
PELHAM BAY LANDFILL
BRONX, NEW YORK
**OPERATION MAINTENANCE &
MONITORING MANUAL**
VOLUME I

Revised January 2005



NYC Department of Environmental Protection
59-17 Junction Boulevard
Flushing, New York 11373-5108

Originally Prepared By:

Woodward-Clyde 

Woodward-Clyde Consultants, Inc
363 Seventh Avenue, 11th Floor
New York, New York 10001

PELHAM BAY LANDFILL

**OPERATION MAINTENANCE &
MONITORING MANUAL**

VOLUME I

PELHAM BAY LANDFILL

OPERATION MAINTENANCE & MONITORING MANUAL

VOLUME I

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1-1
1.1 PURPOSE OF MANUAL	1-1
1.2 ORGANIZATION OF THE OM&M MANUAL	1-2
1.3 SITE DESCRIPTION	1-4
1.4 LEGAL CONTEXT	1-4
1.5 ADDITIONAL PROJECT COMPONENTS	1-5
 2.0 DESCRIPTION OF LANDFILL CLOSURE SYSTEMS	 2-1
2.1 GENERAL	2-1
2.2 LANDFILL COVER SYSTEM	2-1
2.3 STORMWATER MANAGEMENT SYSTEM	2-3
2.4 GROUNDWATER/LEACHATE MANAGEMENT SYSTEM	2-4
2.4.1 Groundwater Management System	2-5
2.4.1.1 Cutoff Wall	2-5
2.4.1.2 Groundwater Collection Drain	2-6
2.4.1.3 Groundwater Monitoring Wells	2-6
2.4.2 Leachate Collection and Disposal System	2-6
2.4.2.1 Downgradient Collector Drain and Sump	2-7
2.4.2.2 Curtain Drain	2-9
2.4.2.3 Lift Stations 1 and 2	2-9
2.4.2.4 Decontamination Trailer	2-10
2.4.2.5 Gravel Decon Pad Containment Sump	2-11
2.4.2.6 Leachate Storage Tanks	2-11
2.4.2.7 Leachate Storage Tanks Containment Sump	2-12
2.4.2.8 Contract HP-877 Force Main	2-12
2.4.2.9 Central Control Alarm and Motor Control Center	2-13
 2.5 LANDFILL GAS MANAGEMENT SYSTEM	 2-13
2.5.1 Landfill Gas Collection	2-13
2.5.2 Blower and Flare System Operation	2-15
2.5.3 Electrical System	2-17
2.5.3.1 Power "Panel G"	2-17
2.5.3.2 Power "Panel G-1"	2-17

2.6	ANCILLARY SYSTEMS	2-17
2.6.1	Access Roads	2-18
2.6.2	Fencing	2-18
2.7	ENVIRONMENTAL COMPLIANCE	2-19
2.7.1	Elements of Monitoring Plan	2-19
3.0	PERSONNEL	3-1
3.1	ORGANIZATION	3-1
3.2	STAFFING REQUIREMENTS	3-1
3.3	RESPONSIBILITIES AND DUTIES	3-3
3.4	QUALIFICATIONS	3-5
3.5	TRAINING	3-5
4.0	SAFETY POLICIES AND PROCEDURES	4-1
4.1	OVERVIEW	4-1
4.2	FIELD PROGRAM ORGANIZATION	4-1
4.2.1	OM&M Project Manager	4-2
4.2.2	OM&M Project Health and Safety Officer	4-3
4.2.3	OM&M Site Safety Officer	4-4
4.2.4	Other Personnel	4-5
4.3	REGULATORY REQUIREMENTS	4-5
4.4	GENERAL SAFETY RULES	4-7
4.5	SAFETY STANDARDS	4-9
4.5.1	Hot Work	4-9
4.5.2	Lockout/Tagout	4-12
4.5.3	Confined Space Entry	4-15
4.6	ELECTRICAL SAFETY	4-19
4.7	EMERGENCY PROCEDURES	4-20
4.7.1	General	4-20
4.7.2	Training Requirements	4-21
4.7.3	Site Communications	4-21
4.8	COMPRESSED GAS CYLINDERS	4-22
4.8.1	General Safety Procedures	4-22

4.8.2	Storage of Cylinders	4-22
4.9	INDUSTRIAL HYGIENE PROCEDURES	4-23
4.10	HAZARD COMMUNICATION POLICY	4-24
4.10.1	General Company Policy	4-24
4.10.2	Material Safety Data Sheets and Chemical Hazard Information	4-24
4.10.3	Labels and Other Forms of Warning	4-24
4.10.4	Training	4-25
4.10.5	Protective Measures	4-26
4.11	INCIDENT/ACCIDENT INVESTIGATION PROCEDURE	4-26
4.12	SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP)	4-27
5.0	DOCUMENTATION AND REPORTING	5-1
5.1	FIELD NOTEBOOK	5-1
5.2	CHECKLISTS	5-2
5.3	LABORATORY RECORDS	5-2
5.4	PHOTOGRAPHS	5-2
5.5	MAPS AND DRAWINGS	5-3
5.6	REPAIR LOGS	5-3
5.7	REPORTING REQUIREMENTS	5-3
6.0	EMERGENCIES AND CONTINGENCY PLAN	6-1
6.1	GENERAL	6-1
6.1.1	Emergencies	6-1
6.1.2	Contingencies	6-1
6.2	CORRECTIVE ACTION PROCESS	6-2
6.3	CONTINGENCY PROCEDURES	6-3
6.3.1	Gas System Shutdown	6-3
6.3.2	Leachate Tank Overflow	6-4
6.3.3	Excessive Settlement of Cap	6-5
6.3.4	Sideslope Failure	6-5
6.3.5	Stormwater System Failure	6-5
6.3.6	Seepage from Sideslopes	6-6
6.3.7	High Leachate Levels Along Cutoff Wall	6-7
6.3.8	Broken Force Main	6-7
6.3.9	Power Failure for an Extended Period of Time	6-8

6.4	EMERGENCY CONTACTS	6-8
6.5	DIRECTIONS TO THE JACOBI MEDICAL CENTER	6-8
7.0	REPORTS	7-1
7.1	REPORT FORMATS	7-1
7.1.1	Monthly Reports	7-1
7.1.2	Annual Reports	7-3
7.1.3	Five-Year Reports	7-3
8.0	CITIZEN PARTICIPATION AND PUBLIC OUTREACH PLAN	8-1
8.1	PREFACE	8-1
8.2	HISTORY	8-1
8.3	SITE INFORMATION	8-1
8.3.1	Site Setting	8-1
8.3.2	History	8-2
8.4	COMMUNITY RELATIONS PROGRAM	8-2
8.4.1	Objectives/Tasks	8-2
8.4.2	Issues and Concerns	8-3
8.4.3	Public Health	8-3
8.4.4	Environmental Impacts	8-4
8.4.5	Credibility/Validity of Testing	8-4
8.4.6	Schedule	8-4
8.4.7	Community and Agency Coordination	8-4
8.5	PROGRAM ACTIVITIES	8-4
8.5.1	Advisory Committees	8-4
8.5.2	Public Meetings	8-5
8.5.3	Information Dissemination	8-5
8.5.4	Public Information Materials	8-6
8.5.5	Public Notifications and Medial Relations	8-6
8.5.6	Project Repositories	8-6
8.5.7	Mailing List	8-7
8.6	PROGRAM ADMINISTRATION AND DOCUMENTATION	8-7

8.7 COMMUNITY PARTICIPATION DURING OM&M	8-7
8.8 CURRENT PROJECT CONTACTS	
8.8.1 New York City Department of Environmental Protection	8-8
8.8.2 New York City Law Department	8-8
8.8.3 New York City Department of Parks and Recreation	8-8
8.8.4 NYS Department of Environmental Conservation	8-9
8.8.5 Community Contacts	8-9
8.8.6 Contractor	8-10
8.9 FREEDOM OF INFORMATION LAW (FOIL) PACKET	
8.9.1 Freedom of Information Law "FOIL" requests	8-10
8.9.2 Freedom of Information Procedures	8-10
9.0 SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP)	9-1

LIST OF FIGURES

1-1	SITE LOCATION PLAN
2-1	LANDFILL CAP CONSTRUCTION
2-2	HDPE GEOMEMBRANE PLAN
2-3	STORMWATER MANAGEMENT SYSTEM
2-4	GROUNDWATER MANAGEMENT SYSTEM
2-5	TYPICAL SECTION THROUGH CUTOFF WALL
2-6	LEACHATE COLLECTION SYSTEM
2-7	SCHEMATIC DIAGRAM LEACHATE COLLECTION SYSTEM
2-8	LEACHATE STORAGE TANK AREA SCHEMATIC
2-9	LEACHATE DISCHARGE TO SEWER SCHEMATIC
2-10	GAS COLLECTION AND FLARING SYSTEM
2-11	LANDFILL GAS COLLECTION SYSTEM SCHEMATIC
2-12	ENVIRONMENTAL MONITORING LOCATIONS

6-1 ROUTE TO JACOBI MEDICAL CENTER

LIST OF TABLES

TABLE 2-1 GROUNDWATER MONITORING WELLS AND PIEZOMETERS

TABLE 6-1 EMERGENCY CONTACTS AND TELEPHONE NUMBERS

LIST OF APPENDICES

APPENDIX A MONITORING WELL/PIEZOMETER CONSTRUCTION LOGS

PELHAM BAY LANDFILL OPERATION MAINTENANCE & MONITORING MANUAL VOLUME II

TABLE OF CONTENTS

Material

Attachment

A. GEOSYNTHETICS

GEOGRID
GEOTEXTILE
GEOCOMPOSITE

B. SOIL AND GRAVEL MATERIALS

CRUSHED STONE BASE
CRUSHED AGGREGATE BASE COURSE
RIP RAP BEDDING MATERIAL
RIP RAP - CLASS I
3 IN MINUS BARRIER PROTECTION MATERIAL
INFILTRATION DRAINAGE TRENCH
STRUCTURAL BACKFILL
TRENCH BACKFILL
PIPE AND MANHOLE BEDDING
TOPSOIL

C. SEEDING AND FERTILIZER

D. CENTRIFUGAL BLOWERS

E. PUMPS

F. ENCLOSED FLARE

FLEXIBLE HOSE-GAS EXTRACTION WELL
TEST PORT - GAS WELLHEADS
PROPANE AND NITROGEN CYLINDERS
GAS CYLINDER REGULATOR VALVES
TEMPERATURE GAUGES
PRESSURE AND VACUUM GAUGES
GAS FLOW METER
SAMPLING EQUIPMENT
GAS EXTRACTION WELL - 1 1/2 IN CRUSHED STONE
PAINT SPECS FOR FLARE ASSEMBLY

PELHAM BAY LANDFILL OPERATION MAINTENANCE & MONITORING MANUAL VOLUME II

TABLE OF CONTENTS (continued)

Material

Attachment

G. PVC PIPES AND FITTINGS

GAS EXTRACTION WELLS - PVC PIPE, FITTINGS, AND VALVES
PVC SLOTTED PIPE - GAS EXTRACTION WELL

H. POLYETHYLENE PIPES AND FITTINGS

HDPE COLLECTION PIPE (LEACHATE COLLECTION)
HDPE COLLECTION PIPE - JOINT DETAIL (LEACHATE COLLECTION)
HDPE GAS PIPE AND FITTINGS
4 IN CORRUGATED HDPE PIPE & FITTINGS
STEEL CASING (CARRIER PIPE) FOR HDPE GAS PIPE UNDER ROAD
HDPE PIPE ANCHORS
30 IN SMOOTH HDPE SEDIMENTATION BASIN CONNECTION PIPING

I. DUCTILE IRON PIPES AND FITTINGS

DUCTILE IRON PIPING
3 IN MJ PIPE SLEEVE #344 (FLEX. PIPE CONN)
FLANGE BOLTS AND GASKETS

J. STAINLESS STEEL PIPING AND FITTINGS

STAINLESS STEEL PIPES
GASKETS FOR STAINLESS STEEL PIPES

K. VALVES AND APPURTENANCES

4 IN, 6 IN, 8 IN PVC BUTTERFLY VALVES
4 IN, 6 IN, 8 IN STAINLESS STEEL BACK UP RINGS
BUTTERFLY VALVE FOR GAS VENTILATION
SWING CHECK VALVES
6 IN DIAMETER FLAP VALVE
GAS EXTRACTION VALVE BOX
CHECK VALVE
WEDGE VALVES
3 IN FLANGE GATE VALVE

PELHAM BAY LANDFILL OPERATION MAINTENANCE & MONITORING MANUAL VOLUME II

TABLE OF CONTENTS (continued)

Material

Attachment

3 IN FLANGE CHECK VALVE
VALVE BOX - LEACHATE COLLECTION SYSTEM
VALVE CHAMBER
24 IN DIAMETER FLAP VALVE

L. INSTRUMENTS

INSTRUMENTATION AND CONTROL FOR GAS CONTROL UNIT

M. ELECTRICAL COMPONENTS

RIGID GALVANIZED CONDUIT
PVC GALVANIZED CONDUIT
CABLE RACK FOR MANHOLE
ELECTRICAL PULLBOXES
WIRES AND CABLES
ELECTRICAL HANDHOLE
CAST IRON COVER FOR ELECTRICAL HANDHOLE
UNDERGROUND DUCT BANK - CONDUIT AND WIRE
DRY TYPE TRANSFORMER
PANELBOARD, TRANSFORMER AND SWITCHES
400 WATT FLOOD LAMPS

N. MISCELLANEOUS EQUIPMENT

GROUNDWATER MANAGEMENT SYSTEM
MONITORING WELLS
GROUNDWATER SAMPLING EQUIPMENT
EXTRACTION WELL DRILLING EQUIPMENT
SUBMISSION FOR PIEZOMETERS
WELL ABANDONMENT
BENTONITE PELLET SEALS
MANHOLES AND APPURTENANCES
CP MANHOLES - FRAMES AND GRATES
MANHOLE STEPS
MANHOLE PIPE CONNECTOR FOR SANITARY SYSTEMS
PRECAST MANHOLE EXTENSION
MANHOLE WATERPROOFING
STORMWATER MANAGEMENT SYSTEM

PELHAM BAY LANDFILL OPERATION MAINTENANCE & MONITORING MANUAL VOLUME II

TABLE OF CONTENTS (continued)

Material

Attachment

72 IN SEWER ROOF SLAB
RECONSTRUCTION OF EXISTING 30 IN AND 72 IN SEWERS
NEOPRENE BOOT CONNECTION - INFILTRATION DRAINAGE TRENCH
BAFFLED OUTLETS
RICHMOND DOWEL BAR SPLICER
SUPPLEMENTAL INFORMATION
SLURRY MIXING PLANT - DESIGN MIX REPORT
SLURRY WALL CONSTRUCTION - SLURRY TRENCH SOIL SEALING
GRADE

PELHAM BAY LANDFILL OPERATION MAINTENANCE & MONITORING MANUAL VOLUME II

TABLE OF CONTENTS (continued)

Material

Attachment

ADDITIONAL DOCUMENTS

LAMSON CENTRIFUGAL LFG BLOWERS & CONTROLS (SUBMITTAL PACKAGE)

AER-X-DUST CORPORATION
PO BOX 93
TENNENT, NEW JERSEY 07763

OPERATION AND MAINTENANCE MANUAL FOR FLYGT SUBMERSIBLE

EXPLOSION PROOF PUMPS
G.A. FLEET ASSOCIATES, INC.
55 CALVERT STREET
BOX 616
HARRISON, NEW YORK 10528

TENSAR DRAINAGE COMPOSITE (TECHNICAL SUBMISSION)

TENSAR ENVIRONMENTAL SYSTEMS, INC.
5775-B GLENRIDGE DRIVE
LAKESIDE CENTER, SUITE 450
ATLANTA, GEORGIA 30382-5363

GUNDLE STANDARDS MANUAL MATERIALS AND INSTALLATION

GUNDLE LINING SYSTEMS INC.
19103 GUNDLE ROAD
HOUSTON, TEXAS 77073-3598

OPERATING MANUAL FOR 7 ft BY 40 ft ZTOF ENCLOSED GROUND FLARE

SYSTEM
JOHN ZINK COMPANY
11920 EAST APACHE
TULSA, OKLAHOMA 74116

HEALTH, SAFETY & SPILL RESPONSE PLAN: FOR THE CONSTRUCTION OF A SLURRY WALL AND LEACHATE CONTROL SYSTEM AT THE PELHAM BAY LANDFILL

ERM - NORTHWEST
175 FROEHLICH FARM BOULEVARD
WOODBURY, NEW YORK 11797

ADDITIONAL DOCUMENTS (continued)

PELHAM BAY LANDFILL OPERATION MAINTENANCE & MONITORING MANUAL VOLUME II

TABLE OF CONTENTS (continued)

Material

Attachment

QUALITY CONTROL PLAN FOR PELHAM BAY LANDFILL CLOSURE
BRECO MECHANICAL GROUP, INC.
201 SAW MILL RIVER ROAD
YONKERS, NEW YORK 10701

**PELHAM BAY LANDFILL
OPERATION MAINTENANCE & MONITORING MANUAL
VOLUME III**

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1-1
2.0 LANDFILL COVER SYSTEM	2-1
2.1 GENERAL	2-1
2.2 MAJOR SUBSYSTEMS AND COMPONENTS	2-1
2.3 MONITORING, INSPECTION, AND MAINTENANCE	2-2
2.3.1 Cover Inspection	2-3
2.3.2 Grass Cover/Topsoil Layer	2-3
2.3.3 Cover Soil and Cap Components	2-5
2.3.4 Cap Repair Protocol	2-6
2.3.4.1 Surface Cracks	2-6
2.3.4.2 Vegetative Growth	2-6
2.3.4.3 Vector Penetration	2-7
2.3.4.4 Settlement	2-7
2.3.4.5 Erosion	2-8
2.3.4.6 Slope Stability	2-9
2.3.4.7 Seepage	2-9
2.3.4.8 Vandalism	2-10
3.0 STORMWATER MANAGEMENT SYSTEM	3-1
3.1 GENERAL	3-1
3.2 MAJOR SUBSYSTEMS AND COMPONENTS	3-1
3.3 MONITORING, INSPECTION, AND MAINTENANCE	3-2
3.3.1 General	3-2
3.3.2 Stormwater Drainage Ditches	3-3
3.3.2.1 Ditches	3-3
3.3.2.2 Infiltration Drainage Trenches	3-4
3.3.2.3 Culverts	3-5
3.3.3 Manholes and HDPE Pipes	3-5
3.3.4 Concrete Baffled Outlets	3-7
3.3.5 Riprap	3-8
3.3.6 Sedimentation Ponds	3-8
3.3.7 Inlet/Outlet Structures	3-9

**PELHAM BAY LANDFILL
OPERATION MONITORING & MAINTENANCE MANUAL
VOLUME III**

TABLE OF CONTENTS (continued)

<u>Section</u>	<u>Page</u>
4.0 GROUNDWATER/LEACHATE MANAGEMENT SYSTEM	4-1
4.1 GENERAL	4-1
4.2 MAJOR SUBSYSTEMS AND COMPONENTS	4-1
4.2.1 Downgradient Collection Drains	4-2
4.2.2 Collection Sumps (D-1, D-8, D-10)	4-3
4.2.3 Curtain Drain	4-6
4.2.4 Lift Stations Nos. 1 and 2	4-8
4.2.5 Force Main Heat Tracing	4-10
4.2.6 Decontamination Trailer Sump	4-12
4.2.7 Gravel Decon Pad Area Sump	4-13
4.2.8 Leachate Storage Tanks	4-15
4.2.9 Leachate Storage Tank Containment Area Sump	4-18
4.2.10 Carbon Adsorption System (Storage Tank Off Gas)	4-19
4.2.11 Forcemain Discharge to POTW	4-22
4.2.12 Storage Tank Off-Loading and Tanker Loading	4-23
4.2.13 Central Control Alarm Panel	4-26
4.2.14 Motor Control Center	4-27
4.2.15 Cut-Off Wall and Collector Drain	4-28
4.3 MONITORING, INSPECTION AND MAINTENANCE	4-29
4.4 TROUBLESHOOTING PROCEDURES	4-29
4.5 SPARE PARTS	4-29
5.0 LANDFILL GAS MANAGEMENT	5-1
5.1 GENERAL	5-1
5.2 EQUIPMENT AND COMPONENTS	5-1
5.2.1 Gas Collection System	5-2
5.2.2 Condensate System	5-7
5.2.3 Enclosed Flare System	5-8
5.2.4 Electrical System	5-15
5.2.4.1 Power "Panel G"	5-15
5.2.4.2 Power "Panel G-1"	5-17
5.2.4.3 15KVA Transformer	5-18

**PELHAM BAY LANDFILL
OPERATION MONITORING & MAINTENANCE MANUAL
VOLUME III**

TABLE OF CONTENTS (continued)

