of personnel protection and equipment requirements to all scheduled activities and to develop contingency plans.
- To assign on-site health and safety responsibilities.
- To outline mandatory operating procedures.

The provisions of this plan are mandatory for all personnel assigned to the activities described in the respective work plans. The Health and Safety Procedures contained in this plan have been developed for the specific activities intended for the removal of hazardous waste management units and will be periodically reviewed and revised as necessary to keep them current and technically correct.

3.0 SITE DESCRIPTION

The Salt Road Site includes the buildings and lands outlined on Figure 1. The Salt Road Site lies approximately one mile north of US Route 104 which is accessible by Salt Road. The site is about three miles northeast of the Village of Webster. For access to the portion of the Site west of Salt Road, a Xerox pass must be shown to the security guard at the guardhouse location shown on Figure 2. The portion of the Site east of Salt Road is secured by a fence and a padlocked gate. To access, a Xerox badge is required. Xerox Security (Ext. 22122) will open the padlock.

The guardhouse on the east side of Building 224 contains a telephone that is centrally located to all site activities. However, only internal Xerox calls can be made from this telephone. Outside calls may be made from a pay telephone inside the Building 225 entrance, adjacent to the vending machine area.

Water and electrical power are available at the guardhouse as well as other areas associated with the industrial buildings west of Salt Road. Water is not available east of Salt Road. 120 volt power is available at Recovery Wells #6 and #7.

Emergency services are available on-site by contacting Xerox Security (phone-123). The emergency services include emergency medical response and HazMat Spill Team, ambulance, fire and security services. Security personnel are on duty 24 hours a day at the guardhouse located to the east of Building 224 along Salt Road.

4.0 ASSIGNMENT OF RESPONSIBILITIES

To coordinate the health and safety aspects of the project, the following individuals are necessary:

4.1 Xerox Project Manager

The Xerox Project Manager is responsible for:

- Project Management
- Communicating site requirements to all personnel
- General supervision of all activities
- Contacting the appropriate medical, fire and emergency personnel
- coordinating the work of Xerox Corporation and contractors.

4.2 Xerox Operations Safety Representative

- Reviews project-specific HSP;
- Provides technical support to Xerox Project Manager;
- Conducts periodic safety inspections of the work site.

4.3 **Contractor/Consultant Project Manager**

- Assumes responsibility of health and safety at the operations level;
- Ensures Xerox Environmental Health and Safety that all tasks received the appropriate review prior to and throughout their duration. The review will occur during discussions held between the Contractor/Consultant Project Manager, Xerox Project Manager, and Xerox Operations Safety Representative;
- Enforces the Xerox Environmental Health and Safety Requirements for project specific activities through formal audits, on-site observation as well making available the necessary facilities and equipment;
- Submits the project-specific HSP and copies of all training and medical documentation to the Xerox Operations Safety Representative.

4.4 **Project-Specific Contractor/Consultant Safety Officer (or project foreman if qualified)**

- Reviews work plans and in cooperation with the Contractor/Consultant Project Manager, prepares and submits the project-specific HSP;
- Reviews contractor's and subcontractor's drawings and specifications for compliance with the Xerox Environmental Health and Safety Requirements;
- Reviews new and supplemental data, (including hazards not previously identified in the project-specific HSP) as the project progresses and updates the project-specific HSP;
- Forwards copies of all HSP revisions and updates the Xerox Project Manager and the Xerox Operations Safety Representatives;
- Coordinates implementation of health and safety requirements with Contractor/Consultant Project Manager;
- Ensures that health and safety aspects of all work activities are adequately implemented and appropriate documentation is maintained;
- Develops and implements the air monitoring program;
- Interprets air monitoring analytical results and forwards copies on a regular basis to the contractor or consultant Project Manager, Xerox Project Manager, and the Xerox Operations Safety Representative;
- Establishes decontamination and emergency procedures in accordance with the Xerox Environmental Health and Safety Requirements;
- Participates n discussions with the appropriate parties during any peer review process involving the project-specific HSP;
- Resolves technical health and safety issues that arise during the course of the specific project;
- Assures that the contractor or consultant and subcontractor project personnel are trained on he project-specific HSP;
- Ensures copies of Material Safety Data Sheets (MSDS) are maintained on-site and included in the project-specific HSP;
- Maintains on-site and supplies to Xerox Operations Safety Representative all appropriate records and documentation;
- Conducts field health and safety audits. Copies of the audit documents will be sent to the Xerox Project Manager and Xerox Operations-Safety Representative;
- Has the authority to stop operations if necessary.

4.5 Contractor/Consultant Site Coordinator (or project foreman if qualified)

- Responsible for day to day implementation of the Xerox Environmental Health and Safety Requirements and the project-specific HSP;
- Ensures that appropriate personal protective equipment and monitoring equipment is properly maintained and utilized;
- Conducts routine air monitoring;
- Monitors the safety performance of all field personnel;
- Corrects any observed work practices or conditions that may result in injury or exposure to hazardous substances;
- Prepares and submits Xerox accident/incident reports (SAR);
- Ensures appropriate Safe Work Permits or Hot Work Permits are obtained from Xerox Operations Safety or Xerox Fire Marshals, respectively;
- Maintains a daily log book for recording all significant health and safety activities and incidents;
- Suspends work in the event of an emergency, and implements any necessary corrective action.

4.6 Field Personnel

The personnel needed to perform the activities outlined above will be briefed on the anticipated hazards and trained in accordance with OSHA requirements (1910.120, 134) on available respirator equipment, safety practices, emergency procedures and communication pathways (as per Chapter 17). Project-specific training will be accomplished in a health and safety briefing and attendance will be required for all personnel.

5.0 Potential Hazards

The potential hazards at the site consist of the presence of organic solvents in the soil and groundwater underlying the site vicinity, and the work activities involving the use of drilling rigs, excavation equipment and other machinery necessary for field investigation and implementation of remedial measures.

5.1 Chemical Hazards

The following organic compounds have been identified by soil and water sampling in the site vicinity:

Trichloroethene	1,2-Dichloroethane
1,1-Dichloroethane	1,2-Dichloroethene
Methylene chloride	1,1,1-Trichloroethane
Toluene	Tetrachloroethene
Vinyl chloride	Benzene
1,1-Dichloroethene	Ethylbenzene
Chloroform	P-xylene
	M-xylene
	O-xylene

Personal exposure limits (PELs) for primary contaminants present are included in Table 1.

Additionally, groundwater treatment processes currently in use on-site utilize solutions and gas as follows:

Hydrogen peroxide	(50% solution)
Sodium hypochlorite	(15% solution)
Ozone gas	(2.5% by weight in air)

The potential routes of exposure for theses materials include inhalation, skin absorption, ingestion and skin/eye contact. The potential for exposure through any one of these routes will depend on the activity conducted. Most likely routes of exposure for the activities t be conducted at the site include:

Activity	**Potential Routes of Exposure**
Drilling and Soil Sampling	INH, ABS, CON
Soil Vapor Sampling	INH, ABS, CON
Hydrogeologic Testing	INH, ABS, CON
Excavation of Contaminated Soil	INH, ABS, CON
Construction (including blasting)	INH, ABS, CON
Water Quality Sampling	INH, ABS, CON, ING
Groundwater Remediation	INH, ABS, CON, ING

Note:

INH = Inhalation
ABS = Skin Absorption
CON = Skin/Eye Contact
ING = Ingestion

The greatest risk to workers will occur when the work directly exposes personnel to high concentrations of materials in contaminated soil or groundwater. The activities most likely to expose workers to these conditions include, but are not limited to, the excavation and removal of contaminated soil, construction activities, and drilling and soil sampling in the vicinity of the contaminated source areas. Additional exposure may occur during various work activities associated with the porcess utilized into he treatment of groundwater.

The risk associated with the soil sampling program should be less than for drilling and construction activities because penetration of the ground surface is limited to a small diameter (1/2 in.) hole advanced to a depth between 2 to 3 feet below ground surface. Workers performing the survey can potentially be exposed by direct contact with contaminants retained on the sampling equipment.

Hydrogeologic testing potentially exposes workers to risks at two different levels, depending on the activity conducted. Water quality sampling from wells and the falling head permeability tests conducted on monitoring wells may expose workers to vapors emanating from the bore holes or to contaminants introduced onto sampling or water level measurement devices. All of the wells are located in open areas with ample circulation, and vapor concentrations should be non-detected in the breathing zone. Pumping tests conducted on wells installed in areas of groundwater contamination have a potential for exposing workers to contact with contaminated groundwater and to vapors from the pumped water.

5.2 Physical Hazards

Several physical hazards may pose a threat to worker safety during Site activities.
These include:

- Heat and cold stress in conditions of extreme temperatures.
- Hazards associated with excavations, operation of equipment, and other construction activities.
- (See also Chapters 10 and 11 and Section 7.5).
- Biological Hazards

5.2.1 Extreme Temperature Conditions

Since the Site activity will be conducted both during the winter and summer months, precautions should be taken by the workers to prevent cold and heat stress.

Heat Stress

Heat stress occurs in several forms. By order of increasing severity, they are:

1. Heat Rash
2. Heat Cramps
3. Heat Exhaustion
4. Heat Stroke

The potential for a worker to develop heat stress is related to the ambient temperature, relative humidity and the nature of the work being performed. Please refer to Table 2 of this document for additional information and guidelines.

Cold Stress

Cold Stress, as well as heat stress, occurs in different forms. By order of increasing severity, they are:

1. Trench Foot
2. Frostbite
3. Hypothermia

The potential for a worker to develop cold stress is related to the ambient temperature, wind chill, protective clothing and the nature of the work being performed. Please refer to Table 3 of this document for additional information and guidelines.

5.2.2 Hazards Associated with Excavations, Operation of Equipment, and other Construction Activities.

For many site activities, physical hazards are greater than chemical hazards. Safety requirements established under 29 CFR 1910, and 29 CFR 1926, such as 1926.650 (Excavations, Trenching and Shoring), 1926.550 (Cranes, Derricks, Hoists, Elevators, and Conveyors) and others, where appropriate, must be addressed at the task specific level and included in the project-specific HSP. Some of the potential physical hazards anticipated with site work are discussed below.