<u>Section</u>	<u>Page</u>
5.2.4.4 Disconnect Switches	5-19
5.3 MONITORING, INSPECTION, AND MAINTENANCE	5-20
5.4 SAMPLING AND ANALYSIS	5-20
5.4.1 Gas Collection System	5-20
5.4.1.1 Instrumentation	5-20
5.4.1.2 Total Vacuum Pressure Measurement	5-21
5.4.1.3 Methane Concentration Measurement	5-22
5.4.2 Condensate System	5-22
5.4.3 Gas Flaring System	5-23
5.4.4 Additional Sampling and Analysis Requirements	5-23
5.5 TROUBLESHOOTING PROCEDURES	5-23
5.5.1 Gas Collection System and Well System	5-23
5.5.2 Condensate System	5-24
5.5.3 Gas Flaring System	5-25
5.5.4 Electrical System	5-26
5.6 SPARE PARTS	5-27
6.0 ENVIRONMENTAL MONITORING AND TESTING	6-1
6.1 MONITORING PLAN	6-1
6.1.1 Elements of Monitoring Plan	6-1
6.1.2 Program Review	6-2
6.1.3 Well Sampling Equipment	6-2
6.2 ENVIRONMENTAL MONITORING	6-2
6.2.1 Sampling Schedule	6-3
6.2.2 Effectiveness of Remedial Measures	6-6
6.2.3 Sampling Procedures	6-6
6.2.4 Analytical Program	6-6
6.2.4.1 Analytical Schedules and Methods	6-6
6.2.4.2 Laboratory QC Samples	6-7

**PELHAM BAY LANDFILL
OPERATION MONITORING & MAINTENANCE MANUAL
VOLUME III**

TABLE OF CONTENTS (continued)

<u>Section</u>	<u>Page</u>
6.2.4.3 Reporting and Deliverables	6-7
6.2.4.4 Special Analytical Protocols	6-7
6.2.4.5 Laboratory Audit	6-8
6.2.4.6 Data Audit	6-9
6.2.5 Evaluation of Monitoring Results	6-9
6.3 RECORDS	6-9
6.4 SUPPORTING DOCUMENT	6-10
7.0 ANCILLARY SYSTEMS	7-1
7.1 GENERAL	7-1
7.2 MAJOR SUBSYSTEMS AND COMPONENTS	7-1
7.3 MONITORING, INSPECTION AND MAINTENANCE	7-1
7.4 EXPECTED ROUTINE MAINTENANCE ITEMS	7-2

LIST OF TABLES

<u>TABLE NO.</u>	<u>TITLE</u>
4-1	LEACHATE COLLECTION SYSTEM TROUBLESHOOTING GUIDE
4-2	SPARE PART LIST FOR GROUNDWATER/LEACHATE MANAGEMENT SYSTEM
5-1	LANDFILL GAS SYSTEM WELL TROUBLESHOOTING CHECKLIST
5-2	SPARE PARTS FOR GAS BLOWERS
5-3	SPARE PARTS FOR GAS FLARE
6-1	MONITORING WELLS AND POINTS
6-2	ANALYTICAL SCHEDULE

**PELHAM BAY LANDFILL
OPERATION MONITORING & MAINTENANCE MANUAL
VOLUME III**

TABLE OF CONTENTS (continued)

<u>Section</u>		<u>Page</u>
6-3	REPORTED MONITORING WELL GROUNDWATER CONCENTRATIONS	

**PELHAM BAY LANDFILL
OPERATION MONITORING & MAINTENANCE MANUAL
VOLUME III**

TABLE OF CONTENTS (continued)

<u>Section</u>	<u>Page</u>
----------------	-------------

LIST OF FIGURES

<u>FIGURE NO.</u>	<u>TITLE</u>
2-1	COVER SYSTEM INSPECTION ZONE LOCATION PLAN
4-1	SCHEMATIC DIAGRAM LEACHATE COLLECTION SYSTEM
5-1	GAS BLOWERS AND ENCLOSED FLARE FLOW AND INSTRUMENTATION DIAGRAM
5-2	GAS COLLECTION AND FLARING SYSTEM
6-1	ENVIRONMENTAL MONITORING LOCATIONS

LIST OF APPENDICES

<u>APPENDIX NO.</u>	<u>TITLE</u>
A	SITE INSPECTION CHECKLIST SHEETS
B	TASKS FOR OPERATION AND MAINTENANCE
C	LONG TERM MONITORING PROGRAM
D	GROUNDWATER SAMPLE COLLECTION PROTOCOL USING BAILERS
E	GROUNDWATER SAMPLE COLLECTION PROTOCOL USING LOW FLOW RATE PURGING AND SAMPLING TECHNIQUE
F	SURFACE RUN-OFF WATER SAMPLE COLLECTION PROTOCOL
G	GROUNDWATER TABLE MEASUREMENT PROTOCOL

**PELHAM BAY LANDFILL
OPERATION MONITORING & MAINTENANCE MANUAL
VOLUME III**

TABLE OF CONTENTS (continued)

<u>Section</u>		<u>Page</u>
H	TARGET COMPOUND LISTS (TCLS) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)	
I	SAMPLING LOG SHEETS	
	- GROUNDWATER ELEVATION SUMMARY	
	- SAMPLING EVENT SUMMARY	
	- GROUNDWATER ELEVATION	
	- QUARTERLY SAMPLING/GROUNDWATER	

1.1 PURPOSE OF MANUAL

The purpose of this Operation Maintenance and Monitoring (OM&M) Manual is to provide guidance to the OM&M Contractor in carrying out the post-closure activities at Pelham Bay Landfill. The landfill closure and remedial facilities were installed during performance of earlier contracts with New York City Department of Environmental Protection (NYCDEP).

The OM&M Manual specifies basic periodic inspection and maintenance of these remedial facilities, sets general safety and operational standards, provides sampling and analyses protocols, and establishes responses for potential emergency situations. Specifically the OM&M Manual:

1. Familiarizes the OM&M Contractor with various components of the Pelham Bay Landfill closure including:
 - Landfill cover system;
 - Stormwater management system;
 - Groundwater/leachate management system;
 - Landfill gas management system;
 - Ancillary Systems (i.e., access roads, fencing, signage, etc.); and,
 - Environmental monitoring protocols
2. Provides the OM&M Contractor with Safety, Emergency and Contingency guidelines.
3. Provides a detailed description of the site systems so that the OM&M Contractor may better understand the detailed operating instructions.
4. Specifies detailed instructions regarding inspection, operation and maintenance of appropriate components of the various systems.

5. Specifies environmental monitoring and testing for groundwater, surface water, leachate and landfill gas.
6. Specifies responsibilities of the OM&M Contractor regarding reporting, and maintaining up-to-date, precise, and complete records.

1.2 ORGANIZATION OF THE OM&M MANUAL

1. This manual has been structured as three volumes. Record drawings and specifications for each of the five contracts and Standard Operating Procedure listed below in items 2 and 3, respectively, also form a part of this OM&M Manual by reference. These documents are an integral part of the OM&M Manual and should be consulted for additional operations and maintenance procedures and for materials and methods of construction when repair activities are undertaken. Access to the documents is available at the NYCDEP Trailer at the Site or by contacting Mr. Rupak Raha at (718) 595-6210. The three volumes are:
 - **Volume I** - This volume will be used to familiarize the OM&M Contractor, his/her personnel and subcontractors working at the Site with general information and requirements for post-closure care. In addition to describing components of the landfill closure systems, it also provides requirements for the OM&M Contractor including:
 - (i) Management organization, communications structure and required training;
 - (ii) Safety, emergency and contingency policies and procedures; and
 - (iii) Documentation and reporting
 - **Volumes IIa, IIb, and IIc** - This volume is bound into three subvolumes and contains shop drawings, manufacturers manuals and additional submissions provided with the equipment and materials installed under the listed contracts. It provides relevant information for the operation and/or maintenance of the equipment and materials.

Volume III - This volume contains standard operating procedures, inspection checklists, regular and preventative maintenance schedules, performance monitoring schedules, and environmental monitoring schedules (meeting regulatory requirements) for the closure and remediation systems installed at the Site. It provides the basic scope of work for the operation and maintenance contract at the Site including:

- (i) specific description of the components of each system;
 - (ii) description of normal and emergency operation procedures;
 - (iii) monitoring, inspection and maintenance schedules and procedures;
 - (iv) sampling and analysis procedures;
 - (v) troubleshooting procedures; and,
 - (vi) environmental monitoring
2. Record drawings and specifications for the following five contracts describe the remedial facilities installed for Pelham Bay Landfill and are attached to the OM&M Manual by reference:
- HP-867 "Leachate Control, Phase 1 - Structures and Equipment"
 - HP-868 "Leachate Control, Phase I - Electrical Work"
 - HP-875 "Slurry Wall and Leachate Control"
 - HP-876 "Geomembrane Capping and Gas Collection System"
 - HP-877 "Off-Site Force Main and Equipment Storage Building"
3. The Standard Operating Procedures (SOP) Manual prepared by Hazen and Sawyer (May 1993) provides information for operations and maintenance of the original Leachate Collection and Handling System installed under Contract HP-867 and is attached to the OM&M Manual by reference.

1.3 SITE DESCRIPTION

Pelham Bay Landfill (the Site) is located in the Bronx, a borough of New York City. The Site covers an approximate area of 87 acres and is bordered by the Hutchinson River to the north and east, the Eastchester Bay to the east and south, Pelham Bay Park to the southwest, and the Bruckner Boulevard Extension to the northwest. The New England Thruway (I-95) is less than one-half mile west of the Site. The Co-op City housing complex is located approximately one-half mile northwest of the Site. See Figure 1-1 for site location.

According to the Record of Decision (ROD) issued by the New York State Department of Environmental Conservation (NYSDEC) on August 31, 1993, the Site operated as a landfill from November 18, 1963 to December 31, 1978, and handled mainly the waste disposal needs of the Bronx. Wastes received at the landfill included mainly residential waste, rubbish, street dirt, construction waste and demolition waste. The mound, which was subsequently created, has a top elevation of approximately 130 feet above mean sea level (MSL); the bottom of the waste is at approximately 10 feet MSL. The volume of the landfill, including waste and cover soils, and assuming that no waste was placed below 10 feet MSL, was calculated to be approximately 8,130,000 cubic yards.

The site history and the physical characteristics of the landfill are described in detail in Sections 1.3 and 3.0, respectively of the Remedial Investigation Report, prepared in April 1993 (Woodward-Clyde Consultants, Inc., Reference 92C4087-8200).

1.4 LEGAL CONTEXT

During testimony on May 6, 1982, before a Senate Committee on Crime, a dispatcher for the Hudson Oil Refining Company indicated that waste oil sludges, metal plating wastes, lacquer, and solvents were illegally disposed of at several New York City landfills, including Pelham Bay Landfill. It was reported that volumes ranged from 11,000 gallons to 55,000 gallons per week in 1974. The testimony was never confirmed.

In 1983, the Pelham Bay Landfill was added to the New York State Registry of Inactive Hazardous Waste Sites as Class 3, meaning that it did not present a significant threat to public health and the environment. In 1987, its classification was changed to a Class 2 - "significant threat to public health and the environment", because the NYSDEC possessed information that hazardous waste was disposed of at the landfill.

In 1990, a lawsuit was filed by the New York Coastal Fisherman's Association against New York City for violations of the Federal Clean Water Act. As a result of this litigation, a Permanent Injunction was issued requiring the City to take measures to prevent leachate from entering Eastchester Bay. This resulted in the design and construction of a "150-day leachate collection system" consisting of five tanks each having 20,000 gallons storage capacity, five interceptor wells, a force main that conveys the discharge from the interceptor wells and a nearby sump to the storage tanks, and expansion of the existing French drain system and associated electrical systems. This work was performed under Contracts Number HP-867 and HP-868.

Under a separate contract (Contract Number HP-875), remedial activities on-site included the installation of a soil-bentonite cutoff wall (slurry wall) and two collector drains, one on either side of the cutoff wall. In addition, a portion of the above-ground leachate force main, installed under Contract No. HP-867, was dismantled and replaced with a below-grade force main. The existing leachate collection and handling system and other components of the remedial action are described in Section 1.5.

1.5 ADDITIONAL PROJECT COMPONENTS

The Site was further remediated under Contract Nos. HP-875, HP-876 and HP-877 in accordance with the ROD prepared by the NYSDEC, dated August 31, 1993. The ROD presented the remedial action for the Site in accordance with the New York State Environmental Conservation Law (ECL).

The major components of the remedial action are as follows:

- Regrading of the Site to provide proper site drainage and minimize erosion.
- Installation of an actively vented impermeable final cover, consistent with NYCRR Part 360 regulations for Solid Waste Management Facilities (effective date - December 31, 1988 and revised May 28, 1991), to minimize surface infiltration of precipitation and to collect gases generated by the wastes. The major elements of the cover include (top to bottom) a vegetated topsoil layer, a barrier (soil) protection layer, a drainage layer and a geomembrane.
- Installation of a stormwater collection system including drainage ditches, subdrains, conveyance piping, manholes, baffled outlets, inlet/outlet structures, sedimentation basins and outfalls.
- Installation and operation of a groundwater/leachate management system consisting of:
 1. Five temporary groundwater extraction wells and five storage tanks (referred to as the IRM/150 Day System) to control leachate from entering Eastchester Bay.
 2. A cutoff wall and an upgradient collector drain along the southwestern edge of the Site adjacent to Pelham Bay Park.
 3. A downgradient collector drain along the southwestern edge of the Site (on the landfill side of the cutoff wall).
- Installation of a geosynthetic gas-venting layer below the geomembrane on the top portion of the landfill. Onsite soils, placed nine inches thick, were used as the gas-venting layer on the side slopes.
- Installation and operation of an active gas collection system, which collects gases from the landfill and conveys them through piping to a flare station located at the base of the landfill.

- Limitation of use of the Site to reduce the risk of the remedial action being damaged or compromised.
- Construction of additional on-site groundwater extraction wells, in the future, if required.

Post-closure monitoring and sampling programs are also required by the ROD to evaluate the performance of the remedial action. Monitoring information gathered by the OM&M Contractor will be used by NYCDEP to evaluate the performance of the remedial action with respect to compliance with the technical requirements of the ROD. The monitoring frequency may be adjusted by the NYCDEP (with approval of the NYSDEC) based on testing results gathered from the first year of the program.

DESCRIPTION OF LANDFILL CLOSURE SYSTEMS

2.1 GENERAL

The major system components of the Pelham Bay Landfill Closure which require operation and maintenance include the following:

- Landfill cover system;
- Stormwater management system;
- Groundwater/leachate management system;
- Landfill gas management system;
- Ancillary systems (i.e., access roads, fencing, signage, etc.); and,
- Environmental monitoring system

Each of these systems is described in the following sections.

2.2 LANDFILL COVER SYSTEM

The landfill cover system is depicted in Figure 2-1, which shows a typical cap system constructed on the landfill sideslopes where a textured geomembrane is installed and a typical cap system constructed on top of the landfill where a smooth geomembrane is installed over horizontal gas collection trenches.

The landfill cover system is comprised of the following elements, starting from top to bottom:

- Vegetated topsoil layer (6-inch thick);
- Loamy soil, barrier protection layer (24-inch thick);
- Double sided geocomposite, drainage layer;
- HDPE geomembrane liner (60 mil thick);
- Gas venting layer; and,
- Subbase layer (9-inch thick).

The topsoil layer was constructed to support vegetative growth over the landfill surface and consists of a minimum 6-inch thick soil layer having a sandy loam texture. Specifications for the topsoil layer call for loamy soil free from undesirable material (i.e., refuse, hard clods, woody vegetation, etc.) and free from stones larger than two (2) inches.

Underlying the topsoil is a 24-inch thick protective soil barrier, which meets the classification of SP-SM, SM, SC or ML and having a specified maximum particle size of three (3) inches. This layer consists of on-site cover soil material and imported soil which meets the required classification and is free from undesirable material.

A geocomposite drainage layer underlies the loamy soil layer and consists of geotextiles, heat-bonded to both sides of a drainage geonet. The purpose of the geocomposite layer is to collect infiltration moisture and divert it to the infiltration drainage trenches where it is transported through a subdrain system to the stormwater sedimentation ponds (described in Section 2.3).

Underlying the geocomposite drainage layer is a geomembrane liner consisting of a 60-mil thick textured high-density polyethylene (HDPE) geomembrane on the side slopes of the landfill, and a 60-mil thick smooth HDPE geomembrane on the top portion of the landfill. The areal extent of these two HDPE materials is shown in Figure 2-2. The purpose of the geomembrane is to minimize rainfall infiltration into the landfill and landfill gas migration into the atmosphere.

A soil subbase layer was placed under the geomembrane to provide a smooth subgrade on which to place the geomembrane. The specified thickness of the subbase layer is nine (9) inches, and the soil consists of on-site cover soil material and imported soil free from debris, landfill waste and frozen material and having a maximum particle size of one (1) inch.

At the top portion of the landfill, a geosynthetic gas-venting layer was installed under the smooth HDPE geomembrane. The gas-venting layer is comprised of a single-sided geocomposite (which consists of a geotextile, heat-bonded to one side of a drainage geonet), crushed stone-filled trenches, and corrugated and perforated HDPE horizontal gas collection pipes. The layer is connected, via solid HDPE pipes, to the remainder of the active gas collection system, which includes a series of extraction wells, vent risers and a network of gas

collection pipes. On the sideslopes, the gas venting system consists of a 9-inch thick layer of on-site soils underlying the

geomembrane. The purpose of the gas venting layers is to collect the gases at the surface of the landfill and channel them to the active gas collection system. The gas collection system is capable to vent passively to the atmosphere only when the active gas venting system has been decommissioned or is temporarily not functioning (i.e., the gas blowers and/or flare are under repair). This is discussed in Section 2.5.

2.3 STORMWATER MANAGEMENT SYSTEM

The stormwater management system was designed:

- to remove stormwater runoff from the landfill surface during storm events in order to prevent ponding of water on the landfill;
- to provide sediment control prior to discharge to the bay;
- to control the effects of erosion on the landfill cap; and,
- to collect precipitation infiltrating through the barrier soil to the drainage system above the geomembrane liner.

The stormwater management system is shown on Figure 2-3.

During and after a storm event, runoff on the landfill surface is collected by stormwater drainage ditches located alongside the access roads. The ditches convey the runoff to stormwater collection manholes (SP-Series), which transfer the water to buried 24-inch diameter corrugated HDPE pipes. At the base of the landfill, the water in the HDPE pipes is discharged through concrete baffled outlets (BO-Series) used to dissipate energy, and is then conveyed, via perimeter drainage ditches, to one of three sedimentation ponds located at the base of the landfill. All three sedimentation ponds are hydraulically connected by below-ground 30-inch diameter HDPE pipes and sedimentation pond connection manholes (CP-Series). Finally, the stormwater is discharged from Pond C into Eastchester Bay through a 24-inch diameter Reinforced Concrete Pipe (RCP) and/or over the Pond C Spillway.

The stormwater management system on the landfill surface is designed to convey runoff from the 25 year-24 hour event (approximately 6 inches of rain in a 24 hour period) within the drainage ditches and stormwater collection piping. As designed, the access roads provide

some additional capacity for controlling stormwater since they slope gently towards the drainage ditches.

The sedimentation ponds serve a three-fold purpose:

- They lower the peak flow of the stormwater runoff prior to its discharge into Eastchester Bay;
- They allow suspended solids to settle out in the ponds prior to discharge to the extent possible given the limited space available on the site; and,
- They provide distinct monitoring points for sampling discharges into Eastchester Bay.

The sedimentation ponds are designed to contain runoff from 2.5 inches of rainfall in a 24 hour period. Runoff from storms greater than this will likely be partially directed into Eastchester Bay over the 60 ft wide spillway located on the north side of Sedimentation Pond C.

An infiltration drainage trench with 6-inch diameter corrugated HDPE piping (subdrain piping) is also part of the stormwater system. The drainage trenches collect water that has infiltrated down through the cap to the level of the geocomposite drainage layer. This layer is located just above the geomembrane liner. After migrating through the geocomposite to the infiltration trenches, the water is transported by subdrain piping to the stormwater collection manholes. Once there, it enters the remainder of the stormwater system and is transported to the sedimentation ponds.

Two portions of the subdrain system do not tie into the stormwater collection manholes. The first portion discharges via a transfer pipe to manhole MH-3A which empties into an existing storm sewer and discharges into Eastchester Bay. The second portion discharges directly to Eastchester Bay at the 6-inch diameter infiltration drainage pipe outfall located at the northern tip of the site (see Figure 2-3).

2.4 GROUNDWATER/LEACHATE MANAGEMENT SYSTEM

The groundwater/leachate management system is made up of several key elements that are discussed in this section. These include the groundwater management system and the leachate collection and disposal system. These systems work together to control and monitor groundwater contamination associated with the landfill.

2.4.1 Groundwater Management System

The groundwater management system includes a low-permeability vertical barrier cutoff wall and a collector drain located on the park side of the cutoff wall to control groundwater gradients.