5.2.2.1 Sampling

Field sampling operations may include the collection of soil, soil vapor, and groundwater samples. The physical hazards of these operations are primarily associated with the sample collection and methods utilized as described below.

- **Manual Sample Collection:**

  The physical hazards associated with manual sample collection are primarily limited to sprains/strains resulting from hand augering, hand bailing a well, or installing soil vapor sampling equipment in hard soil or through concrete.

- **Heavy Equipment Assisted Sample Collection:**

  Potential hazards may also be encountered during continuous split spoon sampling when drilling rigs and hollow stem augers are utilized for sample collection. The collection of soil samples from test pits, trenches or other excavations and also creates a potential for excavation hazards and may require confined space entries and shoring.

5.2.2.2 Drilling

The primary physical hazards associated with drilling operations are generally associated with placement and operation of the drill rig.

Drill rig operations may present such hazards as being struck by flying or falling objects during the raising or lowering of the derrick and sampling hammer, the rigging of drill bits and casing, potential for physical hazards that may cause personnel to slip, trip, or fall.

Underground and overhead utilities must be properly identified and located in the field. Local utilities as well as Xerox Plan Engineering will be contacted and requested to identify and mark buried utility lines prior to the start of intrusive operations. Please refer to Chapter 10 for additional guidelines.

5.2.2.3 Excavating and Trenching

The primary hazards of excavation activities for the purpose of sampling (i.e., removal of contaminated sampling (i.e., test pit sampling) or remediation (i.e., removal of contaminated materials for subsequent disposal, or installation of piping or electric lines) include:

- Potential cave-ins due to heavy equipment operation or changing soil/weather conditions;
- Slip/trip/fall hazards related to equipment handling and/or uneven or unstable surfaces;
- Excessive noise from on-site equipment.

Entry of personnel into site excavations present addition potential hazards of confined space entry. Potential hazards associated with confined space entry include the following:

- The possible build-up of toxic, combustible, or oxygen deficient/enriched atmospheres;
- Uneven/slippery surfaces;
- The physical isolation of the employee(s) when in need of rescue.

Please refer to Chapter 11 for additional guidelines.

5.2.2.4 Blasting Operations

For operations involving subsurface blasting, the Contractor/Consultant Project Manager and Contractor/Consultant Safety Officer will include the following, at a minimum, in the project-specific HSP:

- All operations will be conducted in accordance with the applicable chapters of 20 EFR 1926 subpart U;
- Detailed Scope of Work, including sizes of proposed charges, types; locations, depths, etc.;
- Documentation of blasting team qualifications, (e.g., training certificates, resumes);
- Procedures t be followed for bringing explosives onto Xerox property;
- Procedures for on-site storage of materials;
- Procedures to be followed in the event of a misfire;
- Procedures for controlling the area, including necessary assistance from Xerox Security;
- Types of signage and signaling to be used during the operations;
- Vibration thresholds as recorded by seismograph readings to protect utilities and adjacent buildings, and procedures for taking these readings.

The Contractor/Consultant Project Manger and the Contractor/Consultant Safety Officer will also:

- Assure blasting mats are used during the operations;
- Assure all utilities have been properly identified and precautions implemented to prevent damage.

The Xerox Project Manager must:

- Issue a **Green Sheet** (Xerox internal publication) stating the planned operations and the blasting date(s);
- Assure that Xerox Plant Engineering and Maintenance has been properly involved with plan review to ensure blasting will not effect the structural integrity of any nearby buildings or utilities.
- Assure that Xerox Operations Management has been properly involved in planning of blasting activities.

5.2.2.5 Biological Hazards

Depending upon seasonal conditions, numerous types of pests may be present, including mosquitoes, snakes and ticks. The following are guidelines:

- Site personnel are encouraged to wear knee high chemically resistant boots while in the work zones to protect feet and lower leg areas.
- Site Personnel may use insect repellents before donning Personal Equipment (PPE) providing the repellent will not interfere with sampling and/or analysis of media.
- Site personnel should perform a frequent self-inspection for the presence of ticks and take appropriate measures if detected. In many parts of the Northeastern United States, tick-borne diseases pose a potential health risk.
- A first aid kit with insect repellent and treatment should be available for use in the field.

6.0 HAZARDS ASSOCIATED WITH THE GROUNDWATER TREATMENT SYSTEM

Current groundwater treatment processes utilized a highly reactive solution of 50% Hydrogen Peroxide (H^2O^2), 15% Sodium Hypochlorite solution (NaOC1) and ozone gas with the capacity to be generated beyond safe limits.

Well Field

An holding tank for 15% Sodium Hypochlorite is located within each metal pump house. The Sodium Hypochlorite transfers to the well heads by use of Polyethylene tubing and a fluid metering pump. Work activities filling or submersible pumps or water level transducers may result in exposure to Sodium Hypochlorite. The Sodium Hypochlorite treatment system is not currently in use, however the equipment remains in the well houses for possible future use.

The minimum protection required for work within the recovery well pump houses is:

- Leather or chemical resistant Boots/shoes
- Safety glasses
- Chemical resistant gloves
- Chemical resistant clothing (Tyvex suite) or work uniform.

Portable eye wash stations are located inside each pump house with instructions for use on the eye wash container. These are maintained by Xerox Maintenance at Ext. 24401.

6.2 Building 348

A 50% solution of hydrogen peroxide is stored and used within Building 348 for groundwater treatment. The peroxide is stored in an outside 6,000 gallon holding tank. The peroxide is transferred to the groundwater treatment tank by means of stainless steel piping and a fluid metering pump. Work activities involving metering pump repair, calibration or priming may result in exposure to hydrogen peroxide. The peroxide may also leak from plumbing joints. A lack of a complete hydrogen peroxide reaction within the treatment chamber may result in residual levels of peroxide in the water effluent.

Ozone gas (0_3) is generated within Building 348 by a high voltage generator and is transported to the treatment tank by compressed air. The ozone has the potential to leak at plumbing joints, seals, treatment tank head space or to the carried over the ambient air via air gaps in the transfer tank piping. Ozone that collects in the treatment tank head space is drawn through an ozone destroying catalyst and discharged to the airstipper through the off gas piping.

Several safety devices and procedures have been placed in Building 348 to minimize ozone related hazards. The safety devices include ozone gas monitors with automatic treatment system shutdown relays, local warning lights and ozone destroyer mechanisms. Treatment system shutdown relays, when tripped, will alert security in Building 317 of the problem. Safety procedures include periodic inspection and monitoring of potential ozone leakage areas and ozone monitor observations prior to building entry. The ozone monitors are calibrated on a regular basis by Treatment System Operations personnel. They are set to trip at 0.1 ppm (OSHA - PEL) and will shut the entire treatment system down if instantaneous ambient levels exceed the OSHA-PEL. If, at any time, ambient ozone levels exceed 0.1 ppm, the building should be evacuated and **Security notified** at extension **22122**. The buddy system is a requirement during any interior activities.

Groundwater treatment processes may expose workers to toxic solutions and / or gas as a result of filling or moving of solution holding tanks, repairing or priming of metering pumps, removal or replacing of submersible pumps / water level transducers; plumbing joins, or seals on treatment tank head space. Material Safety Data Sheets (MSDS) are contained in Appendix A. Additional information on treatment system safety during operation and maintenance activities is contained in the Salt Road Groundwater Remediation System Health and Safety Plan and Safe Job Procedures for O&M Activities.

7.0 HAZARD CONTROL

7.1 Engineering Controls

Engineering controls will be the method of preference to control health and safety hazards. Examples of engineering controls are:

- The use of excavation equipment to take samples from trenches;
- The use of cover material (soil) to suppress vapor emissions;
- The use of air conditioning in heavy equipment cabs to mitigate operator heat stress;
- The use of ventilation equipment to eliminate hazardous atmospheres from confined spaces.

Administrative controls and personal protective equipment will be used where engineering controls are not feasible or are inadequate. Administrative controls include the exclusion of unnecessary personnel from hazardous areas. It should be noted, scheduled job rotation is not an acceptable administrative control to reduce employee exposure to airborne chemicals.

The hazard control methods to be employed must be described in the project specific HSP. As a project progresses, changes to these methods maybe e necessary. All such changes will be documented as addenda to the project-specific HSP.

7.2 Standard Safe Work Practices

Standard Safe Work practices applicable to most site activities are listed below. Additional safe work practices unique to specific site tasks must be included in the project-specific HSP.

1. All field personnel must inform the Contractor/Consultant Site Coordinator or designated representative before entering work areas so that their presence can be recorded in the log book.

2. Workers must utilize the **"buddy system"**: At least two members of the field crew (including subcontractor personnel) must be in visual contact with each other on-site whenever work is to be performed. If this is not possible, two-way radios will be used.

3. Eating, drinking, chewing gum or tobacco, smoking, or any other activity that increases the probability of hand-to-mouth transfer of contaminated material will not be permitted at the work site.

4. All personal safety equipment and protective clothing will be worn in conformance with the project-specific HSP.

5. Disposal outer coveralls, boots and gloves will be secured at the wrists and legs, and there will be closure of the suit around the neck, if skin contact is of significant concern.

6. Individuals getting wet to the skin with chemically contaminated liquids must remove clothing and wash the affected area immediately at a location to be identified in the project-specific HSP. Clothes wet with such liquids must be changed. Any skin contact with such liquids, whether considered safe or not, will be dealt with immediately and as completely as possible. Medical attention should be sought as necessary.

7. Hands must be washed before eating, drinking, smoking and before using toilets at the facilities provided.

8. Avoid contact with surfaces either suspected or known to be contaminated; such as puddles, mud, or other discolored surfaces. Store equipment on elevated or protected surfaces to reduce the potential of incidental contamination.