2.4.1.1 Cutoff Wall

The cutoff wall consists of a soil-bentonite barrier installed at the southwestern and southern portions of the Site between the landfill and Pelham Bay Park (the Park). See Figure 2-4. The cutoff wall was constructed using slurry trench methods and was backfilled with a mixture of existing soils and bentonite that produced a low permeability backfill material.

The vertical barrier was designed:

- To maintain an inward hydraulic gradient at the Site (i.e., to keep the groundwater level on the Park side higher than the groundwater/leachate level on the landfill side by approximately one foot); and ,
- To minimize the amount of landfill gas migrating into the Park.

The cutoff wall, approximately 1,275 ft in length (see Figure 2-4), originates near the leachate storage tank area and extends in a south, southeasterly direction along the IRM access road at the southwestern portion of the landfill. The cutoff wall then turns in an easterly direction (still along the alignment of the IRM access road) and terminates across from Lift Station No. 2. The wall was installed to depths ranging from approximately 6 ft to 14 ft below ground surface, and terminates at the top of the underlying bedrock surface. The width of the cutoff wall is approximately 3 to 5 ft.

2.4.1.2 Groundwater Collection Drain

A groundwater collection drain was constructed on the Pelham Bay Park side of the cutoff wall. This “upgradient” drain extends in a parallel alignment to the southwestern portion of the cutoff wall. The upgradient drain was installed to intercept groundwater flowing from the Park towards the landfill and divert the flow via a buried 8-inch diameter HDPE pipe (slotted and solid) to an existing storm sewer which outlets directly into Eastchester Bay.

2.4.1.3 Groundwater Monitoring Wells

Nineteen (19) groundwater monitoring wells are used to measure groundwater elevations. Within the landfill proper there are fifteen (15) wells. Two (2) of the fifteen wells are combination groundwater/gas monitoring wells. These are located along the northwest boundary of the landfill. There are an additional four (4) wells outside the landfill in Pelham Bay Park. (See Figure 2-12).

In addition to the monitoring wells, six (6) cutoff wall piezometers were installed as part of the cutoff wall construction, three (3) on the landfill side and three (3) on the Park side. The piezometers, bottoming at a depth of approximately two (2) feet above the top of bedrock, were installed to monitor the groundwater and leachate levels on either side of the cutoff wall (upgradient and downgradient, respectively). They are monitored to confirm the design intent of maintaining an inward hydraulic gradient (i.e., keeping the groundwater level on the Park side approximately one (1) foot higher than the leachate levels on the landfill side).

Construction drawings for the monitoring wells are included in Appendix A. The locations of the monitoring wells and piezometers are shown in Figure 2-12. Table 2-1 lists the coordinate locations and installed depths of the monitoring wells and piezometers.

2.4.2 Leachate Collection and Disposal System

The leachate collection and disposal system was designed for the removal of leachate from the landfill in order to protect the groundwater from contamination and limit discharges into the surrounding environment, including Pelham Bay Park and Eastchester Bay. It is

comprised of a number of separate components (some now decommissioned) installed over the 10-year construction period of the landfill remediation.

The leachate collection and disposal system for the Site consists of the following components:

- Downgradient Collector Drain, Collection Manholes and Collection Sumps;
- Curtain drain;
- Lift Stations Nos. 1 and 2;
- Decon Trailer and Sump;
- Gravel Decon Pad Area and Sump;
- Leachate Storage Tanks and Containment Sump;
- Contract HP-877 Force Main Discharge to Hunt's Point Water Pollution Control Plant;

The plan locations of these components are shown in Figure 2-6. The inter-relation is illustrated schematically on Figure 2-7.

Originally, five leachate interceptor wells were installed along the southern portion of the Site to limit discharge of leachate to Eastchester Bay. Each well was designed to draw leachate from the landfill at a rate of about 10 gpm. Two of the five interceptor wells were decommissioned following installation of the cutoff wall and no longer require OM&M. The other three interceptor wells are not currently in operation and will be decommissioned after informing the pertinent authorities.

2.4.2.1 Downgradient Collector Drain and Sump

The downgradient collector drain consists of an 8-inch diameter slotted HDPE pipe embedded in sand and gravel. The gravel drain intercepts leachate migrating from the landfill and the pipe diverts the flow to one of the two lift stations located at either end of the drain. Flow intercepted north of Manhole D-6 drains northward, via Manholes D-5 through D-2, to Collection Sump D-1. Leachate is pumped from Collection Sump D-1, located at the north end of the collector drain to either Lift Station No. 1 or directly to the NYC Sewerage System. Leachate intercepted south of Manhole D-6 drains to Collection Sump D-8 from

which it is pumped to Collection Sump D-10. Leachate intercepted east of Manhole D-9 drains eastward to Collection Sump D-10 from which it is pumped to Lift Station No. 2.

Each of the Collection Sumps (D-1, D-8 and D-10) houses a pair of Flygt submersible pumps (6 total) operating in a duty/stand-by configuration. The specifications for the Flygt Submersible Pumps are as follows: the D-1 pump is a Model 3" CP3085, explosion-proof design, 4.0 HP, 460 volt, three phase, 60Hz, 3430 RPM, 252 impeller code, 114mm impeller diameter, FLS leakage detector with 40ft power cable. At The Best Efficiency Point (BEP) on a performance curve, the flow through these pumps is 145 US gpm, with a Head of 46.6ft, Power of 3.42 hp, Efficiency of 39.8% overall, and 48.7% when the Pump Efficiency is 100%, and the NPSH is 18ft. For pumps D-8 and D-10, the specifications include Model 3" CP3085, explosion-proof design, 3.0 HP, three phase, 20GPM @ 30 ft. TDH, 1800 RPM, 460V, 434 impeller code. The duty pump begins pumping when leachate rises to a designated level in the sump and activates a level switch. The stand-by pump is activated at a higher level.

For each pump there is a three position switch (AUTO-OFF-HAND) which controls operation of the pump. With this switch in AUTO, the electrode probe located in the collection sump controls the operation of the pump. In the HAND position the pump will run without reference to the level switches. Under normal operating conditions this switch should be in the AUTO position. Each pump can be set in either automatic or manual mode as indicated on the three position (AUTO-1-2) switch on the local pump control panel located beside each collection sump. In AUTO mode the duty pump and stand/by pump may be alternated at 8-hour intervals. (Note: this is 8 hours clock time rather than 8 hours run time). There is an electrode probe in each of the collection sumps (D-1, D-8 and D-10). Two settings control operation of the pump(s) while the third setting is used to detect an alarm condition (High water level). With the pair of pumps in AUTO mode, the control logic operates the pumps in the following sequence:

Switch	Action
HA	• Red alarm light is activated on the local panel
L2	• Start Duty Pump - Green pump run indicator light is activated
L1	• Stop Duty Pump

2.4.2.2 Curtain Drain

A curtain drain discharging by gravity to Lift Station No. 1 collects leachate from the west side of the landfill. The location of the curtain drain is shown on Figure 2-6. The curtain drain is made up of two segments. The shorter first segment extends about 200 ft in a northerly direction along the east side of Sedimentation Pond B. The second segment branches from the start of the first segment, goes about 300 feet in an east-northeast direction beneath the south portion of Pond B and then heads in a north-northeast direction for about 650 feet running parallel to Shore Road.. The curtain drain is composed of a buried slotted pipe surrounded by gravel and filter fabric. The slotted pipe transitions to a solid conveyance pipe at the junction of the two curtain drain segments. The solid conveyance pipe connects the curtain drain to Lift Station No. 1.

2.4.2.3 Lift Stations 1 and 2

Leachate collected in Lift Station No. 1 from the curtain drain is pumped to the five leachate storage tanks (See Figure 2-7).

Leachate from Lift Station No. 2, received from the Collection Sump D-10, is pumped to the leachate storage tanks through a 6-inch diameter ductile iron force main. Inside the IRM fenced-in complex (at the southwest corner of the site), the force main is located above ground and is protected by a heat-tracing system. Outside the fenced-in complex, the force main is installed below ground and follows the alignment of the downgradient collector drain (see typical Section, Figure 2-5).

Each of the Lift Stations (Nos. 1 and 2) houses a pair of Ebara submersible pumps operating in a duty/stand-by configuration. For Lift Station 1 the pumps are designated P-1A and P-1B. These pumps have 3 HP motors and deliver approximately 125gpm under normal operating conditions. The pumps in Lift Station 2 are designated P-2A and P-2B. They have 7.5 HP motors and deliver approximately 225gpm under normal operating conditions when discharging to the leachate storage tanks.

For each pump, there is a three-position switch (AUTO-OFF-HAND) that controls operation of the pump. With this switch in the AUTO position, the level switches located in the collection sump control the operation of the pump. In the HAND position the pump will run

without reference to the level switches. Under normal operating conditions this switch should be in the AUTO position.

Each pump can be set in either automatic or manual mode as indicated on the three position (AUTO-1-2) switch on the local pump control panel located beside each collection sump. In AUTO mode the duty pump and stand/by pump are alternated at 8 hour intervals. (Note: this is 8 hours clock time rather than 8 hours run time). Under normal operating conditions this switch should be in the AUTO position.

There are five level control switches in each of the lift stations. The lower three switches control operation of the pump(s) while the fourth switch is used to detect an alarm condition (High-High water level), and the fifth switch is a reference level. With the pair of pumps in AUTO mode the control logic operates the pumps in the following sequence:

Switch	Action
HA	• Red alarm light is activated on the local the panel
H2	• Starts Stand-by pump - Both pumps on; Green pump run indicator lights are activated on the local panel.
H1	• Start Duty Pump - Green pump run indicator light is activated on the local panel
L2	• Stop Duty Pump - Both pumps off
L1	• Reference Level

2.4.2.4 Decontamination Trailer

Drainage from the decontamination trailer is collected in a sump located on the south side of the trailer. A single, 1/2 HP, submersible pump rated at 15 gpm transfers the drainage from this sump to the decon pad/truck fill containment sump. The pump is controlled by a three-way selector switch (Hand-Off-Auto). In automatic mode, the pump will operate under control of a two position, pedestal mounted, float switch. In hand mode, the pump will operate continuously.

2.4.2.5 Gravel Decon Pad Containment Sump

The gravel decon pad containment sump is located outside the northwest corner of the leachate storage tank area. The gravel decon pad consists of a gravel filled, diked enclosure of approximately 100 ft by 110 ft, with a 80 mil polyethylene liner. The gravel decon pad sump contains five level switches and houses two submersible Ebara pumps, designated as P-4A and P-4B, which operate in duty/stand-by configuration. The pumps and level switches operate similar to the Ebara pumps described in Section 2.4.2.3. The pumps have 2 HP motors and each can transfer approximately 25 gpm to the leachate storage tanks.

2.4.2.6 Leachate Storage Tanks

The above-ground leachate storage tanks consist of five (5) reinforced fiberglass tanks, each with a capacity of approximately 20,000 gallons (diameter 11 ft, length 31 ft, mounted horizontally). Therefore, the total on-site leachate storage capacity is approximately 100,000 gallons. Leachate is pumped into the storage tanks through butterfly valves that connect to a common feed line to each tank inlet. An equalization line equipped with valves (typically open) permits the levels in all of the tanks to be equal under normal operating conditions. Each tank includes a heat tracing system and insulation.

Compressed air is used to aerate the leachate stored in the tanks in order to control anaerobic conditions and odor. The exhausted air from each storage tank is treated prior to atmospheric discharge in dedicated dual canister carbon filters (operated in parallel). The carbon filters are modular prefabricated canisters, containing ST series granular activated carbon and other essential components to achieve a continuous adsorption of odors, toxic vapors, irritants, and corrosive gases. The above ground leachate storage tank layout is shown on Figure 2-8.

Leachate from the storage tanks is currently pumped to the Hunts Point Water Pollution Control Plant. There is a capability to truck the leachate. The leachate may be pumped from the storage tanks by the use of two centrifugal horizontal hydrosolid pumps, each rated at 250 gpm with quantities monitored by the truckfill metering station. The metering station allows the operator to set the amount of leachate to be transferred, in gallons, to match the capacity of the tanker being filled. Trucking may occur during storm events to save sewer capacity. See Section 2.4.2.8 for additional information.

2.4.2.7 Leachate Storage Tanks Containment Sump

The containment area for the leachate storage tanks consists of a gravel filled, diked enclosure approximately 75 feet wide by 110 feet long lined with an 80 mil polyethylene geomembrane. A sump collects drainage from within this area. In addition, the sump can be used to transfer/redirect leachate from one tank to any of the other tanks for maintenance of the tanks.

The containment area sump contains five level switches and houses two submersible Ebara pumps, designated as P-3A and P-3B, which will operate in duty/stand-by configuration. The pumps and level switches operate similarly to the pumps described in Section 2.4.2.3. These pumps have 3 HP motors and each can transfer approximately 170 gpm to the leachate storage tanks.

2.4.2.8 Contract HP-877 Force Main

Under Contract HP-877 the leachate, collection system was connected to a NYC sewer manhole at Burr Avenue via an off-site force main. The off-site force main is operational, and leachate from the Site is pumped directly to the Burr Avenue manhole.

The on-site storage tanks are used to store leachate during rain events when direct pumping to Burr Avenue is not permitted. A high level sensor to be emplaced in the sewer system will detect storm events. Information collected by the sensor will be relayed back to the Pelham Bay Landfill Site.

The leachate disposal pipework for discharge to the sewer is shown in Figure 2-9. During a storm event, flow from Collection Sump D-1 will be automatically diverted to Lift Station No. 1 (V-4 opens and V-5 closes) from which it is pumped to the leachate storage tanks. Discharge from the storage tanks (to Collection Sump D-1) will be stopped (V-3 closes). In the event that the storage tanks fill before storm flows dissipating in the sewer system, a high level alarm will shut down the leachate collection system.

2.4.2.9 Central Control Alarm Panel and Motor Control Center

There is a central control alarm panel located in the Security Trailer at the entrance to the Site (See Figure 2-6). The alarm panel is equipped with the indicator lights, alarms, and associated circuitry to monitor the operation of the equipment in service for leachate collection and removal from the Site.

The motor control center for the Site is located west of the leachate storage tanks (See Figure 2-6). It provides power distribution to the motors for the mechanical equipment located throughout the Site. The motor control center protects the mechanical equipment from a power overload by the use of circuit breakers.

2.5 LANDFILL GAS MANAGEMENT SYSTEM

The landfill gas management system is made up of two main components that are discussed in this section. These include the landfill gas collection system and the blower/gas flare system. These combined systems work together to collect, monitor and control gas emissions associated with the landfill.

2.5.1 Landfill Gas Collection

Landfill gas generated within the landfill is collected through twenty-two (22) gas extraction wells, a gas venting layer at the surface of the landfill and a perimeter gas collection pipe around the base of the landfill. Extracted gas is conveyed via polyethylene piping to blowers and an enclosed flare system located at the southwestern base of the landfill. Gas piping is sloped continuously to a low point where condensate is removed in a gas/condensate separator. Collected condensate flows by gravity, via a 2-inch/4-inch double containment pipe to Manhole D-2 of the downgradient leachate collection drain system (see Figure 2-7). Figure 2-10 shows a plan view of the landfill with the gas collection system highlighted. The interrelations of the components of the gas system are shown schematically in Figure 2-11.

The landfill gas is discharged to the enclosed flare through two air blowers rated at 1500 cfm each. One air blower is in service at all times, while the other is in a stand-by mode.

Gas migration is monitored through three (3) monitoring wells located at the base of the northwest face of the landfill. These are shown on Figure 2-12 and are labeled GMW-1 through GMW-3.

The principal components of the system are:

- Twenty-two (22) extraction wells, consisting of 4-inch diameter PVC perforated and solid piping extending into the refuse. Each well head includes an isolation valve and fittings for pressure gauges and a flexible hose connection to a 3-inch diameter polyethylene solid pipe which conveys the extracted landfill gas to the gas transmission header.
- Transmission headers originating at a high point on the east side of the landfill and sloping continuously around the landfill to a low point adjacent to the blowers and flare station at the base of the landfill. The transmission header piping material is solid HDPE.
- A gas venting layer (single-sided geocomposite and 9" subbase soils) and horizontal collection piping which conveys the gas that may accumulate at the surface of the landfill to the transmission headers. (Refer to Figure 2-1).
- Horizontal collection piping around the periphery of the landfill that conveys the gas that may accumulate at the base of the landfill to the flaring station and limits the off-site migration of the gas.
- A gas/condensate separator located adjacent to the flare station. The condensate flows by gravity, through double wall containment piping, to Manhole D-2 of the downgradient leachate collection drain system. The separator is connected to an 8-inch diameter HDPE inspection pipe riser.
- Blowers and a flare station which vacuum up to 1500 cfm of landfill gas and oxidize the landfill gas through combustion in a 7-foot diameter by 40-foot high enclosed gas flare.

In addition to the active gas collection system, a passive ventilation system was installed at the surface of the landfill for venting landfill gas during construction and upon completion of

the post-closure period. The passive vent system connects to the gas venting geocomposite and includes two horizontal gas transmission trenches (see Figures 2-1 and 2-10) and six HDPE vents. The trenches and vents are located across the top of the landfill and release the gas to the atmosphere when opened. The 22 gas extraction wells may also be used to vent the landfill.

While the active (i.e. mechanically assisted) gas venting system and flare are in use, these passive vents are to remain closed. Upon decommissioning of the active system and flare (when the gas generation rate and composition no longer warrant thermal destruction), the blind flanges must be removed from the passive vents and vent plugs must be removed from the extraction wells.

2.5.2 Blower and Flare System Operation

After collection and conveyance, landfill gas passes through the condensate separator. Condensate, removed in the separator, flows by gravity to Manhole D-2 (see Figure 2-10). The landfill gas passes through a 10-inch control valve immediately upstream of the blowers. The blower(s) discharge to the enclosed flare through a 10-inch flow meter. The blowers and flare system includes Control Panel 101, Control Panel 102, Control Panel 103, main disconnect switch and control transformer. Refer to Section 5.0, Volume III.

Nitrogen gas from a nitrogen cylinder, is used to position the 10-inch control valve. Propane gas, from a propane cylinder, is used to fuel the pilot flame in the enclosed flare. The flare unit is supplied with purge air blower, automatic and manual dampers.

Step-by-step operating procedures are detailed in the John Zink Company Operating Manual included in Volume II, Section 12. The following discussion is a general guideline for operating the flare.

- The burner management system includes a flame safeguard package that monitors key parameters and shuts the unit down if an unsafe condition occurs. The key shutdown interlocks are as follows:

High Flare Temperature
Flame Failure
Low Purge Air Flow (in Purge Cycle)
Low Temperature (if applicable)

- A basic start up will typically consist of the following steps:

Stack Purge
Pilot Ignition
Initiate Waste Gas Flow
Heat Up to Operating Temperature (1600°F - 1800°F)

- Prior to lighting the pilot, the stack must be purged with fresh air to ensure that there are no potentially explosive gas/air mixtures inside. A purge air blower is included for this purpose. In order to ensure a safe atmosphere for igniting the pilot, the purge air blower should run for a minimum of 5 minutes to evacuate gases which may have leaked in through the piping system.
- After the stack has been purged, the pilot should be immediately lit. Failure to light the pilot within 30 seconds will require that the vessel be purged again to avoid an explosive mixture forming inside the vessel.
- The pilot ignition sequence can be either an automatic or manual operation. Once the ignition button is depressed in the manual mode or the purge is completed in the automatic mode, the pilot solenoid valve should open and the ignition transformer will be energized.
- Once the pilot is proven, the inlet valve may be opened and the blower(s) may be activated to initiate flow to the flare.
- After the gas flow has been started, the temperature controller will begin closing the air damper(s) to heat the vessel to the required operating temperature.

2.5.3 Electrical System

Electrical power to the equipment and components of the landfill gas collection and flaring system is supplied through two (2) explosion-proof, dust-tight, weatherproof electrical control panels, one high voltage power Panel "G" and one low voltage power "Panel G-1".

The primary feeder to "Panel G" is taped from bus trip 1-H of the Motor Control Center (MCC). A 200A transfer switch is provided prior to entering "Panel G" for future connection to stand by power.

2.5.3.1 Power "Panel G"

Power Panel "G" is a 480V, 3Ø, 60HZ, 4-W high voltage panel that houses the main electrically operated circuit breaker, framed at 225A and four other circuit breakers framed at 100A. Circuit, with a 30A trip element, is a spare. Circuits 2 and 3, with 70A trip element, feed the two 30 HP waste flare blower. Circuit 4, with a 40A trip, feed the low voltage "panel G-1" through a 15KVA transformer.

2.5.3.2 Power "Panel G-1"

"Panel G-1" is a 120/280V, 3Ø, 60HZ, 4W low voltage panel with a main three-pole circuit breaker framed at 100A and eight one-pole branch breakers, that feed the ground fault outlet, the flare area site lighting, and the flare and blower control panels.

2.6 ANCILLARY SYSTEMS

The ancillary systems consist of the remaining miscellaneous landfill closure components which were not covered in the previous sections. They typically include roads, fencing, gates, locks, signage and miscellaneous items.

2.6.1 Access Roads

There are four major access roads at the Site. These are the IRM Road located along the southwest boundary of the Site and Roads A, B and C, the three landfill access roads located on the landfill surface. The locations of these access roads are shown on Figure 2.2.

The IRM access was constructed of crushed stone material meeting requirements of New York State Department of Transportation (NYSDOT) specifications with a maximum stone size of 2 inches. The thickness of the crushed stone material is variable along the length of the access road. The cutoff wall was constructed roughly along the alignment of the IRM Road. In order to protect the cutoff wall, which is composed of soft soil/bentonite backfill, from damage and prevent excessive pumping and rutting along the IRM Road due to heavy traffic crossing the cutoff wall, a reinforced concrete slab was constructed spanning the wall. The concrete slab is approximately 15 feet wide and centered over the cutoff wall. (See Figure 2-5). In addition, a geogrid fabric was installed within the stone layer over the concrete slab.

Other access roads on the Site (Roads A, B, and C) were constructed of a crushed stone base material having a maximum stone size of 2 inches. The minimum thickness of the crushed stone base was approximately three (3) inches. The access roads on the landfill have reflecting roadway delineators along the exterior edge of the road, spaced approximately 25 feet apart.

2.6.2 Fencing

An eight-foot high chain link security fence surrounds the perimeter of the Site. Two 24 ft wide double leaf gates and one 12 ft wide single leaf gate are located near the main entrance to the facility. A fourth gate is located along Shore Road just south of Sedimentation Pond C. Each gate has a padlock with keys kept by Site Security.

Other fenced areas at the Site include:

- Gas Flare Unit
- IRM Fenced-in Complex and two adjacent fenced enclosures surrounding leachate pumping wells
- Twenty-two gas extraction well enclosures
- Motor Control Center
- Decontamination Trailer
- Leachate Storage Tank Area

Each of these isolated fenced areas has a gate and padlock.

2.7 ENVIRONMENTAL COMPLIANCE

Facility wide environmental compliance is demonstrated and documented through a series of established environmental monitoring and recordkeeping programs which are described in detail in Volume III, Section 6 of the OM&M Manual. In general, the monitoring components of the Pelham Bay Landfill include the monitoring of the following parameters: groundwater, leachate, stormwater, and landfill gas.

This monitoring plan is designed to enable the evaluation and effectiveness of the remedial measures, and to provide continuing water and air quality information including background (upgradient) and baseline data, and to provide early warning of future releases of contaminants to the environment. The environmental monitoring initially consisted of quarterly sampling for a one year period to establish a historical baseline. Monitoring continues and includes semi-annual monitoring of environmental media.

2.7.1 Elements of Monitoring Plan

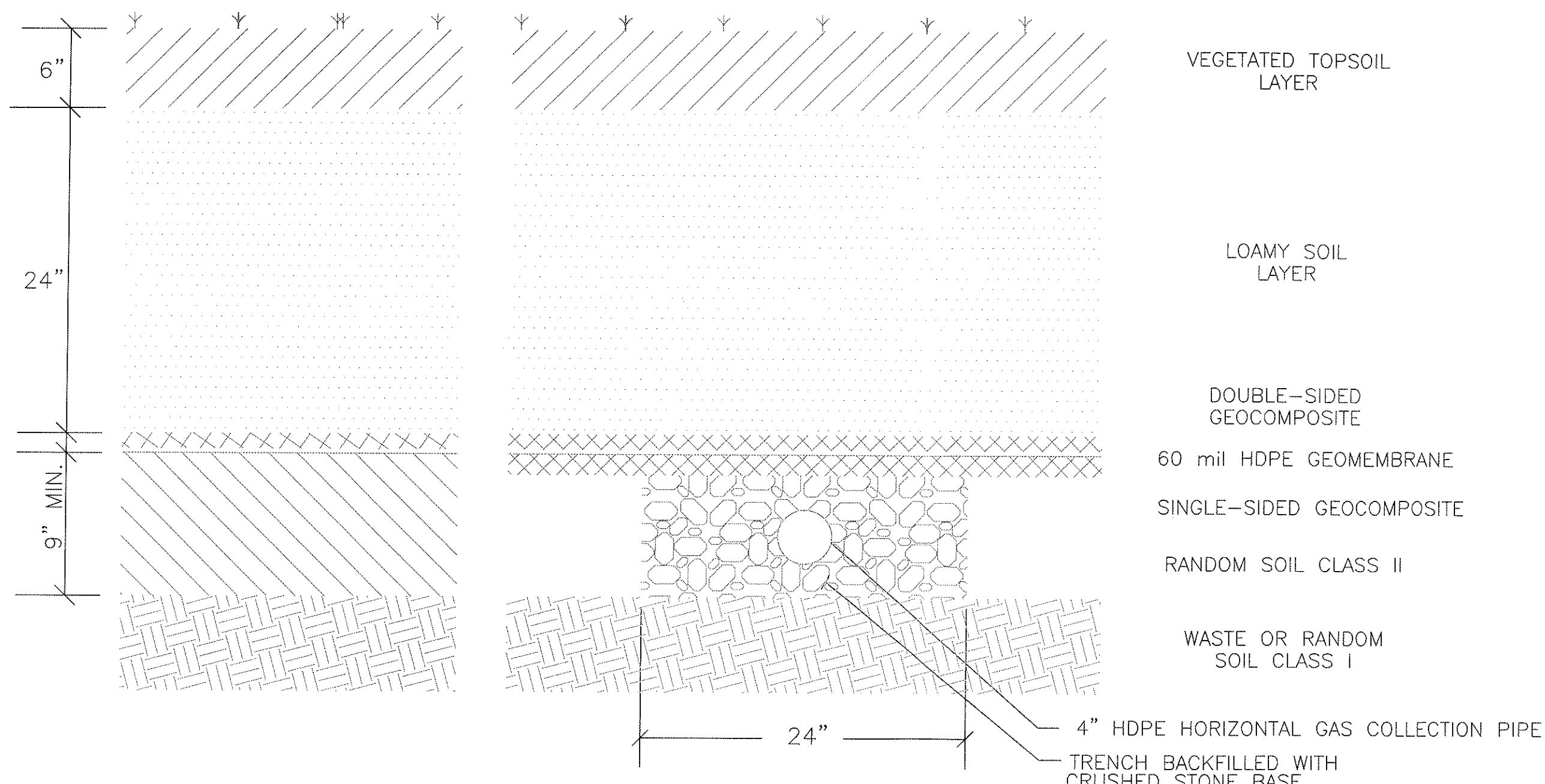
Elevation measurement of monitoring wells, along with sampling and analysis are detailed in Volume III, Section 6.0 Environmental Monitoring and Testing. A total of eleven (11) wells within Pelham Bay Landfill used for groundwater sampling and analysis constitute the long-term monitoring network for groundwater at the site. Monitoring wells are also used to monitor groundwater elevations: In addition to the groundwater monitoring wells, one (1) leachate sample is collected and analyzed semi-annually, two (2) stormwater samples are collected and analyzed semi-annually, along with four (4) landfill gas monitoring well samples, one (1) flare condensate sample, and ten (10) surface landfill gas samples.

TABLE 2-1
GROUNDWATER MONITORING WELLS AND PIEZOMETERS
PELHAM BAY LANDFILL

<u>Groundwater Monitoring Wells</u>				
<u>Within the landfill</u>	<u>Northing</u>	<u>Easting</u>	<u>Depth of Well⁽²⁾</u>	
MW-104	28179.490	-19030.697	19.33	
MW-106	26742.231	-18980.711	23.00	
MW-109	28784.326	-20169.171	17.10	
MW-110	26731.688	-19689.792	18.75	
MW-113	29070.315	-19814.674	12.35	
MW-114	28402.734	-20517.931	11.60	
MW-115	27911.455	-20754.435	42.90	
MW-115B	27904.201	-20755.529	75.98 ⁽¹⁾	
MW-118	26728.412	-19287.747	17.36	
MW-119	27200.090	-18950.844	30.26	
MW-120	27776.950	-18994.003	55.56	
MW-120B	27791.700	-18995.120	80.75	
MW-121	28578.134	-19121.503	42.25	
MW-122	28967.069	-19311.343	39.14	
MW-126	27770.025	-19860.461	138.44	
<u>In Pelham Bay Park</u>				
MW-117	26639.141	-20177.984	20.15	
MW-117B	26615.782	-20186.704	79.78	
MW-124	26498.996	-20818.821	13.98	
MW-124B	26520.305	-20800.748	69.67	
<u>Cutoff Wall</u> <u>Piezometers</u>	<u>Cutoff Wall</u> <u>Station</u>	<u>Northing</u>	<u>Easting</u>	<u>Depth of</u> <u>Piezometer⁽²⁾</u>
PZ-A	3+50	27086.42	-20723.45	N/A
PZ-B	3+50	27076.00	-20740.10	N/A
PZ-C	7+00	26788.59	-20542.13	N/A
PZ-D	7+00	26779.01	-20559.73	N/A
PZ-E	11+90	26670.75	-20213.62	N/A
PZ-F	11+90	26646.63	-20201.12	N/A

Notes: Wells and piezometers shall be developed and depth to bottom of well verified by the O&M Contractor prior to first sampling event.
N/A = Not Available

- (1) Well MW-115B was cased with 3" steel casing to a depth of 55.98 and is an open hole from that point to a depth of 75.98.
- (2) The depth of well or piezometer is measured from the top of the PVC standpipe to the bottom of the PVC standpipe.



TYPICAL CAP SIDE SLOPE OF THE LANDFILL—TEXTURED GEOMEMBRANE

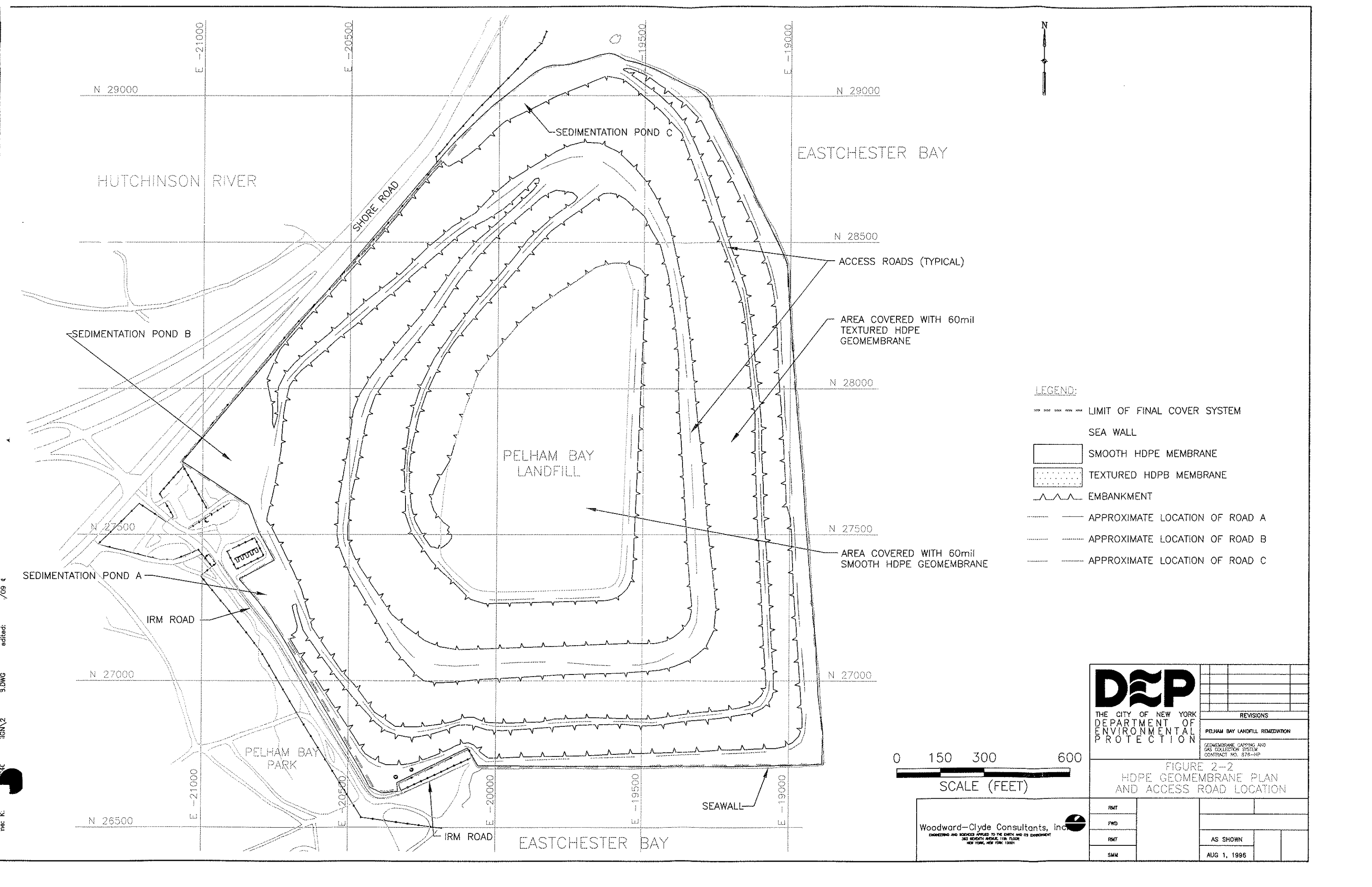
TYPICAL CAP TOP OF THE LANDFILL—SMOOTH GEOMEMBRANE

NOTES:

1. THE GEOCOMPOSITE CONSISTS OF GEOTEXTILE FILTER FABRIC HEAT BONDED TO GEONET.

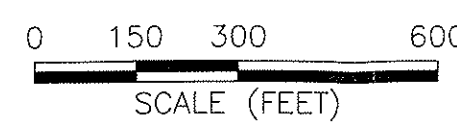
NOT TO SCALE

<p>THE CITY OF NEW YORK DEPARTMENT OF ENVIRONMENTAL PROTECTION</p>			
		<p>GEOMEMBRANE CAPPING AND GAS COLLECTION SYSTEM CONTRACT NO. 876-HP</p>	
<p>FIGURE 2-1 LANDFILL CAP CONSTRUCTION</p>			



LEGEND:

- LIMIT OF FINAL COVER SYSTEM
- SEA WALL
- SMOOTH HDPE MEMBRANE
- TEXTURED HDPB MEMBRANE
- EMBANKMENT
- APPROXIMATE LOCATION OF ROAD A
- APPROXIMATE LOCATION OF ROAD B
- APPROXIMATE LOCATION OF ROAD C



Woodward-Clyde Consultants, Inc.
ENGINEERING AND SCIENCE APPLIED TO THE EARTH AND ITS ENVIRONMENT
365 WEST 42ND AVENUE, 11TH FLOOR
NEW YORK, NEW YORK 10018

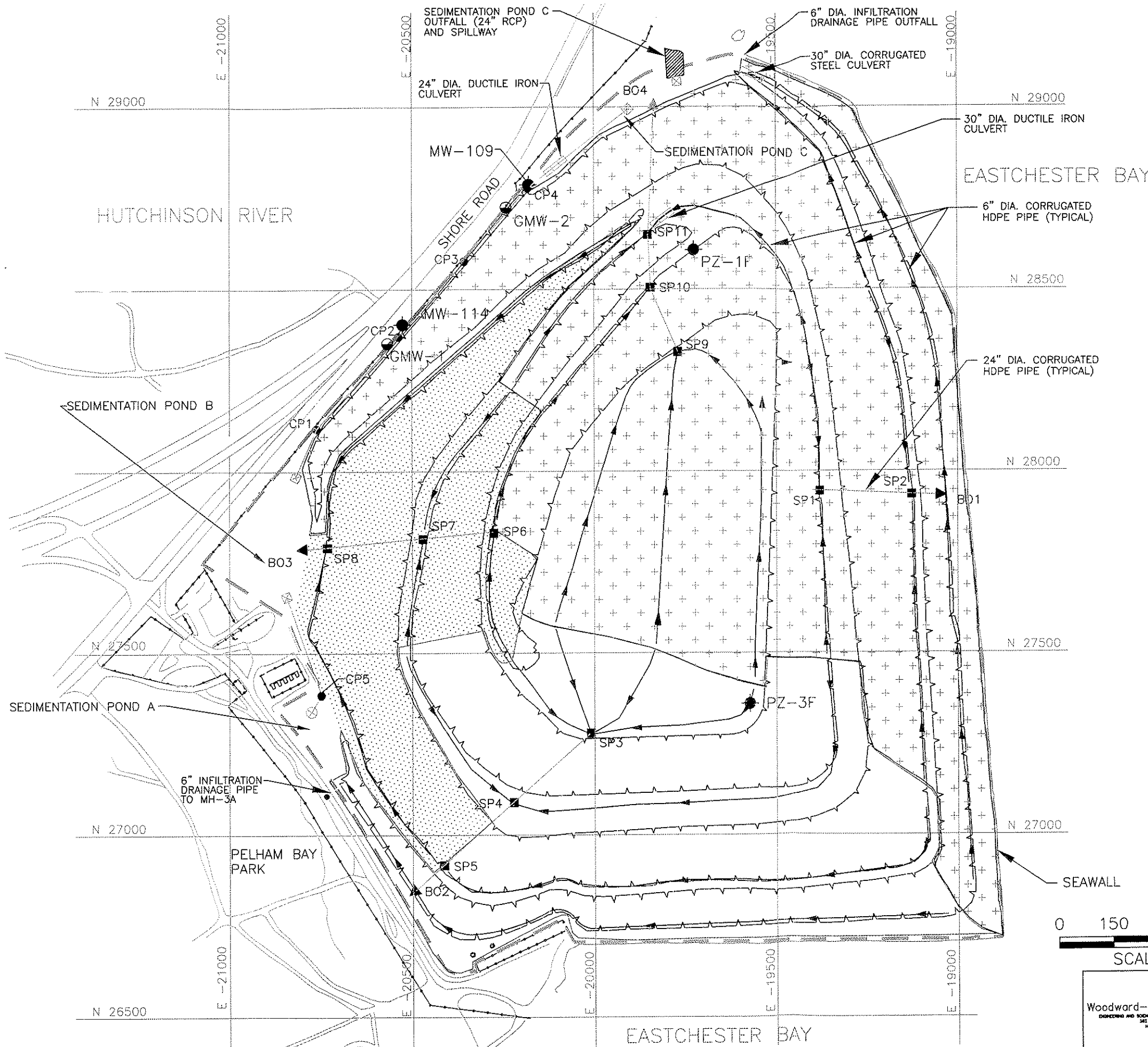
THE CITY OF NEW YORK
DEPARTMENT OF
ENVIRONMENTAL
PROTECTION

REVISIONS	
PELHAM BAY LANDFILL REMEDIATION	
GEOMEMBRANE CAPPING AND GAS COLLECTION SYSTEM CONTRACT NO. 87B-HP	

FIGURE 2-2
HDPE GEOMEMBRANE PLAN
AND ACCESS ROAD LOCATION

REV	DATE	BY	CHKD
AS SHOWN			
AUG 1, 1996			

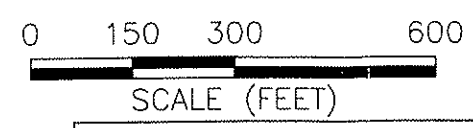
no: K: 10/09 4
edited: 3.DWG
10/09 4



LEGEND:

- SEDIMENTATION POND A CATCHMENT
- SEDIMENTATION POND B CATCHMENT
- SEDIMENTATION POND C CATCHMENT
- APPROXIMATE LIMIT OF FINAL COVER
- SEAWALL
- CULVERT
- SP1 HDPE STORMWATER COLLECTION MANHOLE/INLET
- CP1 HDPE SEDIMENTATION POND CONNECTION MANHOLE/INLET
- BO1 BAFFLED OUTLET
- SEDIMENTATION POND INLET/OUTLET STRUCTURES
- SEDIMENTATION POND A TRASHRACK AND OUTLET PIPE
- DIRECTION OF FLOW IN STORMWATER DRAINAGE DITCH AND INFILTRATION DRAINAGE TRENCH
- DIRECTION OF FLOW IN STORMWATER DRAINAGE DITCH ONLY
- DIRECTION OF FLOW IN INFILTRATION DRAINAGE TRENCH ONLY