9. Only remove personal protective equipment in the contamination reduction zone as specified in the project-specified HSP.

10. Place all disposable coveralls, gloves, and cartridges in appropriate receptacles at the end of every shift or sooner, as directed by the Contractor/Consultant Site Coordinator.

11. Inspect all non-disposable clothing (i.e. hard hat liner, work gloves, cotton overalls) for contamination in the contamination reduction zone. Any clothing found to be contaminated will be decontaminated or disposed of in a manner approved by the Contractor/Consultant Site Coordinator.

12. Report all injuries to the Contractor/Consultant Site Coordinator, Xerox Project Manager, and Xerox Medical. A Xerox Supervisor Accident Report (SAR) or equivalent must be completed by the Contractor/Consultant Site Coordinator and submitted to the Xerox Operations Safety Representative for appropriate follow-up.

13. The presence or consumption of alcoholic beverages or illicit drugs on Xerox property or during the work day is strictly forbidden.

14. Spillage or splashing of contaminated materials must be prevented. Spills must be contained in accordance with the Spill Containment Program of the project-specific HSP.

15. Be alert to unsafe conditions or acts and notify the Contractor/Consultant Site Coordinator.

16. Workers need to be familiar with the work area and surroundings, including:

    - Wind direction in relation to the work area;
    - Accessibility of associates, equipment, vehicles;
    - Available communications;
    - Hot zone (areas of known or suspected contamination);
    - Site access;
    - Nearest water sources.

17. The number of personnel and equipment in the exclusion zone must be kept to a minimum.

18. Wastes generated during work activities must be disposed of in accordance with state, federal, local, and Xerox regulations.

7.3 Safe Work Permits/Hot Work Permits

Safe Work Permits are to be obtained from the Xerox Operations Safety Representative before any work is done that involves:

- Entering vessels, tanks, pits trenches, manholes, or other confined spaces, such as the collection vault located north of Building 348.
- Exposure to toxic or infectious material or to abnormal temperatures or pressures when such exposures are outside the employee's daily routine.
- Using explosives for blasting or demolition.
- Using flammable or combustible coatings inside buildings. Application of combustible paints by brush or roller is excluded.
- Excavating and trenching.
- Working in elevated areas such as roofs.
- Using temporary heating devices
- Working in designated safe work permit areas.

Hot Work Permits are to be obtained from the Xerox Fire Marshal before any work is done that involves:

- Operating gasoline powered vehicles or equipment inside buildings.
- Cutting, welding, lead burning, tar kettles, or similar work involving open flames or very high temperatures. In explosion prone areas, this includes any potential source of ignition, such as electric hand tools.

7.4 Working in Confined Spaces

A confined space, as defined by OSHA, is any space having a limited means of egress which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere.

The Xerox definition adds to the OSHA definition any space subject to the accumulations of physical agents (causing engulfment), and/or an oxygen enriched atmosphere. Confined spaces are also areas where occupants are rendered isolated from help in case of need. Confined spaces include, but are not limited to:

- Ovens
- Manholes
- Underground utility vaults
- Tunnels
- Pipelines
- Excavations
- Trenches

7.4.1 Confined Space Entry

- A Safe Work Permit will be issued prior to entry into the confined space. This permit must be completed including the signatures of the Contractor/Consultant Safety Officer and Xerox Operations Safety Representatives.

- Only authorized, trained personnel may enter a confined space.

- Open flame devices will not be used to open frozen or otherwise shut manhole covers, hatches or doors. Hot water or steam will be used to remove ice and snow holding such openings closed.

7.4.2 Confined Space Ventilation

The confined space will be ventilated to prevent the accumulation of:

- Flammable vapors in excess of 10% of the lower explosive limit.

- Toxic and other contaminants in the atmosphere above one half of the TLV or XEL

7.4.3 Safety Concerns

Xerox requires the use of a safety harness and extraction device when working in confined spaces.

A standby employee will be stationed outside the entrance to the confined space to observe or communicate with the employee at all times. Communications (visual, voice, or signal line) will be maintained between all individuals present. The standby employee will be trained and equipped to initiate rescue operations.

7.5 Utility Clearance

Utility clearance will be obtained by the Contractor/Consultant Project Manager from Xerox Facilities personnel and any local utilities such as Rochester Telephone, Rochester Gas and Electric, and Webster Town or Village before the start of any drilling or excavation conducted at the site.

- Xerox utility clearance should be obtained from Plant Engineering and Maintenance.
- Other local utility clearance can be obtained by calling the toll-free-hotline. Dig up Alert at (800) 962-7962 and record the "reference numbers for possible future use.
- All utilities in the work area should be staked at least two weeks prior to the start of work.
- All activities must be explained in detail to the respective utility by the Contractor/Consultant Site Coordinator. For some activities, such as blasting, the utility may request to have a representative at the site to expedite emergency response.

8.0 GENERAL HEALTH AND SAFETY

Protective clothing and respiratory protection help prevent workers from coming in contact with potential hazards. Personnel protective equipment must be appropriate to protect against the anticipated hazards for each of the activities outlined above.

8.1 Air Monitoring

Continuous air monitoring will be performed during the activities for which inhalation has been identified as a potential exposure route, namely, during drilling and soil sampling, excavation of contaminated soil and construction activates associated with site remediation. Continuous air monitoring will also be performed during pump testing of wells where over 1 ppm was detected in the breathing zone during well drilling.

Monitoring will be conducted with a photoionization detector equipped with an 11.7 EV lamp or a flame ionization detector. These instruments are capable of detection the primary contaminants listed in Table 1 to an approximate detection limit of 1 ppm. These instruments are not intended for the use in identifying or qualifying the presence of ozone, hydrogen peroxide, and sodium hypohchlorite. The TLV's established by OSHA for an eight hour workday for the compounds listed in Table one are above the detection limit of the proposed equipment. The rapid response of the instruments allow for quick determination of potential contaminants in the air and changes in the he safety procedures can be implemented if needed.

8.2 Respiratory Protection

The decision to don respirators during a particular activity will be based on the results of the air monitoring performed during the site activity. Personal protective equipment requirements will be based on Action Levels outlined in Table 4 and project-specific conditions. Please also see Section 7.4 of this Plan.

8.3 Personnel Protective Equipment

The minimum level of personnel protection to be implemented at the site will be Level D as described in "Standard Operating Safety Guidelines". (USEPA November 1984). Workers will not wear contact lenses during site activities. The required equipment includes:

- Leather or chemical resistant boots/shoes
- Safety glasses
- Chemical resistant gloves

For the drilling and soil sampling, Hydrogeologic testing, excavation, construction activities or other activities which may potentially expose workers to contaminated soil, the level D program will be modified to include, in addition to the items listed above, the following:

- Chemical resistant clothing (Polyethylene coated suit)
- Respirator availability
- Hearing protection in situations where sustained noise exceeds the Xerox
- Limit of 85 decibels
- Hard hat (for drilling and excavation activities)

For work conducted within the groundwater well pump houses, and Building 348, the minimum protection will include the following:

- Leather or chemical resistant boots
- Safety glasses
- Chemical resistant gloves
- Respirator availability

8.4 Contingency Plan

If total concentrations of organic vapors above 1 ppm, are detected in the breathing zone, work will cease immediately under direction of the Contractor/Consultant Project Managers and the Xerox Operations Safety Representative. The hazard control methodology will then be reviewed and the Health and Safety Plan updated. Work will be resumed based on the results of the hazard control methodology review.

9.0 WORK AREAS

Work areas for the above outlined activities will include a minimum 50 foot radium around drilling and sampling operations, excavations, and construction activities. All workers and personnel within the 50 foot work area radium will be required to comply with site Health and Safety Procedures. The work areas associated with the soil vapor sampling, water quality sampling and hydrogeologic testing activities will include a minimum 25 foot radius of the site activity.

Access to the site is controlled by Xerox Security. Access to all work areas within the site will be controlled by the contractor. When respirator use is required in a work area, access will be restricted by means of barricades or fencing. Any excavation; drilling rig, or construction activity associated with the site remediation will have restrictive access during periods of non-activity if detectable (1 ppm or greater) levels of organic vapor are present at the beginning of the period of non-activity.

10.0 DRILLING SAFETY

Drilling and sampling activities present several potential hazards. Minimizing these hazards requires strict adherence to safe operating procedures.

10.1 Drill Crews

Drillers will be responsible for the safe operation of the drill rig as well as their crews adherence to the requirements of the project-specific HSP. The driller must ensure that all safety equipment is in proper condition and is properly used. The members of the drill crew will follow all instructions of the driller, wear all appropriate personal protective equipment, and be aware of the hazards and applicable control procedures.

10.2 Rig Inspection

Each day, prior to the start of work, the drill rig and associated equipment will be inspected by the driller. The following checks will be made:

- Vehicle conditions: Check proper operation of brakes, lights, steering mechanism, and horn.
- Equipment storage: All equipment such as auger flights, split spoon samplers, hammers, hand tools, etc. will be properly stored in an appropriate location and will be secured before moving the rig.
- Wire rope, Cat line: All wire rope, cable and cat line will be inspected for signs of wear such as broken wires, a reduction in rope diameter, abrasion, or signs of rust. Worn, frayed, or otherwise damaged wire rope or cable will be replaced.
- Safety equipment: Each rig will have at least one fire extinguisher (Type B/C) and one first air kit.

10.3 Rig Set-up

Each drill rig will be properly blocked and leveled prior to raising the derrick. The rig will be moved only after the derrick has been lowered. The leveling jacks will not be raised until the derrick has been lowered.

Blocking provides a more stable drilling structure by evenly distributing the weight of the rig. Proper blocking ensures that a differential setting of the rig does not occur. Wooden blocks, at least 12 by 12 inches and four to eight inches thick, are recommended and should be placed between the jack swivels and the ground. The emergency brake will be engaged and the wheels that are on the ground chocked.