NOTES:
SEE FIGURE 2-2 FOR APPROXIMATE LOCATIONS OF ROADS A, B, C AND IRM ROAD

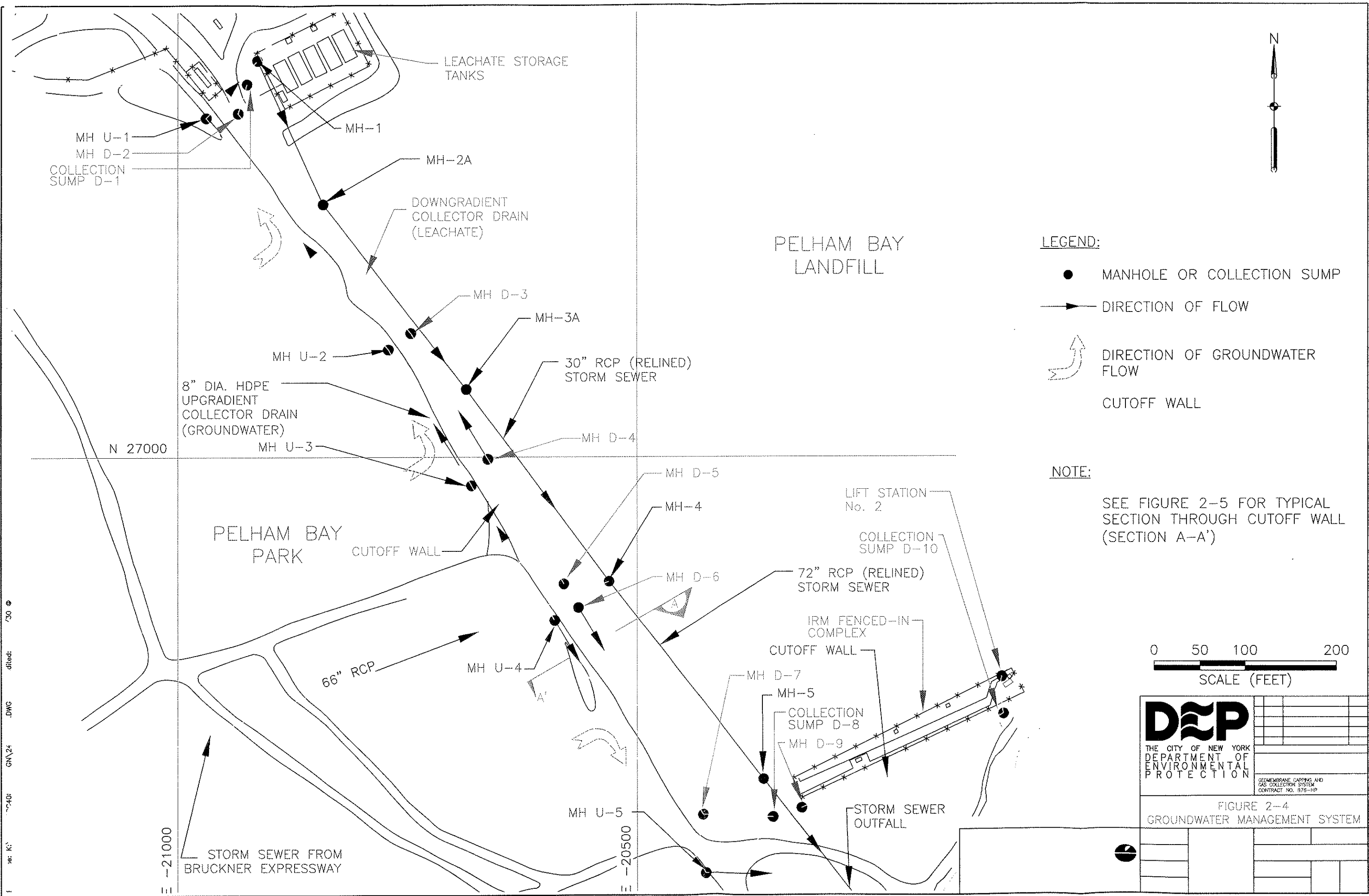


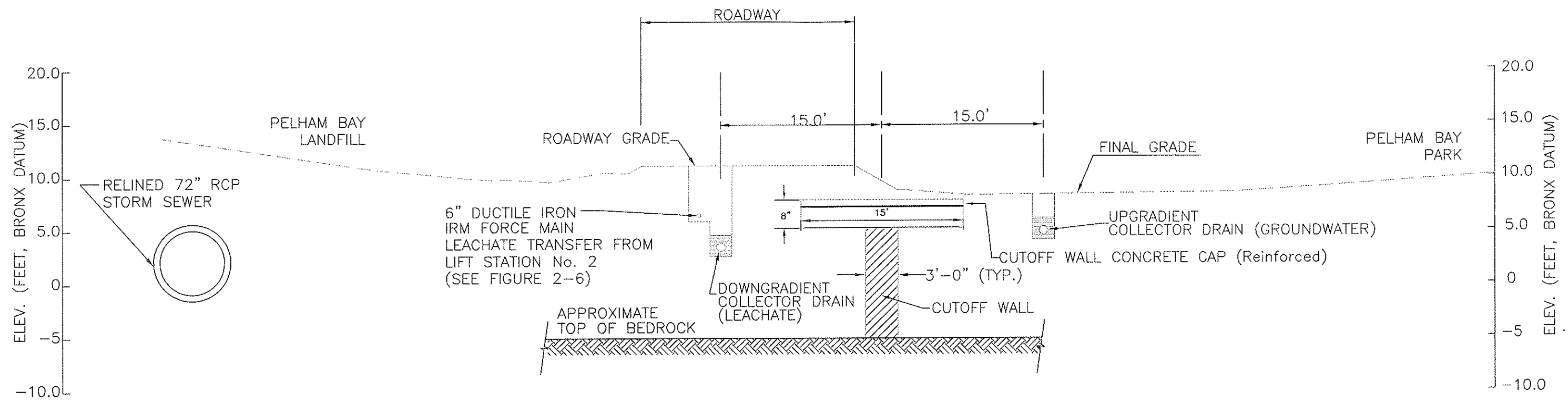
REVISIONS	
1	PELHAM BAY LANDFILL REMEDIATION
GEOMEMBRANE CAPPING AND GAS COLLECTION SYSTEM CONTRACT NO. 875-HP	

**FIGURE 2-3
STORMWATER MANAGEMENT SYSTEM**

Woodward-Clyde Consultants, Inc.
ENGINEERING AND SERVICES APPLIED TO THE EARTH AND ITS ENVIRONMENT
345 BROADWAY, 11TH FLOOR
NEW YORK, NEW YORK 10001

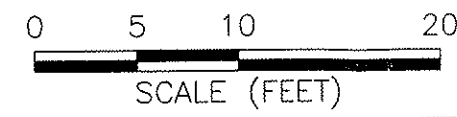
RMT			
FWD			
RMT			
SKM			
AS SHOWN			
AUG 1, 1996			





SECTION A-A'
(NOT TO SCALE)

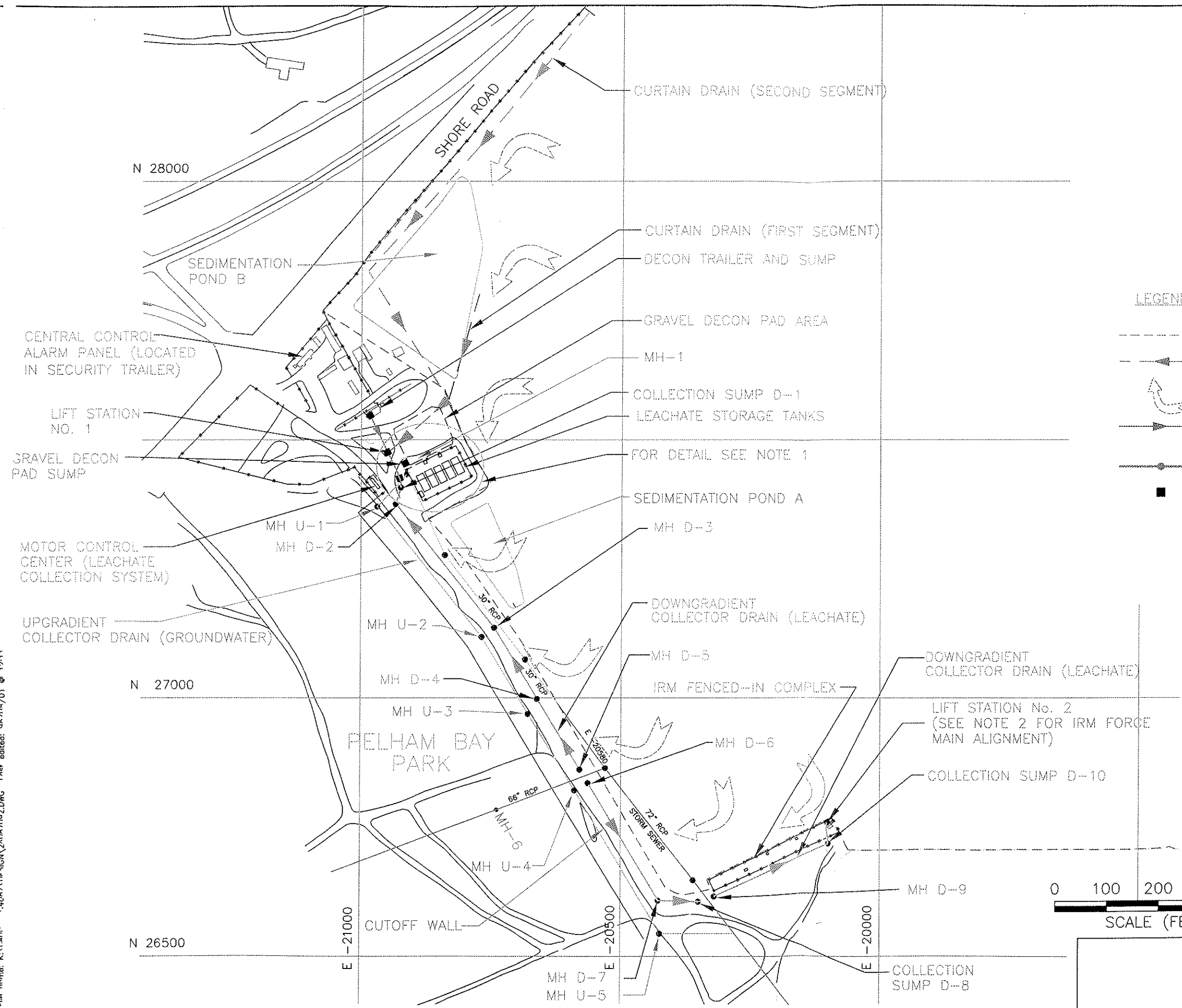
NOTE: SEE CONTRACT HP-875 AS-BUILTS FOR LOCATION OF ELECTRICAL CONDUITS



THE CITY OF NEW YORK DEPARTMENT OF ENVIRONMENTAL PROTECTION		SEDIMENTATION, CAPING AND GAS COLLECTION SYSTEM CONTRACT NO. 875-HP	
FIGURE 2-5 TYPICAL SECTION THROUGH CUTOFF WALL			

File name: K:\Plan\40711\DESIGN\240711\DESIGN.DWG Plot edited: 06/08/09 11:25

File name: K:\CADD\24087\DESIGN\2408702.DWG Plot date: 05/04/07 DESIGNED: 2408702.DWG 1 of 1 edited: 05/04/07 12:11

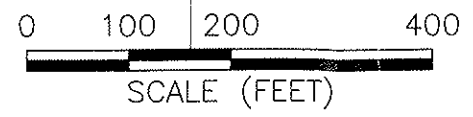


LEGEND:

- LIMIT OF LANDFILL CAPPING SYSTEM.
- > CURTAIN DRAIN(S) (WITH DIRECTION OF FLOW INDICATED).
- ↪ DIRECTION OF LEACHATE FLOW.
- > DOWNGRADIENT COLLECTOR DRAIN (LEACHATE) (WITH DIRECTION OF FLOW INDICATED).
- DRAIN MANHOLE OF COLLECTION SUMP.
- COLLECTION SUMP OR LIFT STATION WITH PUMPS.

NOTES:

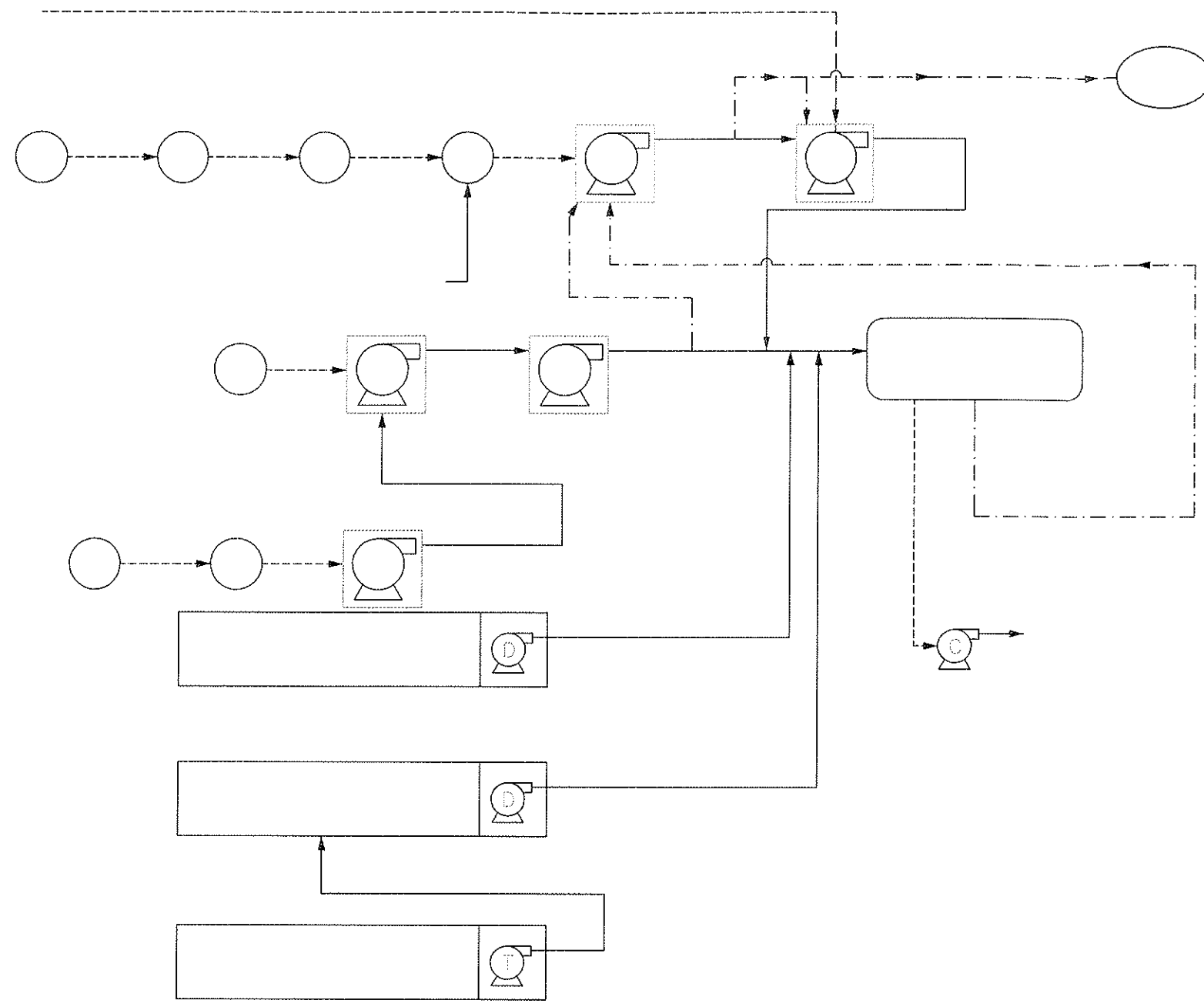
- SEE FIGURES 2-8 AND 2-9 FOR DETAILS OF LEACHATE STORAGE TANK AREA LAYOUT, GRAVEL DECON PAD AND ASSOCIATED COLLECTION SUMPS.
- FORCE MAIN CONNECTING LIFT STATION NO. 2 TO COLLECTION SUMP D-1 IS ABOVE GROUND IN THE IRM FENCED-IN COMPLEX AND BELOW GROUND THE REMAINDER OF ITS LENGTH. THE UNDERGROUND PORTION FOLLOWS THE ALIGNMENT OF THE DOWNGRADIENT COLLECTOR DRAIN FROM OUTSIDE THE FENCED-IN COMPLEX TO COLLECTION SUMP D-1. (SEE FIGURE 2-5 FOR TYPICAL SECTION).



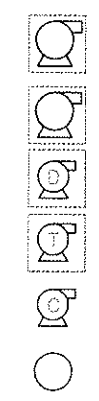
THE CITY OF NEW YORK
DEPARTMENT OF
ENVIRONMENTAL
PROTECTION

DESIGNER: []	
DATE: []	
PROJECT: []	
SHEET: []	
CONTRACT NO. 875-HP	
FIGURE 2-6 LEACHATE COLLECTION SYSTEM	





LEGEND:

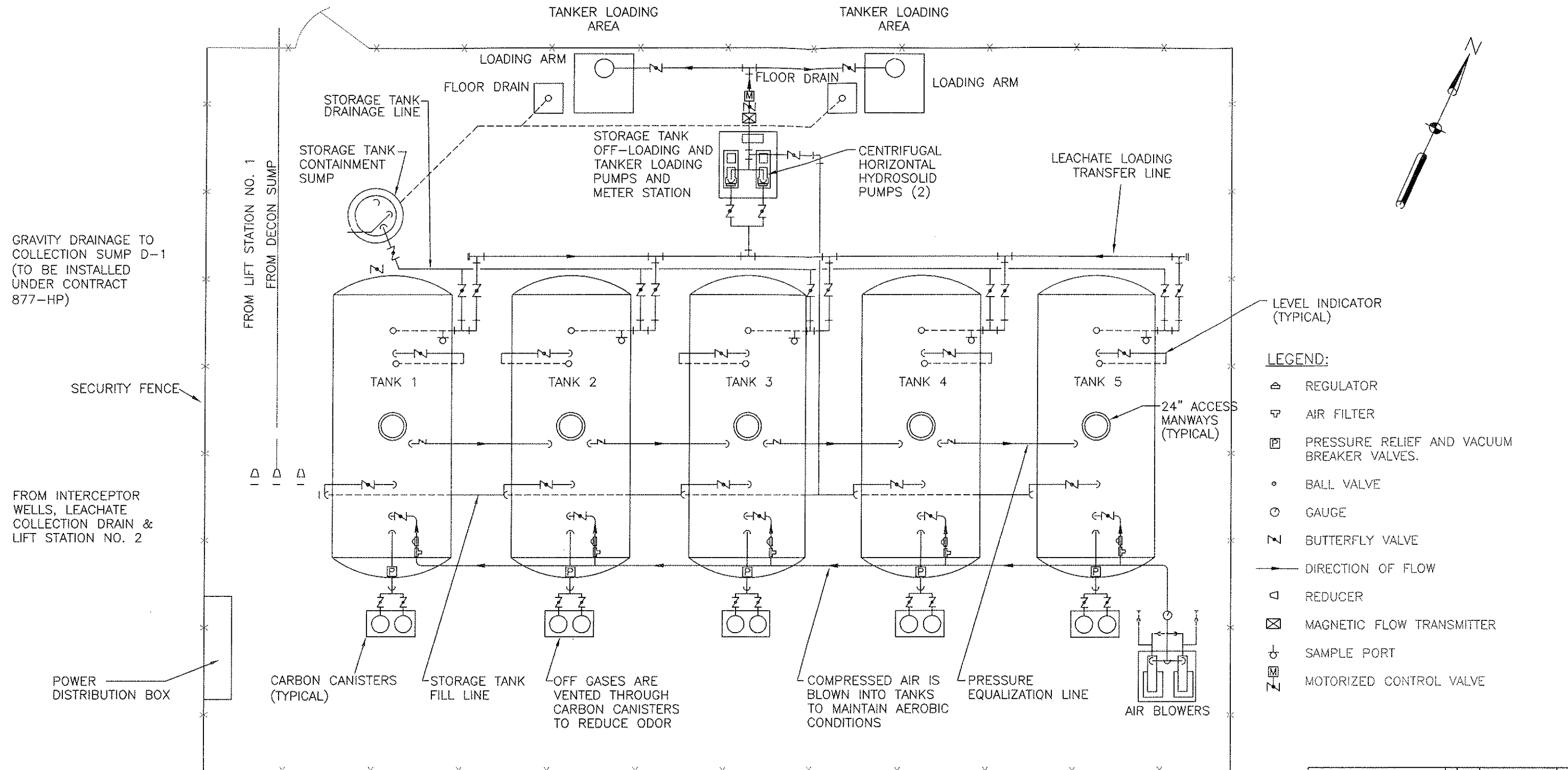


NOTES:

<p>THE CITY OF NEW YORK DEPARTMENT OF ENVIRONMENTAL PROTECTION</p>				
		<p>GEOMEMBRANE CAPPING AND GAS COLLECTION SYSTEM</p>		
		<p>FIGURE 2-7 SCHEMATIC DIAGRAM LEACHATE COLLECTION SYSTEM</p>		

NOT TO SCALE





LEGEND:

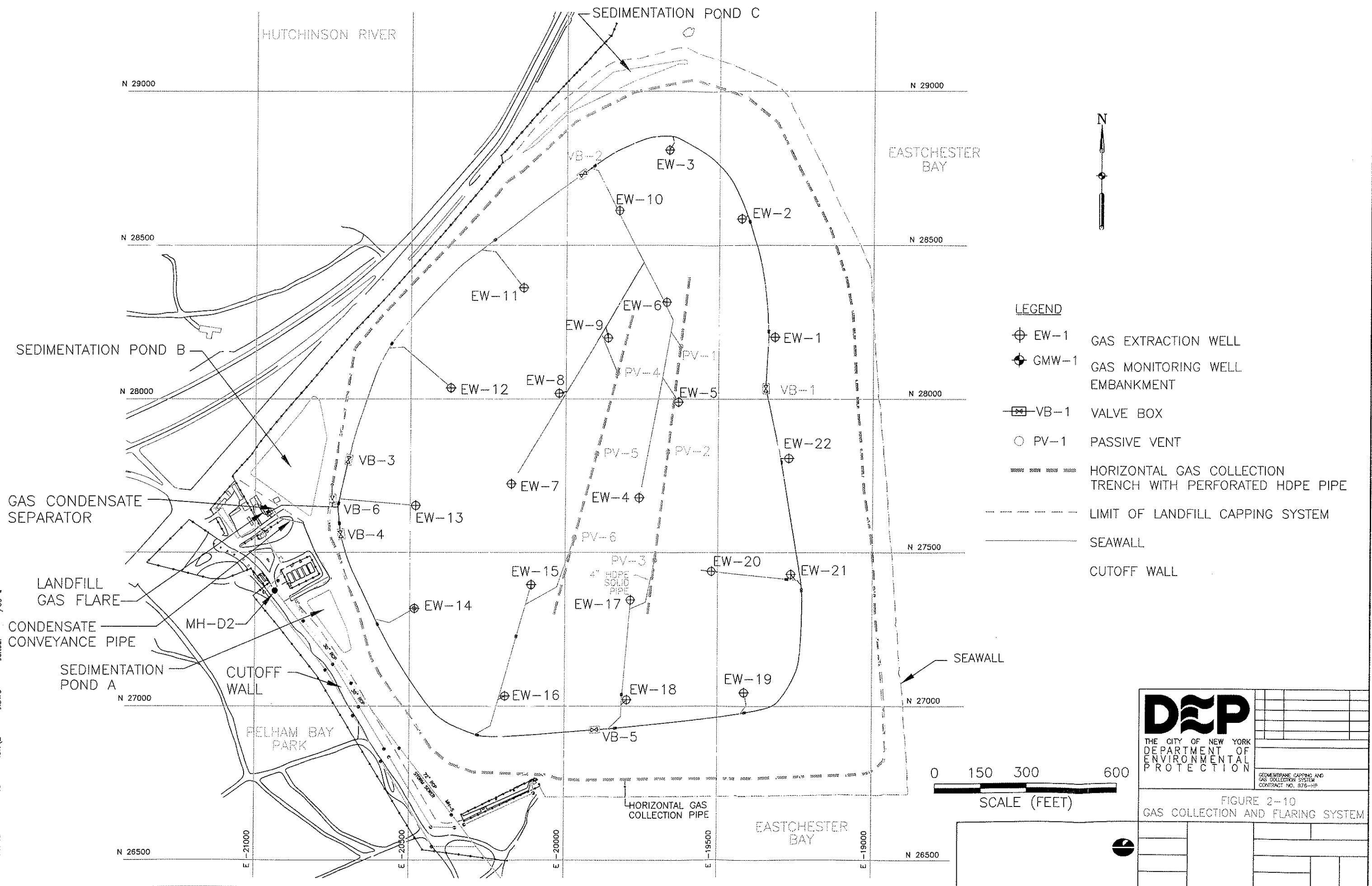
- REGULATOR
- AIR FILTER
- PRESSURE RELIEF AND VACUUM BREAKER VALVES.
- BALL VALVE
- GAUGE
- BUTTERFLY VALVE
- DIRECTION OF FLOW
- REDUCER
- MAGNETIC FLOW TRANSMITTER
- SAMPLE PORT
- MOTORIZED CONTROL VALVE

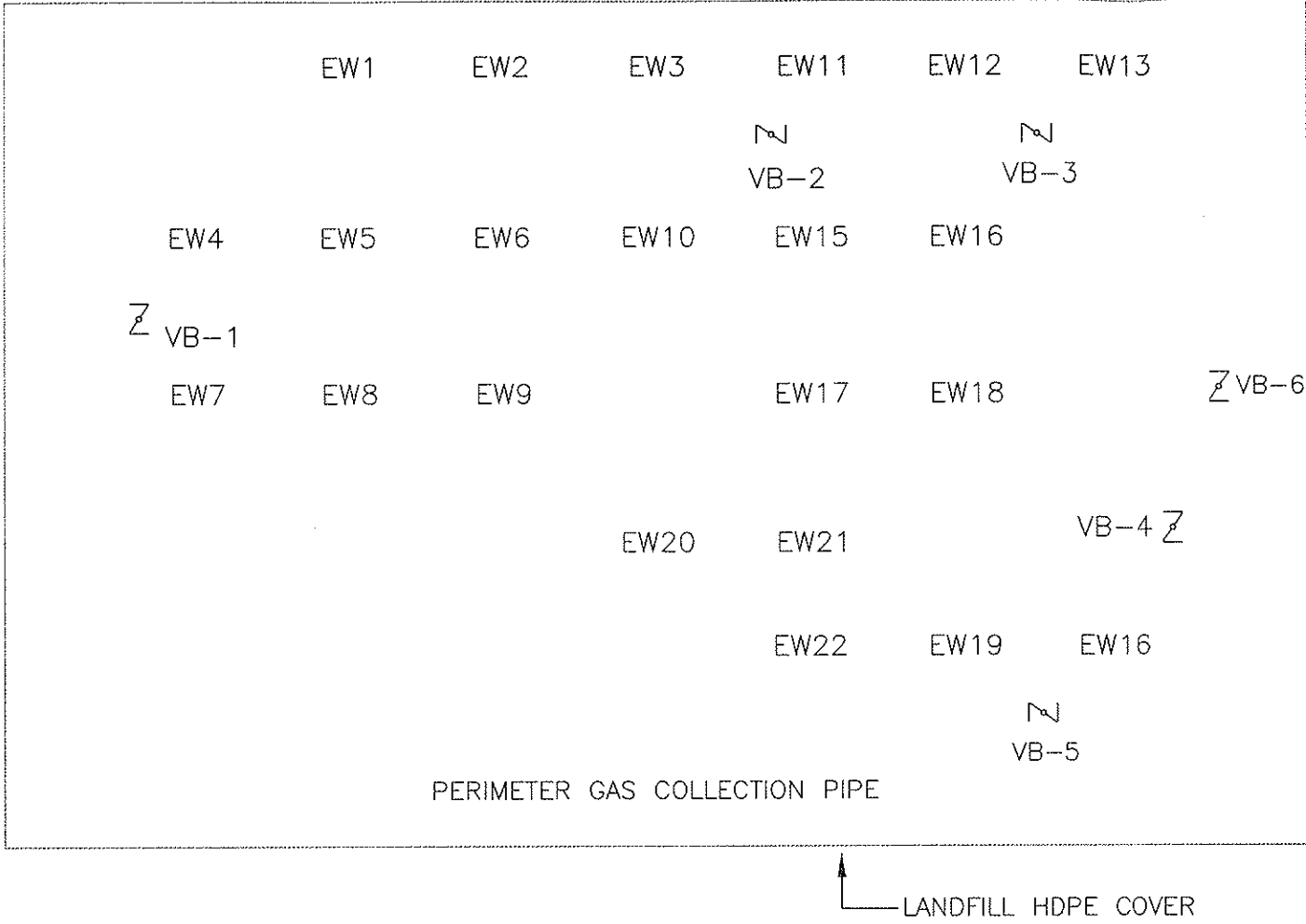
NOTES:

1. LEACHATE STORAGE TANK AREA OPERATION AND MAINTENANCE IS DESCRIBED IN THE LEACHATE COLLECTION AND HANDLING SYSTEM SOP (HAZEN AND SAWYER, MAY 13, 1993)
2. FOR DETAILS OF TANK STORAGE AREA SEE RECORD DRAWINGS FOR CONTRACTS No. HP-867 AND HP-868.

NOT TO SCALE

THE CITY OF NEW YORK DEPARTMENT OF ENVIRONMENTAL PROTECTION		GEOMEMBRANE CAPING AND GAS COLLECTION SYSTEM CONTRACT NO. 875-HP	
FIGURE 2-8 LEACHATE STORAGE TANK AREA SCHEMATIC			






LEGEND

- EW1 GAS EXTRACTION WELL
- — — — — HORIZONTAL GAS COLLECTION TRENCH WITH PERFORATED HDPE PIPE
- LFG LANDFILL GAS
- VB-3 VALVE BOX WITH BUTTERFLY VALVES
- 30 HP BLOWER
- CHECK VALVE
- BUTTERFLY VALVE
- 1 HP PURGE BLOWER
- 10" FLAME ARRESTER

NOTE:
FOR COMPLETE PIPEWORK AND CONTROLS FOR THE LFG BLOWER AND ENCLOSED FLARE SEE JOHN ZINK OPERATING MANUAL FOR 7' x 40' ZTOF ENCLOSED GROUND FLARE SYSTEM, SECTION 12, VOLUME II OF THE O & M MANUAL.

NOT TO SCALE



THE CITY OF NEW YORK
DEPARTMENT OF
ENVIRONMENTAL
PROTECTION

GEOMEMBRANE CAPPING AND GAS COLLECTION SYSTEM CONTRACT NO. 278-HP	
FIGURE 2-11 LANDFILL GAS COLLECTION SYSTEM SCHEMATIC	

3.1 ORGANIZATION

Operation, Maintenance, and Monitoring of the Pelham Bay Landfill shall be the responsibility of the OM&M Contractor under contract with the NYCDEP. Subcontractor activities (if any) shall be directed through the OM&M Contractor.

3.2 STAFFING REQUIREMENTS

The NYCDEP Bureau of Wastewater Treatment will appoint a project manager and contract with the OM&M Contractor.

The OM&M Contractor shall, when needed, provide professional engineer(s), technician(s), mechanic(s), electrician(s), plumber(s), chemist(s), engineer(s), surveyor(s), etc. as needed to accomplish the following activities/tasks specific to the OM&M at the Site:

- General site inspection
- Cover system inspection and maintenance
- Stormwater system inspection and maintenance
- Control surveys
- Leachate collection and disposal system operation and maintenance
- Landfill gas collection and flaring system operation and maintenance
- Equipment inspection and maintenance
- Environmental sampling
- Groundwater level measurement
- Laboratory Testing
- Analytical data validation
- Subcontractor procurement/management (when required)
- Scheduling and inspection of subcontractor activities
- Reporting

- Emergency Response/Health & Safety

The OM&M Contractor shall establish an experienced team to conduct these tasks. The Contractor shall assign one (1) person as project manager responsible for the daily OM&M of the Site and as a point of contact with the NYCDEP. The team members shall report to the OM&M Project Manager who will be responsible for employing the proper personnel or subcontractors and delegating specific work assignments. The following personnel have some of the skills that may be required:

- Professional Engineer(s)
- Certified Electrician(s)
- Certified Plumber(s)
- Technician(s)
- Health and Safety Officer
- Botanist

In addition to the services supplied by the OM&M Contractor's own personnel, the OM&M Contractor should employ the services of qualified and licensed subcontractors (when needed). Typically, this would be for:

- Cap maintenance
- Mowing and snow removal
- Groundwater/leachate management system repair
- LFG collection and flaring system repair
- Mechanical/electrical equipment maintenance
- Environmental sampling and testing

Typical services that could be utilized on an as-needed basis may include:

- Geosynthetic Installers
- Earthwork Subcontractor
- Flare System Technical Representative

- Landscaping Subcontractor
- Pest Control Subcontractor

3.3 RESPONSIBILITIES AND DUTIES

NYCDEP Project Manager

The NYCDEP Project Manager will responsible for all primary decisions, technical and budgetary, related to OM&M at the Site.

The NYCDEP Project Manager will have the responsibility of retaining the OM&M Contractor, and overseeing the activities of the OM&M Contractor.

OM&M Project Manager

The OM&M Contractor shall designate an OM&M Project Manager for the overall administration of the OM&M Contract. He/she shall be responsible for all contract related decisions, and to assure that all activities for this assignment are carried out in accordance with the terms of the OM&M Contract, the Site OM&M manual, and the NYCDEP Project Manager's instructions.

The OM&M Project Manager shall manage the day-to-day activities of all staff members of the OM&M Contractor. He/she shall be responsible for maintaining the project schedule and controlling the budget, as well as for the technical content of all work done by the OM&M Contractor. The OM&M Project Manager shall communicate directly to his/her counterpart at NYCDEP. All project related activities and communications between the OM&M Contractor and the NYCDEP shall be coordinated through the respective Project Managers. The OM&M Project Manager shall have at least 2 years experience with managing mechanical and electrical systems and operations personnel.

Specifically, the OM&M Project Manager and his administrative staff shall perform the following duties:

- Supervise OM&M activities described in this OM&M manual
- Supervise and manage the daily operation and normal maintenance activities for the Site.
- Respond/coordinate response to site component malfunctions and upsets, as needed.
- Set up a record management system.
- Schedule meetings as required.
- Take and prepare minutes of all meetings.
- Maintain records regarding site operation and maintenance activities.
- Ensure that the Site operations function in compliance with the rules, regulations, and permits of the NYCDEP and the NYSDEC.
- Supervise routine operational compliance testing (specified in the permit).
- Train operational staff.
- Ensure that proper operation, maintenance, and safety procedures are employed.
- Plan and schedule the utilization of equipment, personnel, and materials.
- Perform long-term planning and budgeting functions.
- Prepare budget requests.
- Report to, and confer with, superiors regarding personnel, equipment and materials necessary for plant operations.
- Supervise the preparation of requisitions and control of stock inventory.
- Develop cost analyses for the operation and project expenditures.
- Prepare estimates for partial payment.
- Manage all monitoring, sampling, testing, and evaluating activities with appropriate entities.
- Coordinate and supervise subcontractors and/or vendors.
- Ensure that safety precautions for employees and subcontractors are exercised and adhered to.
- Transmit all required reports to the NYCDEP.

Qualified Technician(s)

A qualified technician(s) shall be responsible for the normal operation and maintenance of the Site. The technician(s) shall work under the supervision of the OM&M Project Manager

and be suitably trained to perform the work. Technicians shall be responsible for performing the following tasks:

- Routine equipment maintenance as specified in this manual or recommended in the equipment manuals.
- Normal inspection and maintenance of the site's components.
- Data-gathering and maintenance of systems.
- Data-gathering and routine sampling and testing.
- Adjustments to the system's operation, as necessary.
- Locating and correcting operational problems within the systems, as necessary.
- Manual labor, such as material handling and maintenance.
- Supervision of other laborers, as specific tasks require.

Subcontractors (If Required)

The responsibilities and duties of any subcontractors (if required) for specific activities at the Site (leachate, LFG, landscaping, maintenance, etc.) shall be clearly spelled out in an agreement with the OM&M Contractor. NYCDEP shall be provided a minimum of two weeks to review this agreement(s) before execution. The scope of such activities shall be in accordance with the procedures described in this manual.

3.4 QUALIFICATIONS

The OM&M Contractor shall ensure that their personnel (including subcontractors, if any) are suitably qualified and have the education and experience necessary to effectively and safely execute all tasks/duties assigned to them as part of the OM&M for this Site.

3.5 TRAINING

All personnel shall have completed instruction/training programs required to conduct their assignments. These programs may include, but are not limited to the following:

- Health and Safety

- Organization
- First Aid
- Equipment Operation
- Record Keeping Practices
- Environmental Monitoring

The OM&M Project Manager shall be responsible to insure all of the operational staff are properly trained to perform their tasks. Training protocols shall include various aspects of site component management procedures, facility and equipment inspections, material handling procedures, maintenance, safety, emergency response procedures, and proper use of facility and personal protective and emergency equipment in accordance with applicable OSHA regulations.

Each employee of the OM&M Contractor responsible for OM&M of the Site shall be instructed in the importance of the inspection and maintenance procedures required at the Site. As part of this training, employees shall receive training regarding required equipment inspections. Employees shall be familiarized with potential hazards at the Site and be trained to recognize potential problems and to take immediate action to correct them.

Safety and first-aid equipment inspections shall be performed at the start of the Contract and semi-annually thereafter. Employees shall be instructed in the importance of keeping all site safety equipment in good working condition. Procedures shall be given for employees to report any defects with safety equipment and shortages of first-aid supplies.

SAFETY POLICIES AND GUIDELINES

4.1 OVERVIEW

A written, project-specific health and safety plan (HASP) shall be prepared and implemented by the Contractor responsible for Pelham Bay Landfill Post Closure Operations, Maintenance and Monitoring (the "OM&M Contractor"). The Plan shall be provided to the NYCDEP for review a minimum of 30 days prior to the start of OM&M activities at the Site. This review by the NYCDEP does not constitute approval of the Plan or relieve the OM&M Contractor of any health and safety, or emergency response responsibilities. The safety policies and guidelines must conform to those of DEP and are suggestions designed to:

- Reduce the risk of employee injury and occupational illness;
- Satisfy regulatory requirements regarding health and safety; and,
- Satisfy NYCDEP health and safety and emergency response requirements.

All personnel involved with the operations, maintenance and monitoring activities at the Site are required to comply with these policies and guidelines, along with all applicable federal, state and local laws and regulations. NYCDEP expects priority commitment to health and safety from the OM&M Contractor; failure to comply may result in disciplinary action.

4.2 FIELD PROGRAM ORGANIZATION

For this project, the responsibilities and authorities of the OM&M Project Manager, the OM&M Project Health and Safety Officer (the "Project Health and Safety Officer"), and OM&M Site Safety Officer (the "Site Safety Officer"), related to health and safety, at a minimum, are as follows.

4.2.1 OM&M Project Manager

Responsibilities

- Assures that work activities are performed in a manner consistent with current OM&M Contractor and NYCDEP health and safety programs, and other relevant health and safety regulatory requirements;
- Assures that necessary project-specific Health and Safety Plans (HASPs), and Emergency Response Plans are prepared, submitted for review to the NYCDEP, and properly implemented;
- Implements necessary HASPs and Emergency Response Plans;
- Assures that adequate funds are allocated to fully implement project health and safety; and,
- Coordinates with the Project Health and Safety Officer on health and safety matters.

Authority (Safety Related)

- Assigns a Project Health and Safety Officer and, if necessary, a Site Safety Officer approved by the Project Health and Safety Officer;
- Suspends field activities if health and safety of personnel are endangered, pending an evaluation by the Project Health and Safety Officer; and,
- Suspends an individual from field activities for infractions of a HASP, pending an evaluation by the Project Health and Safety Officer.

4.2.2 OM&M Project Health and Safety Officer

Responsibilities

- Interfaces with the OM&M Project Manager in matters of health and safety;
- Develops necessary HASPs and/or Emergency Response Plans for the project for submittal to the OM&M Project Manager for approval;
- Monitors compliance with approved HASPs;
- Assists the OM&M Project Manager in seeing that proper health and safety equipment is available for the project; and,
- Approves personnel to work on the Site with regard to medical examinations and health and safety training.

Authority

- Suspends work or otherwise limits exposure to personnel if any HASP appears to be unsuitable or inadequate;
- Directs personnel to change work practices if these work practices are deemed to be hazardous to health and safety; and,
- Removes field personnel from the project if their actions or condition endangers their health and safety or the health and safety of co-workers.

4.2.3 OM&M Site Safety Officer

Responsibilities

- Directs health and safety activities at the Site;
- Completes Health and Safety Incident Reports, and reports within 24 hours of occurrence all safety related incidents or accidents to the Project Health and Safety Officer, OM&M Project Manager and the NYCDEP Project Manager;
- Assists the OM&M Project Manager in all aspects of implementing HASPs and Emergency Response Plans;
- Maintains health and safety equipment at the Site;
- Implements emergency procedures as required; and
- Submits monthly and annual accident reports (e.g., OSHA 200 log).

Authority

- Temporarily suspends field activities if health and safety of personnel are endangered, pending an evaluation by the Project Health and Safety Officer; and,
- Temporarily suspends an individual from field activities for infractions of a HASP, pending an evaluation by the Project Health and Safety Officer.

The OM&M Project Manager has overall responsibility for site safety; the Site Safety Officer has day-to-day responsibilities for monitoring and directing the Program. It is not necessary that three separate individuals be assigned the responsibilities described in this section. However, when the OM&M Contractor is working at the Site, one qualified individual must be designated as the Site Safety Officer and have the responsibilities and authorities set forth in Section 4.2.3.