10.3 Rig Set-up - Cont.

.Site drilling will comply with the following rules:

- Before drilling, the Contractor/Consultant Site Coordinator will ensure an adequate safety zone around the drill rig and associated operations.
- Before drilling, the existence of underground utilities in the work area will be determined and conspicuously marked. (See Section 7.5).
- If drilling is conducted in the vicinity of overhead power lines, proper distance will be maintained between the drill rig and the lines as per OSHA 29 CFR 1926. Subpart N. The proper distance or shielding technique will be stated in the project-specific HSP.

10.4 General Operating Procedures

The operator of the drill rig will only operate from the position of the controls. If the operator must leave this position, the transmission must be in neutral.

When working on the derrick platform, the drill crew should not guide drill rods or pipe into racks by taking hold of a moving line. Materials should not be stored or transported within the derrick. Pipe, drill rods, auger flights, hammers, and other drilling tools should be stored in racks and chained in place. During drilling, penetration hammers will be placed at a safe location on the ground.

10.5 Emergency Procedure for Electrical Contact

If a drill rig contacts an electrical line, it may or may not be insulated from the ground by its ties. Death or serious injury will result if a person touches the rig and the ground simultaneously.

- Under most circumstances, the operator and other personnel on the seat of the vehicle should remain seated and not leave the vehicle. Do not move or touch any part, particularly a metallic part, of the vehicle or drill rig.
- If it is determined that the rig should be vacated, all personnel should jump clear and as far as possible from the rig. Do not step off – jump off; and do not hang on the vehicle or any part of the rig when jumping clear.
- If you are on the ground, stay away from rig and do not let others get near the vehicle. Seek assistance immediately by calling 123.

11.0 EXCAVATION AND TRENCHING SAFETY

11.1 General Excavation and Trenching Safety

The following is a list of minimum requirements for trenching and excavating. Each excavation/trench/shoring project is different, therefore the Contractor/Consultant Project Manager is responsible for evaluating site specific conditions and making appropriate changes in the project-specific HSP in conformance with 29 CFR 1926 Subpart P - Excavation, and Xerox requirements.

- Contact the proper utilities to obtain clearance. Prior to work, review the utilities in the area and be sure they have been staked properly. (See Section 7.5). Before work begins, a Safe Work Permit must be obtained from Xerox Operations Safety Representative as per Section 7.3.
- Be aware that trenches and excavations deeper than four feet are considered confined spaces and require additional safety precautions; such as shoring. If an excavation exceeds four feet in depth, contact the Xerox Operations Safety Representative to review the original Safe Work Permit and ensure that it is adequate.
- The walls and faces of all excavations and trenches more than four feet deep, in which an employee is exposed to danger from moving ground, will be guarded by a shoring system, sloping of the ground, or some other equivalent means. The design of shoring systems must be done by a registered Professional Engineer as per 29 CFR 1926 Subpart P.
- For excavations or trenches in which an employee may be required to enter excavated or other material will be effectively stored and retained at least two feet or more from the edge of the excavation or trench.
- Daily inspections of excavations will be made by the Contractor/Consultant Site Coordinator. If evidence of possible cave-ins or slides is apparent, all work in the excavation will cease until the necessary precautions have been taken to safeguard employees.
- Trenches more than four feet deep will have ladders or steps located so as to require no more than 25 feet of lateral travel.
- Hard hats and other personal protective equipment will be worn at all times during any type of excavating or trenching operation.
- Determine soil composition (e.g., through soil sampling, soil etc.) and other relevant site conditions, with special emphasis on conditions conductive to cave-ins.
- Monitor the atmosphere in and around trenches on a regular basis to check for explosive, toxic or other wise dangerous gases and vapors.

The Contractor/Consultant Project Manager will insure that all employees involved in the excavation activity have appropriate training in safe trenching practices, with emphasis on factors such as:

  - Utility line identification
  - Cave-in prevention measures
  - Recognition of conditions which may cause cave-ins
  - Means of egress from trench

- Water will not be allowed to accumulate in any excavation. Utilize ditches, dikes, pumps, or other means to keep surface water out of trenches. Contact Xerox Environmental Engineering at Ext. 26500 for proper disposal method.
- All open excavations must be well marked and barricaded.

11.2 Cave-in Hazards

The following conditions increase the likelihood of care-in:

- Soil materials composed of unconsolidated, uncompacted, and/or rounded particles. (See 29 CFR 1926 Subpart P - Excavation Standard). Special care must be used when trenching in areas which have previously been excavated and backfilled.
- Soils which have a high water content, or have been subjected to freeze - thaw or frost-heaving.
- Loading of trench walls by adjacent equipment, supplies, structures; "back-dirt" piles, etc.
- Vibration due to equipment operating near excavations.
- Trench walls that are steeper than the angle of repose of the material composing the walls.
- Deep trenches (i.e., high trench walls).

The following precautions should be used to prevent cave-ins in all trenches in excess of four feet deep. These precautions should also be used in trenches less than four feet deep whenever those site conditions just listed indicate the likelihood of a cave-in:

- Sloping: Trench walls should be sloped to the correct angle of repose.
- Shoring: Vertical trench walls (unless composed of solid rock), must be shored and braced, or restrained with moveable trench boxes, to prevent cave-in. Shoring systems must be designed by a registered professional engineer and meet accepted engineering requirements.

12.0 PERSONNEL DECONTAMINATION

Personal decontamination activities will be conducted during all site activities to reduce the potential for contamination of personnel and/or transmission of contaminants off site. The specific decontamination procedure to be used will be determined on a project specific basis.

Disposable personal protective clothing such as tyvex suits or outer gloves will be disposed of in a Xerox industrial waste dumpster at the close of each day's activities or other appropriate container to be located by contractor, such as an open head drum.

If respirators are required during site activities, the organic vapor cartridges will be replaced at least at a minimum after each day's operations or sooner if necessary. The cartridges will be disposed of in the decontamination container. The container will be manifested and disposed as a hazardous waste by Xerox Environmental Engineering.

13.0 EQUIPMENT DECONTAMINATION PROCEDURES

A temporary project decontamination area may be set up near Building 348 on the southeast corner of the 224 Complex, the exact location to be determined by the Xerox Project Manager. Alternate locations, when necessary, may be set up near the job site after approval by the Xerox Operations Safety Representative.

All drilling rigs, backhoes, and construction equipment that will come in contact with contaminated soil or groundwater will be steam cleaned prior to arriving and prior to leaving the site. Prior to leaving the site, the steam cleaning will be conducted in the decontamination area designated for the project.

All well drilling and soil sampling equipment that will penetrate the ground will be decontaminated between each exploration location by the following sequence of cleaning solutions: Clear water rinse, detergent wash, clear water rinse. In addition all soil sampling equipment will be decontaminated between each soil sample with the same sequence of cleaning solutions.

14.0 SITE CONTROLS

14.1 Facility Access and Controls

Workers must be properly badged according to Xerox standards. Questions regarding badging procedures, should be directed to Xerox Badging at Ext. 23266. Supervisors holding a current contractor/consultant picture badge may sign out button badges for their workers on a daily basis.

> **Note**: By signing out button badges, supervisors are attesting to the fact that all employees receiving the button badges have current Contractor Safety Orientation cards in their possession.

The Xerox Project Manager must obtain the necessary gate or building clearance for the workers on the project.

14.2 Work Site Access Control

It will be the Contractor/Consultant Project Manager's responsibility to control access to a site by means of temporary barriers such as flagging tape or fencing. The barrier will be inspected daily for integrity and adequacy by the Contractor/Consultant Site Coordinator.

For sites requiring Level C to Level A PPE (personal protective equipment) the area of field operations will be subdivided into three distinct areas. The extent of the areas is task and location specific. Access to each zone will be controlled with fencing and/or plastic flagging tape. The three areas are defined as:

- **Exclusion Zone**

  The exclusion zone is the area where the highest potential for exposure by dermal or inhalation routes exists. Personal protective equipment is required and a daily log will be kept of all personnel entering this zone. The exclusion zone will be marked off with barricades or barrier tape which will be placed a minimum of 50 feet from the active work area. During field operations this boundary may be expanded by the Contractor/Consultant Site Coordinator based upon observations and / or monitoring measurements. Whenever possible, all field work should be performed upwind from potential contaminant sources.

- **Contamination Reduction Zone**

  The contamination reduction zone is the area immediately adjacent to the exclusion zone. The probability of dermal and inhalation exposure is lower than in the exclusion zone. Typically, contamination reduction zones include facilities for personnel or equipment decontamination. Personal protective equipment worn in the exclusion zone may not be worn outside the contamination reduction zone except during emergencies.

- **Support zone**

  Support zones cover all areas outside the contamination reduction zone. Typically, the support area includes facilities for a lunch area, office spaces, and clean equipment and material storage. Protective clothing worn in the exclusion zone may not be worn in a support zone except in emergencies. Emergency procedures are outlines in Chapter 15.0.

14.3 Visitors

Visitors and subcontractors entering the site are subject to the same requirements as contractor and consultant personnel and will only be permitted in the immediate area of active operations (i.e. exclusion zone) after receiving written approval from the Contractor/Consultant Project Manager, and supplying a written agreement to comply with to comply with the Xerox Environmental Health and Safety Requirements and this plan.

A visitors log will be kept by the Contractor/Consultant Site Coordinator or other designated person.

Visitor vehicles are restricted to support zones.

14.4 Unauthorized Personnel

All established procedures and actions are designed to prohibit unauthorized entry to the work sites. However, if security is violated, the following actions will be taken:

- Unauthorized personnel found within any active site will be reported to the Contractor, Consultant Project Manager, Safety Officer, and Site Coordinator, Xerox Project Manager, and Xerox Operations Safety Representative.

15.0 Medical Emergency Plan

During site activities, unpredictable events such as physical injury, chemical exposure, fire or explosions may occur. The emergency plan is described in order to provide prompt responses to emergency situations. The emergency plan provides information concerning Xerox Corporation gate house locations, emergency contacts such as the Xerox Security Department, a map of site area showing access routes for ambulance response and contact for medical and fir emergencies.