4.2.4 Other Personnel

All field personnel shall be advised and trained in their safety responsibilities by the OM&M Contractor. They shall be required by the OM&M Contractor to comply with all the policies, procedures and permits applicable to the ongoing work. Safety responsibilities of individual workers include, but are not limited to, the following:

- Performing every job in a safe manner for the benefit of self, co-workers, other contractors or subcontractors, and public; and the protection of facilities;
- Immediately reporting every injury to the Site Safety Officer, regardless of severity;
- Reporting unsafe conditions and practices to a supervisor and correcting where possible;
- Participating in safety meetings and training;
- Assisting in reporting and investigating incidents, injuries and serious potential incidents; and,
- Reviewing and becoming familiar with the contents of the Program, all necessary HASPs and Emergency Response Plans, and pertinent safety manuals, handbooks and publications.

4.3 REGULATORY REQUIREMENTS

The health and safety information provided herein is intended to provide guidance to the OM&M Contractor during performance of operations and maintenance activities at the Site. This information shall not be considered as all-inclusive in regard to health and safety needs. The OM&M Contractor is responsible for compliance with all federal, state and local regulatory requirements. These requirements include, but are not limited to, the following OSHA Regulations:

General Training	29 CFR 1926.21
First Aid	29 CFR 1910.15 1, 29 CFR 1910.1030, 29 CFR 1926.23
Emergency Action Plan	29 CFR 1910.38
Hazardous Waste Operations	29 CFR 1910.120
Fire Extinguishers	29 CFR 1910.157
Housekeeping	29 CFR 1910.22, 29 CFR 1926.25
Illumination	29 CFR 1926.56
Hazard Communication	29 CFR 1910.1200, 29 CFR 1926.59
Noise/Hearing Conservation	29 CFR 1910.95, 239 CFR 1926.52
Personal Protective Equipment	29 CFR 1910.261, 29 CFR 1926.28
Confined Space Work	29 CFR 1910.146
Electrical Hazards	29 CFR 1926.403
Lockout/Tagout	29 CFR 1910.145
Elevated Work	29 CFR 1910.21
Ladders	29 CFR 1910.21, 29 CFR 1926.1053
Tools/Machinery	29 CFR 1926.301

Other safety requirements and guidelines shall be reviewed by the Project Health and Safety Officer for applicability to activities to be performed at the Site and possible implementation. This will include materials prepared by the following agencies and organizations:

- Mine Safety and Health Administration
- National Institute of Occupational Safety and Health
- American National Standards Institute, Inc.
- National Fire Protection Association
- New York State Department of Environmental Conservation
- New York City Department of Environmental Protection
- U.S. Environmental Protection Agency
- U.S. Army Corps of Engineers

4.4 GENERAL SAFETY RULES

The following general safety rules shall be reviewed, implemented and strictly adhered to by all workers, as appropriate:

- Immediately report all injuries or incidents to a supervisor. Attend to the injured or ill employee.
- All fires or spills or leaks of hazardous materials shall be reported immediately to a supervisor.
- All unsafe conditions shall be reported to a supervisor. Unsafe equipment shall be tagged with "DANGER - DO NOT OPERATE" tags.
- Whenever a safety device is disabled, removed from service, and/or defeated, a supervisor shall be notified and the device tagged.
- All visitors shall be authorized by the proper site representatives before entering or doing any work at the Site.
- Do not operate equipment for which you are not qualified.
- Horseplay or fighting on premises is prohibited.
- Smoking at the Site is not permitted except in designated areas, which must be approved by the NYCDEP Project Manager. Eating or drinking is prohibited in the work areas of the Site.
- The use, possession, transportation or sale of illegal drugs, alcoholic beverages, firearms, deadly weapons or explosives on the Site is prohibited.

- Use handrails and step one step at a time when ascending or descending stairs. Running is not allowed at the Site except in emergency.
- When lifting loads manually, use proper lifting techniques such as bending knees, obtaining assistance and mechanical lifting aids.
- Erect barricades around areas of hazardous work, such as work areas, trenches or overhead activities. Only the person in charge may grant permission for entry into these areas.
- Work platforms, approved scaffolding, ladders or safety harnesses shall be used if the work height is greater than 6 feet from ground level. Any high elevation (greater than 6 foot) work shall be done in a protected work platform with handrails, midrails, kick plates and flooring or the worker shall be protected from fall with a safety harness.
- All personnel, including visitors, and contractors and subcontractors, are required to wear hard hats and safety glasses with side shields while at the Site if overhead hazards exist.
- General footwear consisting of substantial shoes or boots with ANSI approved steel toes shall be worn at the Site. More protective footwear may be required in particular areas or for specific jobs.
- Hearing protection is required when the noise level exceeds 85 dBA.
- Use intrinsically safe and/or "spark-proof" equipment and tools while performing intrusive work in areas where potentially explosive levels of flammable gas may be present.
- If clothing becomes contaminated, the clothing shall be removed as soon as possible and potentially affected parts of the body thoroughly washed.
- Personal protective equipment shall be assigned and worn by personnel performing work requiring such equipment. Personal protective equipment shall be consistent with the Material Safety Data Sheets when handling hazardous materials.

- Use only proper tools and equipment maintained in good working condition.
- Fire extinguishers, alarm boxes, fire doors, eyewash stations, first aid kits and all other emergency equipment shall be in good condition, inspected regularly, and kept clear of obstructions.
- Operation of equipment having a "DANGER - DO NOT OPERATE" tag is prohibited.
- Under normal operations, all operating machinery and electrical switch gear shall have all required safety guards, switches and alarms in place and functional.
- When transferring flammable or combustible liquids into metal containers, the metal containers shall be grounded.

4.5 SAFETY STANDARDS

4.5.1 Hot Work

The following guidelines apply to maintenance or other tasks that are capable of producing a source of ignition and which are not directly connected with or controlled by normal operational activities. In general, hot work procedures are applicable to tasks involving sources of ignition and where flammable gas or vapor may exist.

Potential sources of ignition include, but are not limited to:

- Welding and cutting;
- Open flames;
- Hot tapping;
- Portable heaters;
- Internal combustion engines;
- Portable electrical tools;
- Grinding;
- Drilling;

- Chipping;
- Soldering;
- Excavators and other construction equipment;
- Sandblasting;
- Thawing frozen pipes; and,
- Freeing seized bearings.

The following general precautions should be followed, as appropriate, when performing hot work:

- Do not perform hot work unless absolutely necessary. Consideration should be given to relocating the work to a safe area whenever possible.
- Hot work shall be done under the supervision of persons who understand the fire and explosion potential. The hot work shall be performed by personnel sufficiently skilled to carry out the associated operations.
- Subcontracts should be made only with contractors who acknowledge understanding of hot work procedures and agree to have their employees abide by them. It is the responsibility of the OM&M Project Manager to maintain liaison with other contractors and subcontractors on all matters relating to fire prevention.
- Monitor the area with a combustible gas indicator before starting hot work and while work is in progress. Combustible gas indicators shall be properly calibrated using a suitable calibration gas prior to use.
- Keep fire extinguishers and other appropriate fire fighting equipment close by. If applicable, designate a person as firewatcher to extinguish small fires. The work area should be observed for at least 30 minutes after completion of the work to be sure that no hot spots remain.
- All bystanders shall be out of the area of exposure.

- Detailed planning is essential. The supervisor in charge should review the work to be done with personnel, describing pertinent safety and fire prevention measures to be taken.

Before allowing hot work to start, the supervisor in charge should verify that the following applicable conditions have been met, as appropriate:

- Piping connections have been blinded off or a section of pipe removed;
- Valves are tagged and locked out;
- Switches are tagged and locked out at breaker panel;
- Vessel or pipe are depressurized;
- Fire extinguishers are available;
- Fire watchers have been designated;
- Flammable gas tests have been made (additional tests shall be made while the work is in progress); and,
- Vessels or pipelines have been vented and/or steamed, and are free of flammable gas.

4.5.2 Lockout/Tagout

Scope

Lockout/Tagout procedures are required when an unexpected release of energy such as electrical, hydraulic, pneumatic or mechanical could potentially cause injury to personnel. Lockout/Tagout procedures should be designed to prevent the unexpected release of energy.

An initial evaluation shall be performed to identify potential exposures that shall be isolated before working on equipment and affected personnel appropriately notified.

These procedures do not apply to minor tool adjustments or servicing activities that are routine, repetitive and integral to operations.

Electrical Lockout/Tagout Procedures

Electrical lockout/tagout procedures shall be used before commencing any work requiring personnel to work on or near de-energized circuit parts or equipment in any situation where there is danger of injury due to unexpected energizing or startup of equipment.

- The person doing the work shall LOCK open the circuit breaker(s) or approved disconnect device(s).
- TAG the lockout with a dated and signed "DANGER-DO NOT OPERATE" tag. The reason for the lockout should be written on the tag.
- Other personnel working on this equipment shall attach their lock and tag.
- Each lock shall have only one key or a set of locks shall have one key. The key shall be held by the locking party until the job is completed.

- If a circuit cannot be locked out, it shall be de-energized and tagged. If the circuit requires disconnection or removal to ensure isolation, a qualified electrician shall perform the work.
- The equipment shall be tested at the on/off switch before beginning work after the locks are in place to confirm that the right circuit has been locked out.
- Only the person(s) originally attaching the lock and tag is authorized to remove the lock and tag unless the person(s) is not available to remove the lock and tag. UNDER THESE CONDITIONS THE SUPERVISOR, AFTER CHECKING THE EQUIPMENT AND ASSUMING FULL RESPONSIBILITY, CAN REMOVE THE LOCK AND TAG AND PLACE THE EQUIPMENT IN SERVICE. The supervisor is responsible for notifying personnel that their lock(s) and tag(s) have been removed.
- Personnel unlocking equipment to be energized are responsible for checking the work area to assure there is no hazard to personnel by starting/testing/re-energizing the equipment.

Process, Pneumatic and Hydraulic Lockout/Tagout Procedures

Process, pneumatic and hydraulic lockout/tagout procedures shall be used before commencing any work requiring personnel to work on or near any energy sources (e.g., process, hydraulic or pneumatic fluids, or thermal or chemical systems) where there is danger of injury due to the unexpected start-up of equipment.

The procedures for process, hydraulic and pneumatic lockout are essentially the same as the procedures for electrical lockout/tagout; the primary difference is in means of isolation.

Acceptable means of isolation (in order of preference) are as follows:

1. Blinding
2. Disconnection
3. Double block and bleed

4. Single block valve (valve shall be locked closed)
 - Valve shall not leak or have history of leaking
 - Not acceptable for:
 - High toxics;
 - High pressure;
 - Vessel entry; or,
 - Piping which shall be open for extended periods of time.

Mechanical Energy Lockout/Tagout Procedures

- If springs are involved, they shall be released or physically restrained when necessary to immobilize mechanical equipment.
- The use of brakes is not an acceptable means of energy isolation. The use of blocks or chains in addition to the brake is required.

Review

At least annually, a documented review of all lockout/tagout procedures for the Site shall be conducted.

At a minimum, this review shall include:

- Identification of the equipment to which the procedure applies;
- The date of the review;
- A list of the employees reviewed; and,
- The name of the supervisor conducting the review.

4.5.3 Confined Space Entry

This procedure establishes guidelines for preparation, entry and restoration of a confined space to be entered by personnel. These procedures are designed to maintain a safe environment for personnel working in a confined space. All work shall be performed in accordance with OSHA Regulations 29 CFR 1910.146, the Confined Space Standard, and all local regulations. Designation of confined spaces as either Permit Required Confined Spaces or Non-Permit Confined Spaces, and the determination of actual entry and emergency response procedures, is solely the responsibility of the OM&M Contractor in consultation with the DEP Project Manager..

Scope

This procedure applies to excavations greater than 4 feet deep and to any confined space that is large enough to be entered bodily and has one or more of the following characteristics:

- Has limited or restricted openings for entry or exit;
- Contains or has a potential to contain a hazardous atmosphere;
- Is not intended for continuous occupation;
- Has insufficient natural ventilation; or,
- May contain known or potential hazards.

Confined spaces include, but are not limited to, storage tanks, frac tanks, tank trucks, process vessels, furnace boxes, sewer systems, ducts, flues, manholes, valve boxes, cellars, pipelines, pits, excavations or other areas that may contain toxic, corrosive, flammable, oxygen deficient or oxygen rich atmospheres.

Entry is defined as when any part of the entrant's head breaks the plane of an opening into a confined space.

Guidelines

The following guidelines are designed to assist the OM&M Contractor in confined space entry work. As previously stated, determination of actual entry and emergency response procedures is solely the responsibility of the OM&M Contractor. These guidelines have been developed primarily for entry into Permit Required Confined Spaces. The OM&M Contractor is required to determine which of these guidelines pertain to entry into Non-Permit Confined Spaces.

Pre-Entry Procedure Guidelines

1. The space shall first be isolated using the following techniques, as appropriate:

- Blinding of lines as near the space as possible;
- Disconnecting of lines as near the space as possible; and,
- Double blocking and bleeding water and other non-hazardous lines.

A sketch of the space must be provided identifying the isolation and the technique used to achieve isolation. EVERY LINE MUST BE ISOLATED.

2. All electrical sources to the space shall be locked out using the procedures outlined in the Electrical Lockout/Tagout Procedures.
3. The confined space shall be cleared to remove vapors and contaminants.
4. Ventilation shall be established and maintained to ensure movement of fresh air in the confined space.
5. The atmosphere in the confined space shall be evaluated, as necessary, for the following:
 - Oxygen > 19.5 and < 23 percent
 - Flammable gases or vapors < 10 percent LEL
 - Toxic vapors - as necessary

- Carbon monoxide < 5.0 ppm
- Hydrogen sulfide < 1.0 ppm
- Organic vapors < 25.0 ppm
- Benzene < 1.0 ppm
- Vinyl chloride < 1.0 ppm

The OM&M Contractor is responsible for reviewing these levels for conformance with applicable standards at the time the work is actually performed. Calibrated instruments shall be used to make these evaluations.

The Site Safety Officer shall determine which chemicals should be measured in each particular confined space.

6. At least one properly trained and equipped "stand-by" person shall be posted outside the confined space. This stand-by person's job is to maintain communication with workers in the confined space and to summon help should it be required. This person shall not enter the confined space.
7. The need for a self-contained breathing apparatus or equivalent supplied air system shall be assessed by the Site Safety Officer. If determined to be necessary, it shall be positioned, in complete working condition, outside the confined space.
8. Lifelines, harnesses, wristlets or other appropriate retrieval equipment shall be worn by entrants. A mechanical retrieving device shall be made available for vertical spaces more than 5 feet deep.
9. Equipment such as air movers and vacuum truck hoses shall be properly grounded to prevent static sparks. Any electrical equipment used in the confined space should either be 12 volt DC or 120 VAC with ground fault interrupter.
10. Personal protective equipment such as coveralls, gloves, boots, safety glasses and hard hats shall be provided.

11. Personnel trained in first aid and CPR shall be available at the Site.
12. Appropriately sized fire extinguishers and other fire fighting equipment, if necessary, shall be available.
13. A communication system shall be established between the stand-by person, the entrants and site security personnel.
14. Signs and/or barricades shall be posted outside the confined space.
15. Entrants and standby persons shall be trained and familiar with the following:
 - Assigned duties;
 - Any hazardous material which may be present;
 - Reserve equipment;
 - Procedures and emergency contacts;
 - Communication systems; and,
 - Personal protective equipment.
16. Rescue services and the method of communicating with rescue services shall be listed on the permit.
17. A pre-entry safety meeting shall be held to discuss all the above items including the specific confined space to be entered.

Entry Procedure Guidelines

1. Entry may be made after all the items in Section 4.5.3 are completed and a Confined Space Entry Permit has been signed and issued
2. The stand-by person shall remain in the stand-by position unless adequately relieved. Unauthorized persons shall not be allowed entry.
3. The atmosphere inside the confined space shall be continuously monitored and readings periodically recorded on the permit. If hot work is required in the confined space, a separate "Hot Work Permit" shall be issued.

4.6 ELECTRICAL SAFETY

The following electrical safety requirements shall be reviewed, implemented and strictly adhered to by all workers, as appropriate:

- Only qualified and trained personnel are allowed to repair or install electrical equipment.
- All conductors are considered to be energized.
- First aid and CPR trained people shall always be present at the Site when electrical work is being performed.
- All circuits shall be de-energized before beginning work. Refer to Lockout/Tagout, Section 4.5.2, for details of how to execute the lockout/tagout.
- Use suitable personal protective equipment including rubber gloves, mats and blankets to provide insulation from other elements which are energized or grounded. Rings, watches or other metallic objects shall not be worn while working on electrical equipment.
- Blown fuses shall be replaced only with the proper type and rating.

- Use of metal ladders is prohibited while working on or near electrical equipment or conductors.
- Defective electrical equipment should never be used.
- The use of field electrical equipment outdoors requires a GFI outlet.
- All power lines shall be considered energized unless proper measures have been taken for de-energizing overhead power lines. Any part of a crane, booms or other machinery shall not be permitted within 20 feet of power lines.

4.7 EMERGENCY PROCEDURES

4.7.1 General

Emergency procedures shall be available for emergency situations that could occur. Examples of situations requiring emergency procedures are fire, explosion, injury, spills of hazardous materials, toxic or combustible gas releases, or moving equipment accidents.

The OM&M Project Manager is responsible that emergency procedures are available for emergency situations that may arise during operations at the Site.

All specific emergency procedures shall contain the following common elements:

- Internal/external communication;
- Accountability for all employees; and,
- Rescue procedures.

4.7.2 Training Requirements

Site personnel shall be thoroughly trained as follows:

- Drills of the emergency plan shall be performed every six months. Each drill execution shall be followed by a critique and a written report distributed to the OM&M Project Manager, the Project Health and Safety Officer, and the NYCDEP Project Manager;
- Preparation of chain-of-custody forms;
- Response to medical, fire or other emergencies;
- Evacuation routes; and,
- Location and use of emergency equipment.

4.7.3 Site Communications

A site communication system shall be established to warn all Site personnel if an emergency occurs. This system shall communicate the essentials needed for those individuals to protect themselves in an emergency. In addition, the communication system shall be able to effectively notify all the required outside entities should an emergency occur.

Specific emergency procedures shall be developed for the following:

- Fire/explosion;
- Medical emergency;
- Confined space entry rescue;
- Toxic/flammable release to atmosphere; and,
- Spills of hazardous material.

4.8 COMPRESSED GAS CYLINDERS

4.8.1 General Safety Procedures

- Do not move or store cylinders without the protective cap over the valve.
- Move cylinders with a cart or carrier for cylinders and get help as necessary.
- Cylinders moved by a crane or derrick shall be secured in a basket. Use of slings, ropes or electromagnets is prohibited.
- Cylinders should not be allowed to strike each other and should only be used to contain gas.
- Threads on a regulator or fitting shall correspond to those on the cylinder valve outlet.
- Always use a pressure-reducing regulator on a cylinder unless the total system being discharged to is capable of handling the cylinder pressure.
- Never use oil or grease as a lubricant on valves or attachments to oxygen cylinders.

4.8.2 Storage of Cylinders

- Properly secure cylinders with chains, brackets or ropes to prevent falling.
- Do not store oxygen cylinders within 20 feet of combustible gas cylinders. Adjacent storage can be accomplished provided a 5-foot or higher wall separates the cylinders and the wall has a fire rating of 30 minutes or more.
- Store cylinders in a safe, dry, well-ventilated area.
- Store empty and full cylinders separately and identify each as "full" or "empty".

4.9 INDUSTRIAL HYGIENE PROCEDURES

The objectives of these procedures are as follows:

- Protect the health of personnel and the public;
- Identify chemical stresses, physical and biological agents, and ergonomic hazards which can lead to occupational illnesses; and,
- Implement controls that prevent or minimize potential personnel exposures and/or illness.

Potential hazards at the Site shall be identified and evaluated and the following concerns addressed:

- A comprehensive and historical inventory of all potential chemical, physical and biological agents shall be developed and updated regularly.
- Potential exposures shall be identified by determining the chemicals that an individual may come in contact with, by job tasks and work practices.
- Potential exposures shall be evaluated by performance of industrial hygiene surveys.
- Exposure levels shall be communicated to all personnel.
- Recommendations for lowering exposures to acceptable levels shall be addressed and action plans developed for implementation.
- Proper toilets and clean break areas shall be provided for personnel working at the Site. A functioning shower shall be provided.

Individual monitoring and exposure records shall be maintained by the Site Safety Officer and made available to all employees.

4.10 HAZARD COMMUNICATION POLICY

4.10.1 General Policy

NYCDEP is committed to informing all employees of hazardous substances present in their places of work in accordance with the OSHA Hazard Communication (HAZCOM) requirements (OSHA Regulations 29 CFR 1920.1200 and 29 CFR 1926.59). This program applies to all work operations where workers may be exposed to hazardous substances.

Under the HAZCOM program, personnel working at the Site shall be informed by the OM&M Contractor of the contents of the HAZCOM Regulations, the hazardous properties of chemicals with which they work, and safe handling procedures and measures to protect themselves from these chemicals.