15.1 Personnel Injury

In case of personnel injury at the site the following procedures will be followed:

- Field team members trained in first aid should administer care to the injured worker.
- Dial Xerox Emergency Service (phone 123) for emergency assistance.
- Injured personnel should be transported to the Xerox Medical Facility or to the nearest medical center (Rochester General Hospital) as directed by Xerox Emergency personnel.
- The Contractor/Consultant Site Coordinator will prepare and submit a Supervisor Accident Report (SAR) in accordance with standard Xerox procedures.

15.2 Chemical Exposure

If a member of the field crew is exposed to chemicals, the procedure outlined below should be followed:

- Another team member should remove the individual from the immediate area of contamination.
- Precautions should be taken to avoid exposure of other workers to the chemical.
- If the chemical is on the individual's clothing, the clothing should be removed if it is safe tot do so.
- If the chemical has contacted the skin, the skin should be washed with copious amounts of water, preferably under a shower.
- In case of eye contact, emergency eye wash should be used. Eyes should be washed for at least 15 minutes. An emergency eye wash station will be provided at the work site by the Contractor.

15.2 **Chemical Exposure - Cont.**

- If necessary, the victim should be transported to the nearest hospital or medical center as directed by Xerox Emergency Personnel. Also if necessary an ambulance should be called to transport the victim.

- All chemical exposure incidents will be reported in writing by the Contractor/Consultant Site Coordinator on a Supervisor Accident Report (SAR) in accordance with standard Xerox procedures.

16.0 First Aid and Decontamination

There is a possibility the decontamination procedures may interfere with medical treatment or cause more serious health effects in an emergency situation. If prompt lifesaving first aid and medical treatment is required, decontamination procedures should be omitted. If site evacuation is required for health and safety reasons, decontamination of personnel, protective clothing and equipment should be delayed until it is safe to do so. Medical personnel should be mortified to avoid contamination. Handle contaminated person/clothing with protective clothing/gloves.

17.0 Health and Safety Training

Personnel will not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility. Xerox employees, contractors, subcontractors, and consultants who have the potential to be exposed to contaminated materials or physical hazards must complete the training described in the following sections.

17.1 Xerox Contractor Safety Orientation

All Contractor and consultant personnel must attend Xerox Contractor Safety Orientation prior to performing work at the site. The course is given every Tuesday in Building 843 from 9:30 a.m. to approximately 11:00 a.m. This time may change. Contact Xerox Operations Safety or Security. Identification cards, valid for 24 months, are issued to all participants successfully completing the course.

17.2 40-Hour Health and Safety Training

This basic course provides instruction on the nature of hazardous waste work, protective measures, proper use of personal protective equipment, recognition of signs and symptoms which might indicate exposure to hazardous substances, and decontamination procedures. It is required for all personnel working on-site, such as equipment operators, general laborers, electricians, plumbers, supervisors, management, etc. who may be potentially exposed to hazardous substances, health hazards, or safety hazards consistent with 29 CFR 1910. 120. The course must be conducted by a qualified instructor in accordance with 29 CFR 1910.120.

17.3 8-hour Annual Refresher Training

Personnel with 40-hour health and safety training are required to attend an annual 8-hour refresher course to remain current in their training. This course must also be conducted by a qualified instructor in accordance with 20 CFR 1910.120.

17.4 8-Hour Supervisor Training

On-site management and supervisors directly responsible for or who supervise employees engaged in hazardous waste operations must have eight additional hours of Supervisor training in accordance with 29 CFR 1910.120. This course includes but not limited to, elements appropriate to supervising hazardous waste related projects (e.g., accident reporting/investigation, regulatory compliance, work practice observations, auditing, emergency response procedures, etc.).

17.5 Additional Training for Specific Projects

Contractors will ensure their personnel have received additional training on specific instrumentation, equipment, confined space entry, construction hazards etc. as necessary to perform their duties. This specialized training will be provided to personnel before engaging in the specific work activities.

17.6 Documentation of Training

The Contractor/Consultant Project Manager will be responsible for maintaining and providing to Xerox Corporation documentation of its employees compliance with required training. Xerox Corporation will only allow properly trained and qualified personnel to perform work at the site.

17.7 Medical Monitoring

All personnel involved in site activities will be trained in accordance with the health and safety procedures outlined above. In addition, all field personnel will participate in a Medical Monitoring Programs in accordance with OSHA 29 CFR 1910.120,1910.134.

COMPOUND	ROUTE OF EXPOSURE (SEE NOTE)	PSHA PEL (PPM) (1)	ACGITH TLV (PPM) (2)	XEL-TWA (PPM) (3)	IDLH (PPM) (4)
CHEMICALS PRESENT IN GROUNDWATER:					
* Trichloroethene	INH, CON	100	50	10	1,000
* Perchloroethene	INH, CON	100	50	5	500
1,1,1 Trichloroethane	INH, CON	350	350	100	1,000
1,1 Dichloroethene	INH, CON	N/R	5	N/R	N/R
1,2 Dichloroethane	INH, CON	50	10	N/R	N/R
* 1,2 Dichloroethene	INH, CON	200	200	N/R	4,000
* Toluene	INH, CON	200	100	N/R	2,000
Vinyl Chloride	INH,ABS, CON	1	5	N/R	N/R
Methylene Chloride	INH, CON	500	50	20	5,000
CHEMICALS PRESENT IN TREATMENT SYSTEM:					
Hydrogen Peroxide (50%)	INH, CON	1	1	N/R	75
Sodium Hypochlorite	INH, CON	N/R	N/R	N/R	N/R
Ozone Gas (2.5%)	INH	0.1	0.1	N/R	10

* Indicates a primary contaminant (i.e. is present in the highest concentration).

(1) OSHA permissible Exposure Limit: AM. Ind. Hyg. Assoc. J. (50), April 1989, 8 hr. Time Weighted Average.

(2) ACGIH TLV from Threshold Limit Values and Biological Exposure Indices for 1991 - 1992 8 hr. TWA.

(3) Xerox Exposure Limit TWA; N.R = None Reported 8hr. TWA

(4) Immediately Dangerous to Life or Health: NIOSH Guide: June 1990

NOTE:

INH = Inhalation

ABS = Skin Absorption

CON = Skin or Eye Contact

COLD STRESS PRIMER

CONDITION	SIGNS AND SYMPTOMS	FIRST AID
TRENCH FOOT: Prolong exposure of toes/feet to moisture and cold temperatures	Feet/toes are pale in appearance, walking may be difficult; feet are cold, numb and/or stiff; if action is not taken, painful swelling of feet/toes may occur.	1. Bring victim into warm area as soon as possible. 2. Remove wet/frozen boots and socks. 3. Handle feet gently. 4. Do not rub or massage affected area. 5. If condition does not respond to slow warming, treat for frostbite.
FROSTBITE: Freezing of flesh exposed to cold temperature and wind.	**SUPERFICIAL:** Skin is hard to the touch but underlying tissue is soft; skin is white and waxy in appearance; blisters are possible; pain sometimes occurs. **SEVERE:** Skin and underlying tissue is hard; skin is blotchy and blue-gray or yellow-gray in appearance; tissue feels frozen to the touch.	1. Bring victim into warm area as soon as possible. 2. Remove wet/frozen clothing and provide dry clothes or blankets. 3. Elevate and protect frozen area (gently wrap affected part in sheet or warm blankets). 4. If person is conscious, provide warm, sweet, caffeine free drinks or soups (no coffee or tea). 5. Do not break blisters or rub affected tissue. 6. If symptoms persist, seek medical attention immediately.
HYPOTHERMIA: Gradual lowering of body core temperature.	Uncontrolled shivering; numbness; mood changes, drowsiness; decreased level of consciousness; slowed breathing and pulse rate; failing eyesight; decreased coordination; unconsciousness; death.	1. Bring victim into warm area as soon as possible. 2. Remove wet/frozen clothing and provide dry clothes or blankets. 3. If person is conscious, provide warm, sweet caffeine free drinks or soups (no coffee or tea). 4. Seek medical attention immediately.

COLD STRESS PREVENTION:

1. Wear several layers of clothing, preferably cotton or wool.
2. Keep feet dry by wearing waterproof foot gear, avoid standing in wet areas, and remove socks when wet.
3. Maintain warm work break areas (i.e., heated trailer; building, warm truck cab, etc.)
4. Evaluate yourself and others for signs and symptoms of cold stress by reviewing the signs and symptoms described above.
5. Change wet/frozen clothes as soon as possible after they become wet.
6. Shield work areas from the wind by strategically locating vehicle or equipment (assuming a greater hazard will not develop.)

HEAT STRESS PRIMER

CONDITION	SIGNS AND SYMPTOMS	FIRST AID	PREVENTION
Heat Rash	Tiny red vesicles in affected skin area. If the area is extensive, sweating can be impaired.	Apply mild lotions and cleanse the area.	Cool resting and sleeping areas to permit skin to dry between heat exposures.
Heat Cramps	Spasm, muscular pain in stomach area and extremities (arms and legs).	Consume replacement fluids with minerals (salt), Gatorade	Adequate salt intake with meals*. Acclimatization. **
Heat Exhaustion	Profuse sweating, cool (clammy) moist skin. Dizziness, confusion, pale skin color, faint rapid shallow breathing, headache, weakness, muscle cramps.	Remove from heat, sit or lie down, rest, replace lost water with water, Gatorade, take frequent sips of fluid.	Acclimatization. ** Adequate salt intake with meals** Ample water, frequently throughout the day.
Heat Stroke	Hot dry skin, Sweating has stopped. Mental confusion, dizziness, nausea, severe headache, collapse, delirium, coma	HEAT STROKE IS A MEDICAL EMERGENCY. Remove from heat, cool the body as rapidly as possible by immersing in cold water or splash with water and fan. Call 123.	Acclimatization.* Initially moderate workload in heat (9-14 days) Monitor workers' activities.

* American diets are normally high in salt, sufficient to aid acclimatization. However, during the early part of the heat season, (May, June) one extra shake of salt during one to two meals per day can help, so long as this is permitted by your physician. Check with your physician.

** Acclimatization: The process of adapting to heat is indicated by the worker's ability to perform hot jobs with less fluid loss, lower concentrations of salt loss in sweat, and a reduced core (body) temperature and heart rate.

Method to Achieve Acclimatization:
Moderate work or exercise in hot temperatures during the early part of the heat season. Adequate mineral (salt) and water intake. Gradually increasing work -- time in hot temperatures. Avoid alcohol. Normally takes 8 - 14 days for acclimatization. Lost rapidly if removed from strenuous work (or exercise) in hot temperature for more than approximately five days.

Caffeine:
Promotes rapid water loss and may inhibit worker's ability to tolerate heat. Caffeine should be avoided while working.

TABLE 4

HAZARD GUIDELINES AND ACTIONS RESPONSE LEVELS

Type of Instrument	Type of Hazard	Action Response Level (1)	Action Response
Ova HNU Photoinonizer [2]	Organic Vapors/Gases (ppm)	< 1 ppm	Level D
		1 ppm - 5 ppm	Level C
		< 5 ppm	Withdraw and evaluate project conditions. Evaluate hazard control methodologies.

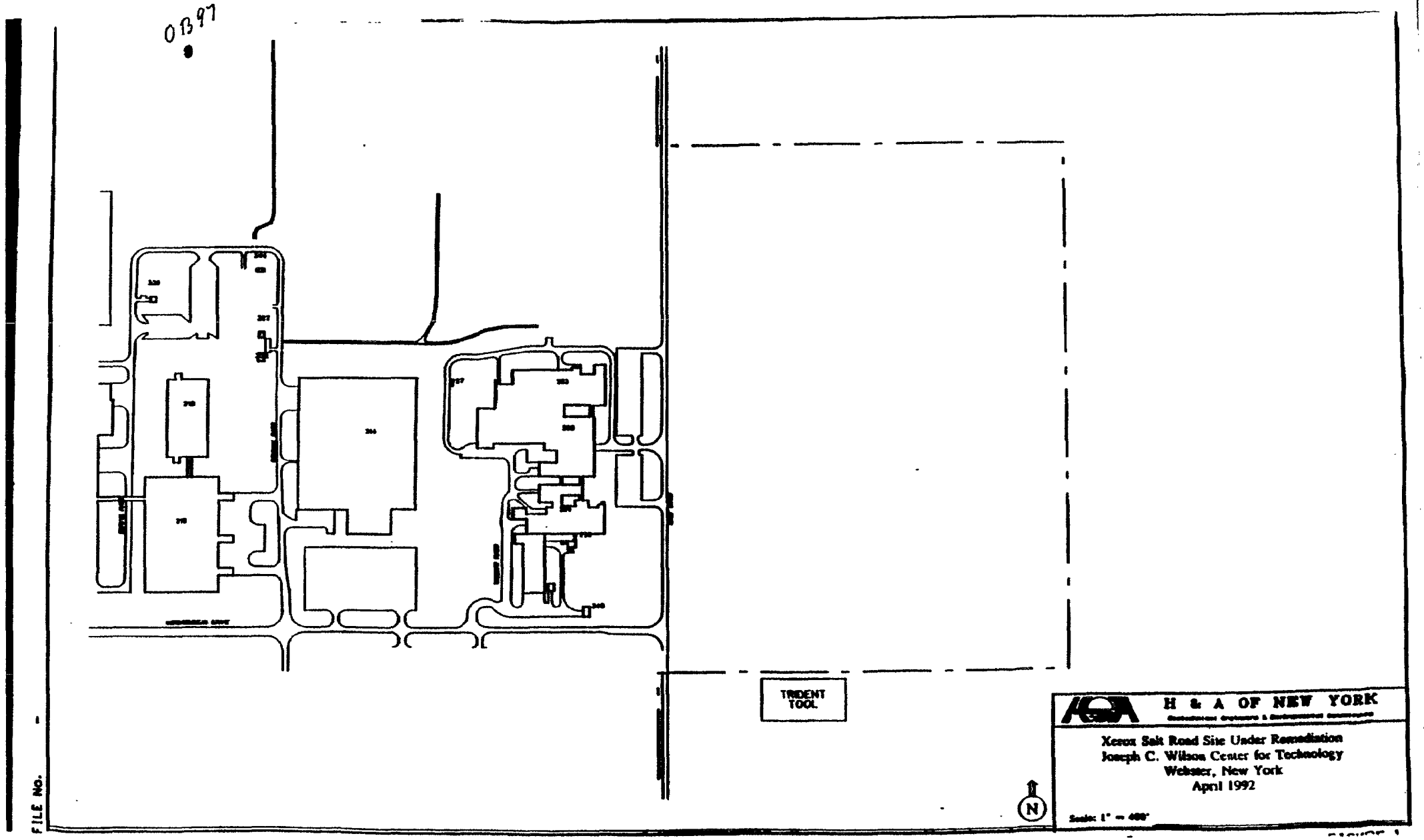
Type of Instrument	Type of Hazard	Action Response Level (1)	Action Response
Combustible Gas Indicator [3]	Explosive Atmosphere (% LEL)	< 5% scale reading	Proceed with work
		5 - 10% scale reading	Monitor atmosphere continuously
		Greater than 10% scale reading	Evacuate from work zone immediately.
			Withdraw and evaluate project conditions. Evaluate hazard control methodologies.

Type of Instrument	Type of Hazard	Action Response Level (1)	Action Response
Oxygen Meter [40]	Oxygen Deficient Atmosphere (% 0_2)	Less than 19.5% 0_2	Terminate work: 0_2 deficient atmosphere
		19.5 - 22% 0_2	Proceed with work
		Greater than 22% 0_2	Terminate work: 0_2 enriched atmosphere

Notes:

1. Monitored in the breathing zone. These are general guidelines provided PPE affords adequate protection at these action levels.
2. Some inorganic species can also be ionized with this analyzer.
3. LEL - Lower explosive limit where the (scale) range is 0 - 100%
4. 0_2 - Normal atmospheric ozygen concentration at sea level is approximately 20.8% oxygen by volume

FIGURE 1


OB97
TRIDENT TOOL
N
H & A OF NEW YORK
Xerox Salt Road Site Under Remediation
Joseph C. Wilson Center for Technology
Webster, New York
April 1992
FILE No.

APPENDIX A

MATERIAL SAFETY DATA SHEETS

COPYRIGHT 1985 SUPELCO, INC. SUPELCO PARK BELLEFONTE PA 16823-0048
ALL RIGHTS RESERVED TELEX 510-670-3600
CUSTOMER P.O. NO. 042689

DATE 4/27/89 MATERIAL SAFETY DATA SHEET 005210 PAGE

SECTION I - GENERAL INFORMATION

CATALOG NO N/A (REORDER PRODUCT BY THIS NO.)
PRODUCT NAME VINYL CHLORIDE . MG/ML, 1ML
DATA SHEET NO I486250
VINYL CHLORIDE
FORMULA MIXTURE FORMULA WEIGHT
CAS NRTECS
SYNONYM ANALYTICAL STANDARD IN METHANOL
MANUFACTURER SUPELCO INC. PHONE 814-359-3441
ADDRESS SUPELCO PARK, BELLEFONTE, PA 16823-0048

SECTION II - HAZARDOUS INGREDIENTS OF MIXTURES

CHEMICAL NAME
COMMON NAME - PERCENTAGE - CAS #
(FORMULA) - TLV(UNITS)
LD50 VALUE - CONDITIONS

ETHENE, CHLORO-
VINYL CHLORIDE 0.02 75
C2H3Cl 1 PPM
500 MG/KG ORAL RAT SEE FOOTNOTE(1,5,6,7)
METHANOL
METHANOL 99.98 67
CH3OH 260 MG/M3
5628 MG/KG ORAL RAT SEE FOOTNOTE(6)

FOOTNOTES

1 CLASSIFIED BY IARC AS A CLASS 1 CARCINOGEN.
5 OSHA REGULATED CARCINOGEN, 29 CFR 1910.
6 SUBJECT TO THE REPORTING REQUIREMENTS OF SARA TITLE III, SECTION 313.
7 CLASSIFIED BY NTP AS A GROUP A CARCINOGEN.

SECTION III - PHYSICAL DATA

BOILING POINT 65 C MM MELTING POINT -98 C
VAPOR PRESSURE 100 MM C VAPOR DENSITY 1.10 C (AI
SPECIFIC GRAVITY .790 G/ML C (WATER=1) PERCENT VOLATILE BY VOL
WATER SOLUBILITY 100 EVAPORATION RATE >1 (ETHER=1)
APPEARANCE CLEAR COLORLESS LIQUID

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 50 F FLAMMABLE LIMITS LEL 6.0 UEL

EXTINGUISHING MEDIA

CO2
DRY CHEMICAL
ALCOHOL FOAM.

SPECIAL FIRE FIGHTING PROCEDURES

WEAR SELF CONTAINED BREATHING APPARATUS WHEN FIGHTING A CHEMICAL FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS

N/A

CATALOG NO N/A (REORDER PRODUCT BY THIS NO.)
PRODUCT NAME VINYL CHLORIDE [illegible]MG/ML, [illegible]ML
DATA SHEET NO I486250
VINYL CHLORIDE
- CONTINUED -

SECTION V - HEALTH HAZARD DATA

LD50 N/A FLM N/A

EMERGENCY AND FIRST AID PROCEDURES

EYES
FLUSH EYES WITH WATER FOR 15 MINUTES.
CONTACT A PHYSICIAN.

SKIN
FLUSH SKIN WITH LARGE VOLUMES OF WATER

INHALATION
IMMEDIATELY MOVE TO FRESH AIR.
IF BREATHING STOPS, GIVE ARTIFICIAL RESPIRATION
CONTACT A PHYSICIAN

INGESTION
NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON
NEVER TRY TO MAKE AN UNCONSCIOUS PERSON VOMIT
GIVE 2 TABLESPOONS OF BAKING SODA IN A GLASS OF WATER
PRESS FINGERS TO BACK OF TONGUE TO INDUCE VOMITING.
IMMEDIATELY CONTACT A PHYSICIAN.

EFFECTS OF OVEREXPOSURE

HARMFUL IF INHALED
MAY BE FATAL IF SWALLOWED
CONTAINS LOW CONCENTRATION(S) OF MATERIAL(S) KNOWN TO THE STATE OF CALIFORNIA TO
CAUSE CANCER.
SUCH CONCENTRATION(S) IS/ARE SUBSTANTIALLY BELOW OSHA HCS THRESHOLDS WHICH WOULD REQUIRE LISTING HEREIN AS A COMPONENT OF THIS MIXTURE.
HEADACHE
NAUSEA
GASTROINTESTINAL DISTURBANCES
BLINDNESS

SECTION VI - REACTIVITY DATA

STABILITY STABLE.

CONDITIONS TO AVOID

N/A

INCOMPATIBILITY

OXIDIZING AGENTS

SECTION VI - REACTIVITY DATA

- CONTINUED -
CHROMIC ANHYDRIDE, LEAD PERCHLORATE, PERCHLORIC ACID

HAZARDOUS DECOMPOSITION PRODUCTS

N/A

HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

CONDITIONS TO AVOID

N/A

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

TAKE UP WITH ABSORBENT MATERIAL.
VENTILATE AREA.
ELIMINATE ALL IGNITION SOURCES.

WASTE DISPOSAL METHOD

COMPLY WITH ALL APPLICABLE FEDERAL, STATE, OR LOCAL REGULATIONS

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFIC TYPE)

WEAR FACE MASK WITH ORGANIC VAPOR CANISTER.

PROTECTIVE GLOVES

WEAR RUBBER GLOVES.

EYE PROTECTION

WEAR PROTECTIVE GLASSES.

VENTILATION

USE ONLY IN WELL VENTILATED AREA.

SPECIAL

N/A

CATALOG NO N/A (REORDER PRODUCT BY THIS NO.)
PRODUCT NAME VINYL CHLORIDE 1MG ML, 1ML
DATA SHEET NO I486250
VINYL CHLORIDE

SECTION VIII - SPECIAL PROTECTION INFORMATION

+ CONTINUED +

OTHER PROTECTIVE EQUIPMENT

N/A

SECTION IX - SPECIAL PRECAUTIONS

STORAGE AND HANDLING

STORE IN SEALED CONTAINER IN COOL, DRY LOCATION.
KEEP AWAY FROM OXIDIZERS.
KEEP AWAY FROM IGNITION SOURCES.

OTHER PRECAUTIONS

AVOID EYE OR SKIN CONTACT.
AVOID BREATHING VAPORS.

WHILE THE INFORMATION AND RECOMMENDATIONS SET FORTH HEREIN ARE BELIEVED TO BE ACCURATE AS OF THE DATE HEREOF, SUPELCO, INC. MAKES NO WARRANTY WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

LAST REVISED 10/17/88

J. T. BAKER CHEMICAL CO. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865

MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY TELEPHONE -- (201) 859-2151
CHEMTREC = (800) 424-9300 -- NATIONAL RESPONSE CENTER = (800) 424-8802

T4940 -01 TRICHLOROETHYLENE PAGE:
EFFECTIVE: 10/14/85 ISSUED: 01/24/8

SECTION I - PRODUCT IDENTIFICATION

PRODUCT NAME: TRICHLOROETHYLENE
FORMULA: C2HCL3
FORMULA WT: 131.40
CAS NO.: 00079-01-6
NIOSH/RTECS NO.: KX4550000
COMMON SYNONYMS: TRICHLOROETHENE; ETHINYL TRICHLORIDE; ACETYLENE TRICHLORI
TCE
PRODUCT CODES: 5376,9454,9455,9464,9473,9458

PRECAUTIONARY LABELLING

BAKER SAF-T-DATA(TM) SYSTEM

HEALTH	-	3 (CANCER CAUSING)
FLAMMABILITY	-	1
REACTIVITY	-	1
CONTACT	-	1

LABORATORY PROTECTIVE EQUIPMENT

GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

PRECAUTIONARY LABEL STATEMENTS

WARNING
HARMFUL IF SWALLOWED OR INHALED
CAUSES IRRITATION
NOTE: THIS MATERIAL OR ITS VAPORS IN CONTACT WITH FLAMES OR HOT GLOWING SURFACES MAY FORM CORROSIVE ACID FUMES.
NOTE: REPORTED AS CAUSING CANCER IN LABORATORY ANIMALS. EXERCISE DUE CARE AVOID CONTACT WITH EYES, SKIN, CLOTHING.
AVOID BREATHING VAPOR. KEEP IN TIGHTLY CLOSED CONTAINER. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING.

SECTION II - HAZARDOUS COMPONENTS

COMPONENT	%	CAS:
TRICHLOROETHYLENE	90-100	79-0

SECTION III - PHYSICAL DATA

BOILING POINT: 86 C (187 F)
MELTING POINT: -73 C (-99 F)
SPECIFIC GRAVITY: 1.47 (H2O=1)
VAPOR PRESSURE(MM HG): 58
VAPOR DENSITY(AIR=1): 4.
EVAPORATION RATE: N/ (BUTYL ACETATE=1)

CONTINUED ON PAGE: 2

SECTION III - PHYSICAL DATA (CONTINUED)

SOLUBILITY(H2O): NEGLIGIBLE (LESS THAN 0.1 %) % VOLATILES BY VOL: 100

APPEARANCE & ODOR: LIQUID WITH CHLOROFORM ODOR.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: N/A NFPA 704M RATING: 1-1-0

FLAMMABLE LIMITS: UPPER - 10.5 % LOWER - 8 %

FIRE EXTINGUISHING MEDIA
USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

SPECIAL FIRE-FIGHTING PROCEDURES
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED (POSITIVE PRESSURE IF AVAILABLE) BREATHING APPARATUS WITH FULL FACEPIECE. MOVE EXPOSED CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

UNUSUAL FIRE & EXPLOSION HAZARDS
CLOSED CONTAINERS EXPOSED TO HEAT MAY EXPLODE.

TOXIC GASES PRODUCED
HYDROGEN CHLORIDE

SECTION V - HEALTH HAZARD DATA

SOME EXPERIMENTS WITH TEST ANIMALS INDICATED THAT THIS SUBSTANCE MAY BE ANTICIPATED TO BE A CARCINOGEN.

THRESHOLD LIMIT VALUE (TLV/TWA): 270 MG/M3 (50 PPM)

SHORT-TERM EXPOSURE LIMIT (STEL): 1080 MG/M3 (200 PPM)

TOXICITY: LD50 (ORAL-RAT)(MG/KG) - 4920
LD50 (IPR-MOUSE)(MG/KG) - 3000

EFFECTS OF OVEREXPOSURE
INHALATION OF VAPORS MAY CAUSE NAUSEA, VOMITING, HEADACHE, OR LOSS OF CONSCIOUSNESS.
INGESTION MAY CAUSE NAUSEA, VOMITING AND LOSS OF CONSCIOUSNESS.

EMERGENCY AND FIRST AID PROCEDURES
CALL A PHYSICIAN.
IF SWALLOWED, IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.

CONTINUED ON PAGE: 3

SECTION V - HEALTH HAZARD DATA (CONTINUED)

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. FLUSH SKIN WITH WATER.

SECTION VI - REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: HEAT, LIGHT, SOURCES OF IGNITION, FLAME

INCOMPATIBLES: CHEMICALLY ACTIVE METALS, STRONG BASES

DECOMPOSITION PRODUCTS: HYDROGEN CHLORIDE

SECTION VII - SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE
WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. STOP LEAK IF YOU CAN DO SO WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. TAKE UP WITH SAND OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIAL AND PLACE INTO CONTAINER FOR LATER DISPOSAL. FLUSH SPILL AREA WITH WATER.

DISPOSAL PROCEDURE
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

EPA HAZARDOUS WASTE NUMBER: U228 (TOXIC WASTE)

SECTION VIII - PROTECTIVE EQUIPMENT

VENTILATION: USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.

RESPIRATORY PROTECTION: RESPIRATORY PROTECTION REQUIRED IF AIRBORNE CONCENTRATION EXCEEDS TLV. AT CONCENTRATIONS UP TO 1000 PPM, A CHEMICAL CARTRIDGE RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE IS RECOMMENDED. ABOVE THIS LEVEL, A SELF-CONTAINED BREATHING APPARATUS IS RECOMMENDED.

EYE/SKIN PROTECTION: SAFETY GOGGLES AND FACE SHIELD, UNIFORM, PROTECTIVE SUIT, NEOPRENE GLOVES ARE RECOMMENDED.

SECTION IX - STORAGE AND HANDLING PRECAUTIONS

S-T-DATA(TM) STORAGE COLOR CODE: BLUE

SPECIAL PRECAUTIONS
KEEP CONTAINER TIGHTLY CLOSED. STORE IN SECURE POISON AREA.

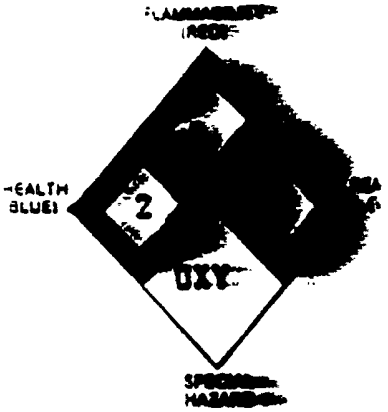
CONTINUED ON PAGE: 4

MATERIAL SAFETY DATA 7722 84 : 3

HYDROGEN PEROXIDE 30%
STANDARD GRADE

NFPA Designation 704

DEGREE OF HAZARD
4 - EXTREME
3 - HIGH
2 - MODERATE
1 - SLIGHT
0 - INSIGNIFICANT



EMERGENCY TELEPHONE NUMBERS
CHEMTREC (800) 424-9300
MEDICAL (303) 595-9048 CALL COLLECT
OTHER (609) 924-6677 CALL COLLECT

REVISION: 09 EFFECTIVE: 04/03/90 PRINTED: 02/26/

EFFECTS OF OVEREXPOSURE

ACUTE EXPOSURE.....: SEVERE IRRITANT TO EYES, NOSE, THROAT, LUNGS AND GASTROINTESTINAL TRACT. MAY CAUSE IRREVERSIBLE TISSUE DAMAGE TO THE EYES, INCLUDING BLINDNESS.

CHRONIC EXPOSURE.....: (EFFECTS CONSIDERED INCLUDE: SENSITIVITIES, CARCINOGENICITY, TERATOGENICITY, MUTAGENICITY, SYNERGISTIC PRODUCTS, AND ANY MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE.)

THERE ARE REPORTS OF LIMITED EVIDENCE OF CARCINOGENICITY OF HYDROGEN PEROXIDE TO MICE ADMINISTERED HIGH CONCENTRATIONS IN THEIR DRINKING WATER (IARC MONOGRAPH 36, 1985). H EVER THE INTERNATIONAL AGENCY FOR RESEARCH O CANCER CONCLUDED THAT HYDROGEN PEROXIDE COUL NOT BE CLASSIFIED AS TO ITS CARCINOGENICITY HUMANS (GROUP III CARCINOGEN). ACCORDINGLY OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1 1200) DOES NOT REQUIRE THAT HYDROGEN PEROXI IDENTIFIED AS A CARCINOGEN.

SENSITIVITIES, TERATOGENICITY, MUTAGENICITY, SYNERGISTIC PRODUCTS, REPRODUCTIVE TOXICITY, ANY MEDICAL CONDITIONS GENERALLY RECOGNIZED BEING AGGRAVATED BY EXPOSURE WERE EXAMINED, NO INFORMATION WAS FOUND OR IS AVAILABLE.

EMERGENCY AND FIRST AID PROCEDURES

EYES.....: IMMEDIATELY FLUSH WITH A LARGE AMOUNT OF W FOR AT LEAST 15 MINUTES, LIFTING UPPER AND LOWER LIDS INTERMITTENTLY. SEE AN OPTHALMOLOGIST.

SKIN.....: WASH WITH LARGE AMOUNTS OF WATER. IF IRRIT TION PERSISTS, OBTAIN MEDICAL ATTENTION.

INHALATION.....: REMOVE TO FRESH AIR. CALL A PHYSICIAN.

INGESTION.....: IF SWALLOWED, DRINK PLENTY OF WATER IMMEDIA TO DILUTE. DO NOT INDUCE VOMITING. SEEK A PHYSICIAN.

DECONTAMINATION PROCEDURE: WASH AREA WITH LARGE AMOUNTS OF WATER.

J. T. BAKER CHEMICAL CO. 222 RED SCHOOL LANE, PHILLIPSBURG, NJ 08865

MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY TELEPHONE -- (201) 859-2151

CHEMTREC # (800) 424-9300 -- NATIONAL RESPONSE CENTER # (800) 424-8802

SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME	TRICHLOROETHYLENE (AIR ONLY)
HAZARD CLASS	ORM-A
UN/NA	UN1710
LABELS	NONE
REPORTABLE QUANTITY	1000 LBS.

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME	TRICHLOROETHYLENE
HAZARD CLASS	6.1
UN/NA	UN1710
LABELS	HARMFUL - STOW AWAY FROM FOOD STUFFS

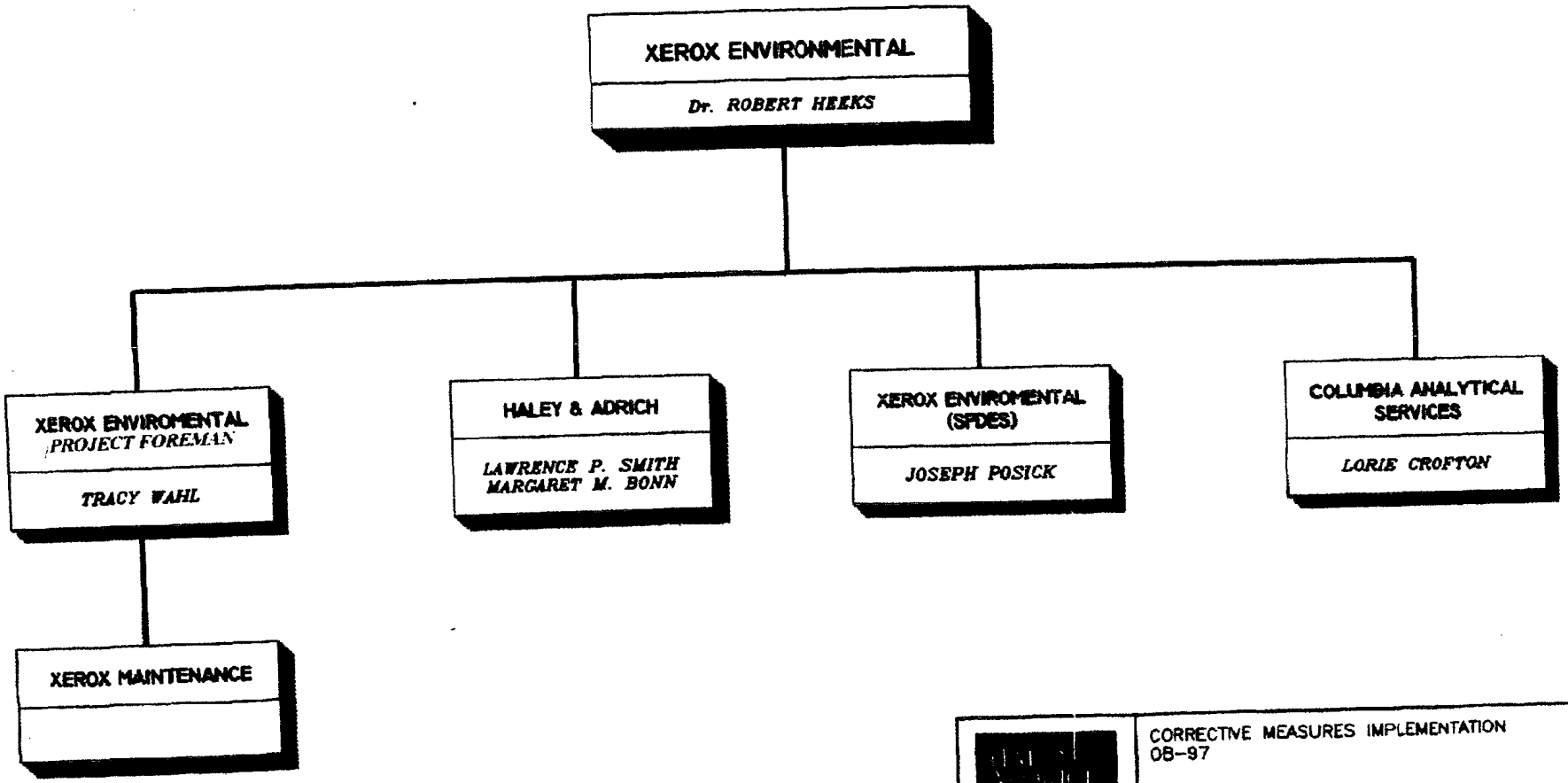
(TM) AND (R) DESIGNATE TRADEMARKS.
N/A = NOT APPLICABLE OR NOT AVAILABLE

1 INFORMATION PUBLISHED IN THIS MATERIAL SAFETY DATA SHEET HAS BEEN COMPI
FROM OUR EXPERIENCE AND DATA PRESENTED IN VARIOUS TECHNICAL PUBLICATIONS. I
THE USER'S RESPONSIBILITY TO DETERMINE THE SUITABILITY OF THIS INFORMATION
THE ADOPTION OF NECESSARY SAFETY PRECAUTIONS. WE RESERVE THE RIGHT TO REVI
MATERIAL SAFETY DATA SHEETS PERIODICALLY AS NEW INFORMATION BECOMES AVAILA

-- LAST PAGE --

FILE No. 7580-072

PROJECT ORGANIZATION



UNDERGROUND ENGINEERING & ENVIRONMENTAL SOLUTIONS

CORRECTIVE MEASURES IMPLEMENTATION
08-97

PROGRAM MANAGEMENT PLAN

SCALE: NONE

AUGUST 1996

FILENAME: 7860-072:ORG.DWG

FIGURE 1

THE DOCUMENT COMPANY

XEROX

Ms. Denise Radtke
Engineering Geologist 2
New York State Dept. of Environmental Conservation
Division of Solid and Hazardous Materials
50 Wolf Road
Albany, New York 12233-7252

Re: Financial Assurance Documentation for the 1995 Reporting Year

Dear Ms. Radtke:

Enclosed please find a copy of this year's financial assurance submittal which demonstrates liability coverage and financial assurance of closure and post-closure care for the Xerox Corporation facility(the Joseph C. Wilson Center for Technology) located at 800 Phillips Road, Webster, New York 14580
(EPA ID#: NYD002211324). The current closure/post-closure cost estimate for the Joseph C. Wilson Center for Technology provided in the attached documentation includes the costs associated with correction of the OB-97 investigation area.

If you have any questions, please do not hesitate to contact me at (716) 422-6886.

Sincerely,

Karen L. Whalen

Encl.

c: Joseph Stulb, Operations Mgr., Environmental Engineering
Dr. Robert Heeks, Project Manager, Xerox Corporation

Xerox Corporation
Environmental Engineering
800 Phillips Road, Bldg. 0304-13S
Webster, NY 14580