4.10.2 Material Safety Data Sheets and Chemical Hazard Information

Material Safety Data Sheets (MSDS) provide specific information on the chemicals to which personnel working at the Site may be exposed. The MSDS should be a fully completed OSHA Form 174 or equivalent. Every effort shall be made by the OM&M Contractor to obtain all pertinent MSDS or similar chemical hazard information whenever chemical exposure of personnel is possible.

The OM&M Project Manager is responsible for acquiring and updating MSDS for chemicals present at the Site.

4.10.3 Labels and Other Forms of Warning

Hazardous chemicals used by personnel working at the Site shall be properly labeled. Original labels shall list the chemical's identity, appropriate hazard warnings, and the name and address of the manufacturer. Reference shall be made to the corresponding MSDS to assist in verifying label information. Original labels shall not be defaced or removed.

If chemicals are transferred from a labeled container to a portable container that is intended only for immediate use, no labels are required on the portable container. However, no hazardous materials or chemicals should be permanently used or stored in unlabeled containers.

4.10.4 Training

All personnel who work with or who are potentially exposed to hazardous chemicals shall receive training on the Hazard Communication Standard requirements and the safe use of those chemicals.

Site personnel who are potentially exposed to hazardous chemicals or contaminated samples shall be trained in:

- The basic requirements of HAZCOM Regulations and employees' right to information on chemical hazards.
- The OM&M Contractor's program to comply with HAZCOM requirements and procedures that must be followed, including reviewing the standard requirements, the company program, and MSDS recordkeeping procedures.
- How to interpret and use the labels on containers of hazardous materials.
- The potential physical hazards and health effects of the hazardous substances and how to use MSDS for more information.
- Methods and observations that may be used to detect the presence or release of chemicals.
- The measures that employees can take to protect themselves from chemicals.

All HAZCOM training shall be documented by a sign-in sheet recording each employee's attendance, the date, and the training topics covered. This sign-in sheet shall be retained by the Project Health and Safety Officer. Such training can be performed by any of the following individuals:

- OM&M Project Manager;
- Project Health and Safety Officer; or,
- Site Safety Officer.

The implementation of the Hazard Communication Program shall be under the general direction of a Certified Industrial Hygienist.

4.10.5 Protective Measures

The use of chemical splash goggles, gloves, protective clothing, boots and, possibly, respiratory protection may be required during collection of potentially contaminated samples or the handling of hazardous chemicals. If respiratory protection is used, it shall be in full compliance with OSHA Regulations 29 CFR 1910.134 and 29 CFR 1926.103. All personal protective equipment used shall be in accordance with Subpart I of OSHA Regulations 29 CFR 1910 and Subpart E of OSHA Regulations 29 CFR 1926. Any emergencies involving hazardous chemicals or potentially contaminated samples shall be reported immediately to the OM&M Project Manager, the Project Health and Safety Officer, and the NYCDEP Project Manager; and other designated personnel, as necessary, required by the NYC Response Plan.

4.11 INCIDENT/ACCIDENT INVESTIGATION PROCEDURE

The objectives of accident investigations are to determine the immediate and underlying causes of accidents and to recommend corrective actions to prevent similar incidents/accidents from occurring.

For purposes of this procedure, an accident/incident is defined as follows:

- Illness resulting from chemical exposure;
- Physical injury to personnel;
- Fire, explosion or flash from the Site;
- Property damage to the Site;
- Infractions of safety rules;

- Unexpected chemical releases or exposures; or,
- Complaints from neighbors concerning any part of the site operation.

The above list is not intended to be all-inclusive but gives examples of accidents/incidents, which are covered by this procedure.

A Health and Safety Incident Report shall be forwarded in writing for incidents and accidents. The incident/accident shall be investigated by the Site Safety Officer and OM&M Project Manager within 12 hours of occurrence. At the discretion of the OM&M Project Manager and the Site Safety Officer, additional resources may be utilized to accomplish a successful accident investigation. Recommendations to prevent the accident in the future shall be included in the accident investigation report; copies of all pertinent documents must be provided to the NYCDEP Project Manager within 24 hours of the incident/accident.

REMEMBER: ACCIDENT INVESTIGATIONS GO BEYOND ASSESSING BLAME. IT IS IMPORTANT TO DETERMINE THE ROOT CAUSES OF ACCIDENT/INCIDENTS.

4.12 HEALTH AND SAFETY PLAN

In accordance with the requirements of OSHA Regulations including 29 CFR 1910.120 (Hazardous Waste Operations and Emergency Response) and local regulations, based on an evaluation by the OM&M Contractor of the nature of the project, the work activities to be performed, and the hazards at the Site, a site-specific Health and Safety Plan and/or Emergency Response Plan must be prepared by the OM&M Contractor. All HASPs necessary for work activities at the Site must be provided to the NYCDEP for review a minimum of two weeks prior to the start of these work activities. This review by the NYCDEP does not constitute approval of the HASP or relieve the OM&M Contractor of any health and safety responsibilities. A copy of the current HASP is found in Section 9.

DOCUMENTATION AND REPORTING

The OM&M Contractor shall employ procedures to monitor operation and maintenance, including a program of recordkeeping, and reporting. The procedures are discussed in the following sections. Documentation refers to all printed and mechanical media produced, copied, or other information taken by the OM&M Contractor to support visual observations and provide evidence of proper operation and maintenance of the site. The OM&M Contractor shall only record information collected during inspections in the following types of records: field notebooks, checklists, photographs, maps, and drawings. Recording information on other loose papers is discouraged; loose papers may be easily misplaced. The OM&M Contractor and his/her staff shall keep detailed records of inspections, investigations, and photographs taken. Notes shall be reviewed for accuracy before leaving the Site.

Each document shall be listed in a project document inventory which will be maintained for the project. Water-proof ink shall be used to record all field data on the documents. Red pencil marks shall be used to update the field copy of the record drawings. The final record drawing documents showing composite information shall be drafted in ink.

5.1 FIELD NOTEBOOK

The OM&M Contractor site representatives shall maintain legible field notebooks containing accurate and inclusive documentation of inspection activities and observations. Documentation shall include, but not be limited to, operating conditions, monitoring results, analytical test results, maintenance work, weather conditions, and emergency situations. The field notebook shall also include notations on weather conditions and the times that changes in the weather occur, photograph points, and descriptions of areas of potential problems. The field notebook shall contain facts and observations used as the basis for later written reports. Notebooks used for recording field notes shall be bound and have consecutively numbered pages.

5.2 CHECKLISTS

Checklists shall be used in conjunction with the field notebook to record inspection observations. The checklists for inspection of the various components of the landfill are included in Appendix A of Volume III of the OM&M Manual. The checklists are to be used as a tool for organizing, conducting, and recording the results of an inspection. The purpose and scope of an inspection is not limited to the items on a checklist; the checklists shall be used as guidance. Comments or observations recorded on checklists need not be duplicated in the field notebook. Checklists shall be entered into bound notebooks as permanent records to be maintained by the OM&M Contractor for the duration of the Contract. They shall be organized by date.

5.3 LABORATORY RECORDS

Analytical records for on-site laboratory tests shall be entered into bound notebooks to be maintained by the OM&M Contractor for the duration of the contract. In addition, the OM&M Contractor shall prepare and submit reports on environmental monitoring and laboratory testing to the NYCDEP within one month of the receipt of monitoring results.

5.4 PHOTOGRAPHS

Photographs shall be used to provide documentation of the OM&M Contractor's observations of problems or deficiencies in the systems. Documentation with photographs is important in validating an existing situation. For each photograph taken, the following items shall be entered in the OM&M Inspector's field notebook and later transferred to the back of the photograph:

1. Date
2. Time
3. Photographed by (initials)
4. General direction faced by inspector when taking photograph
5. Location and description of photograph (e.g., heavy erosion near baffled outlet B04)
6. Other comments (e.g. weather conditions)

The type of camera used by the OM&M Contractor is optional; however 35 mm single lens reflex cameras are most common. When taking photos, the OM&M Contractor shall include in the photograph a ruler or other item, as appropriate, which helps to show the scale of the object photographed.

5.5 MAPS AND DRAWINGS

Schematic maps, drawings, charts, and other graphic records shall be used to document areas requiring special maintenance (i.e. severely eroded areas). Maps and drawings shall be free of extraneous details. Basic measurements shall be included to provide a scale for interpretation, and compass points shall be included. Shop drawings shall be provided for any changes to the plumbing and electrical or mechanical features of the project. As-built record drawings shall be provided to document any realignment of piping systems, areas of major regrading or cover system repair, well installation or abandonment or other changes to the project.

5.6 REPAIR LOGS

The OM&M Contractor may use maintenance repair logs in conjunction with the field notebook and inspection checklists to record required repairs. The repair may be used as a tool for organizing, conducting, and recording the results of repairs that are beyond normal and expected maintenance listed in Volume III, Appendix B. The comments or observations on the repair logs can be supplemented in the field notebook when there is need for additional room for explanations, sketches, etc. to expand upon information on the repair logs.

5.7 REPORTING REQUIREMENTS

The OM&M Contractor shall prepare a monthly, annual, and five-year Report and Assessment of Site Operations for submission to the NYCDEP. These reports are described in Section 7 of this volume.

EMERGENCIES AND CONTINGENCY PLAN

6.1 GENERAL**6.1.1 Emergencies**

The OM&M Contractor shall prepare an Emergency Response Plan as part of the Health and Safety Plan described in Section 4.0 that addresses emergency situations. This plan shall be kept in a prominent, readily accessible place in the OM&M Contractor's trailer. It is the responsibility of the OM&M Contractor to familiarize his employees, subcontractors and other personnel involved in the on-site Operations, Maintenance and Monitoring with the Emergency Response Plan and Procedures. Incidents/Emergencies that are to be addressed by the Emergency Response Plan shall include, but not be limited to the following:

- Toxic substance exposure
- Fire/Explosion
- Hazardous material spill
- Personnel injury

In the event that a life threatening emergency occurs, the OM&M Contractor is responsible that his/her personnel and subcontractors follow the Contractor's Emergency Response Plans and Procedures.

6.1.2 Contingencies

Other situations may occur at the Site that will require corrective actions to be implemented in an expedited manner (i.e., contingencies). Not all potential situations of this nature can be foreseen or described here. Some of the situations include, but are not limited to, the following:

- Gas system shut down
- Leachate tank overflow
- Excessive Settlement of Cap
- High leachate level along the cutoff wall
- Power failure for an extended period of time
- Broken Force Main
- Sideslope failure
- Stormwater system failure
- Seepage from side slopes

In most instances, the five-step process, outlined below, shall be followed. For the contingency situations listed above, the instructions outlined in Section 6.3 shall be performed immediately to prevent further complications before an appropriate corrective action is implemented.

6.2 CORRECTIVE ACTION PROCESS

The OM&M Contractor shall take the following steps to resolve contingency problems:

1. Identify/verify the problem and its cause. If possible, the OM&M Contractor shall make a preliminary assessment of the severity of the problem. Immediate steps shall be taken to contain the problem, if necessary.
2. Notify the proper authorities depending on the severity of the problem. At a minimum, the OM&M Project Manager shall be notified, who, in turn, shall inform the NYCDEP Project Manager. The NYSDEC shall be notified of any of the contingency items listed in Section 6.1. The OM&M Project Manager shall initiate a decision-making process for a course of action. Appropriate local/state/federal agencies shall also be contacted, as necessary. Emergency telephone numbers are included in Table 6-1.

3. Make recommendations to the NYCDEP, as appropriate, for corrective actions and a schedule for implementation. If necessary, a more detailed assessment of the problem and evaluation of alternatives for corrective action shall be undertaken by the OM&M Contractor, subject to the approvals of the NYCDEP.
4. Obtain authorization from the NYCDEP for the OM&M Contractor to implement any corrective action(s).
5. Implement a proper, safe and effective corrective action by the OM&M Contractor at the direction of the NYCDEP.

6.3 CONTINGENCY PROCEDURES

The following instructions shall be followed for the contingency situations listed in Section 6.1.

6.3.1 Gas System Shutdown

A potential hazardous situation exists if the active gas extraction system is shut down or not operating properly. This can occur if the blowers are turned off, the flare is extinguished, or the gas header system becomes plugged.

In the event the active gas system is not drawing gas to the flare, gas can build up beneath the geomembrane liner. After a period of time, the gas pressures may be enough to lift portions of the liner and soil cover. This can potentially lead to slope instability, a ruptured liner or other serious problems. However, venting the landfill gas is not recommended since oxygen could be introduced into the landfill, increasing the possibility of a fire.

In the event the active gas system is not drawing gas to the flare, the following action should be taken:

- Restart the gas blowers and flare following the instructions in Volume III, Section 5.

If the blowers and flare do not restart

- Notify NYCDEP of the situation within 4 hours.
- Contact a representative of the John Zink Co. or other qualified company to examine the system.
- Repair or replace blowers as necessary.
- Repair flare as necessary.
- Repair flare control system as necessary.
- Bring blowers and system back on-line as soon as possible.

When blowers and flare systems are brought on-line, the passive gas vents and gas extraction wells must be sealed to avoid pulling oxygen into the system. Immediately after the flare system is running, check all gas extraction wells for vacuum pressure readings. If vacuum is not recorded at each well head, check that all valves are properly set. The piping system shall also be checked for blockages or condensate filling the lines. This shall be done by identifying the potential gas lines that could be plugged (based on the problematic well heads). Field check the gas header pipe alignment for settlement or indications of low spots that could be trapping condensate.

If low spots are identified, regrade area and reset gas collection piping to drain. Close valves to the lines being repaired and observe proper Health and Safety guidelines when performing work on any gas lines to avoid flammable or explosive conditions.

6.3.2 Leachate Tank Overflow

The leachate holding tank may overflow if, for example, the level controller in the leachate tank fails to shut off the well pump when the leachate tank reaches its high level. The following initial steps shall be taken in response to a leachate tank overflow:

- Cease operation of all pumps.
- Assess the extent of the leachate tank overflow and contamination of the area around the tank.
- Identify possible cause(s) of overflow and corrective actions that may be necessary.

- Assess the need to set up emergency hauling in coordination with the NYCDEP.
- Set up emergency hauling of the leachate from the tank if so directed by the NYCDEP.
- Implement emergency remediation procedures if so directed by the NYCDEP.
- Implement procedures to correct the cause of the tank overflow.

6.3.3 Excessive Settlement of Cap

In the event of severe differential settlement of the cap, the following steps should be taken:

- Modify, cancel or delay all activities (e.g., mowing, fertilizer application, monitoring, etc.) in the immediate vicinity of the settlement.
- Initiate the Corrective Action process described in Section 6.2.

6.3.4 Sideslope Failure

In the event of a sideslope failure, immediately notify NYCDEP and follow the Corrective Action Process in Section 6.2. Document the sideslope failure both with photographs and location markings on the record drawings. Design modifications may be warranted to avoid a repeat of the failure. Identify the cause and suitable remedy prior to repairing the slope. In the interim, take temporary measures to reinstate the stormwater collection system across the failed slope. The slope should be remediated in a timely fashion to avoid other problems (i.e. refuse exposure or erosion that are related to unprotected slopes).

6.3.5 Stormwater System Failure

Stormwater system failures may be caused by many factors. For example, stormwater connection piping, pond connection piping or inlet/outlet structures could be clogged. A precipitation event exceeding the design capacity (about 6" of rainfall in 24 hours) could have occurred. Frozen water may have blocked part of the conveyance systems during snow melt. Inspect and repair any blockages or failed stormwater piping and repair.

The OM&M Contractor shall contact the NYCDEP and follow the Corrective Action Process in Section 6.2.

6.3.6 Seepage from Sideslopes

Any water seeping from the sideslopes is a serious condition. The saturated conditions and erosion from seeps can eventually lead to progressive slope failure. Seepage from side slopes may indicate an accumulation of leachate beneath the cover and a failure in the geomembrane liner. Seeps represent an escape of contamination from the landfill containment and are of environmental concern. More likely a seep will be caused by infiltration surface water building up over the geomembrane and saturating the sideslope.

Inspect the area for the source of the seepage and hand excavate to the geocomposite surface.

Check the water quality of the samples of the seepage by performing an analysis similar to that for groundwater samples (See Volume III, Section 4.0).

If the seepage is not leachate, there is probably a blockage of the infiltration drainage trench; 6" diameter HDPE corrugated slotted piping or geocomposite. Excavate and remove the geocomposite along the slope in the saturated area down to and including the infiltration drainage trench at the base of the slope. Check and repair or replace the HDPE geomembrane if damaged. Use like materials and replace all geocomposites and cover soils in accordance with the requirements of the record drawings and specifications for Contract HP-876.

If the seepage is leachate, contact the NYCDEP and follow the Corrective Action Process in Section 6.2.

6.3.7 High Leachate Levels Along Cutoff Wall

A high level of leachate along the cutoff wall may indicate that the downgradient drain is not functioning properly. The high level of leachate could cause leachate to migrate laterally around the cutoff wall, primarily towards Pelham Bay Park and Eastchester Bay. If leachate levels reach elevation 5.0, it can cause uplift at the base of Sedimentation Pond A and create a risk of contaminating stormwater.

The following initial steps shall be taken in response to high leachate levels along the cutoff wall:

- Notify NYCDEP
- Check that all pumps in Containment Sumps D-1, D-8, and D-10 are operational. Repair as necessary.
- Check that Lift Station No. 2 pumps are operational.
- Check that leachate is flowing through the downgradient drain to Collection Sumps D-1, D-8 and D-10 and to Manholes D-2 through D-7 and D-9.
- If leachate is not flowing to these manholes, the drain pipes may have become plugged and should be cleaned using high pressure pipe cleaning equipment.
- Repair sections of downgradient drain that are damaged or cannot be unplugged. Repair in accordance with record drawings and specifications for Contract HP-875.
- Follow the Corrective Action Process in Section 6.2.

6.3.8 Broken Force Main

A broken force main carrying leachate can create a potential environmental release. A broken force main may be identified by loss of pressure in force main pumps or by evidence of settlement or erosion on the surface above the force main. Immediately notify NYCDEP of any force main break and shut down pumps to the force main. Locate the break. Repair the break with like materials and test piping in accordance with the record drawings and specifications for Contract HP-875 or HP-877, as appropriate. Remove all contaminated materials and dispose of off-site at a disposal facility approved by the NYCDEP.

6.3.9 Power Failure for an Extended Period of Time

If power failure is expected for an extended period of time, contact the NYCDEP and Con Edison. Mobilize portable generating units to provide temporary power to the gas collection and flaring control systems. Hook up to the automatic transfer switch should be provided by a qualified electrician. Inspect operations on a daily basis while temporary generators are supplying power to the control systems. Keep generators properly fueled and lubricated for continued operation until permanent power is restored.

6.4 EMERGENCY CONTACTS

Table 6-1 lists telephone numbers for emergency contacts. In the event of an emergency, the telephone at the site can be used.

6.5 DIRECTIONS TO THE JACOBI MEDICAL CENTER

In case of an emergency, the OM&M Contractor should be aware of the proper evacuation and/or medical treatment procedures outlined in the site specific Health and Safety Plan. In the event of a medical emergency, the route to Jacobi Medical Center is detailed below:

- Exit site and get onto Shore Road (Pelham Parkway) southbound.
- Continue southbound on Pelham Parkway; exit onto Wilson Avenue (southbound) left after about 1.25 miles.
- Jacobi Medical Center will be on the left hand side; enter at Emergency Room entrance off of Wilson Avenue.

A map of the route to Jacobi Medical Center from the Site is provided in Figure 6-1. All OM&M field personnel should be familiar with the route to be followed to the Hospital in case of the occurrence of any medical emergency.

6.3.9 Power Failure for an Extended Period of Time

If power failure is expected for an extended period of time, contact the NYCDEP and Con Edison. Mobilize portable generating units to provide temporary power to the gas collection and flaring control systems. Hook up to the automatic transfer switch should be provided by a qualified electrician. Inspect operations on a daily basis while temporary generators are supplying power to the control systems. Keep generators properly fueled and lubricated for continued operation until permanent power is restored.

6.4 EMERGENCY CONTACTS

Table 6-1 lists telephone numbers for emergency contacts. In the event of an emergency, the telephone at the site can be used.

6.5 DIRECTIONS TO THE JACOBI MEDICAL CENTER

In case of an emergency, the OM&M Contractor should be aware of the proper evacuation and/or medical treatment procedures outlined in the site specific Health and Safety Plan. In the event of a medical emergency, the route to Jacobi Medical Center at 1400 Pelham Parkway S., Bronx, NY (718-918-5000) is detailed below:

- Exit site and get onto Shore Road (Pelham Parkway) southbound.
- Continue on Pelham Parkway W.; left onto Williamsbridge Road.
- Turn left onto Pelham Parkway S.
- Jacobi Medical Center will be on the left hand side.

A map of the route to Jacobi Medical Center from the Site is provided in Figure 6-1. All OM&M field personnel should be familiar with the route to be followed to the Hospital in case of the occurrence of any medical emergency.



[Send To Printer](#) [Back to Map](#)

1400 Pelham Pkwy S
Bronx NY
10461-1138 US


Notes:

.....

.....

.....

.....



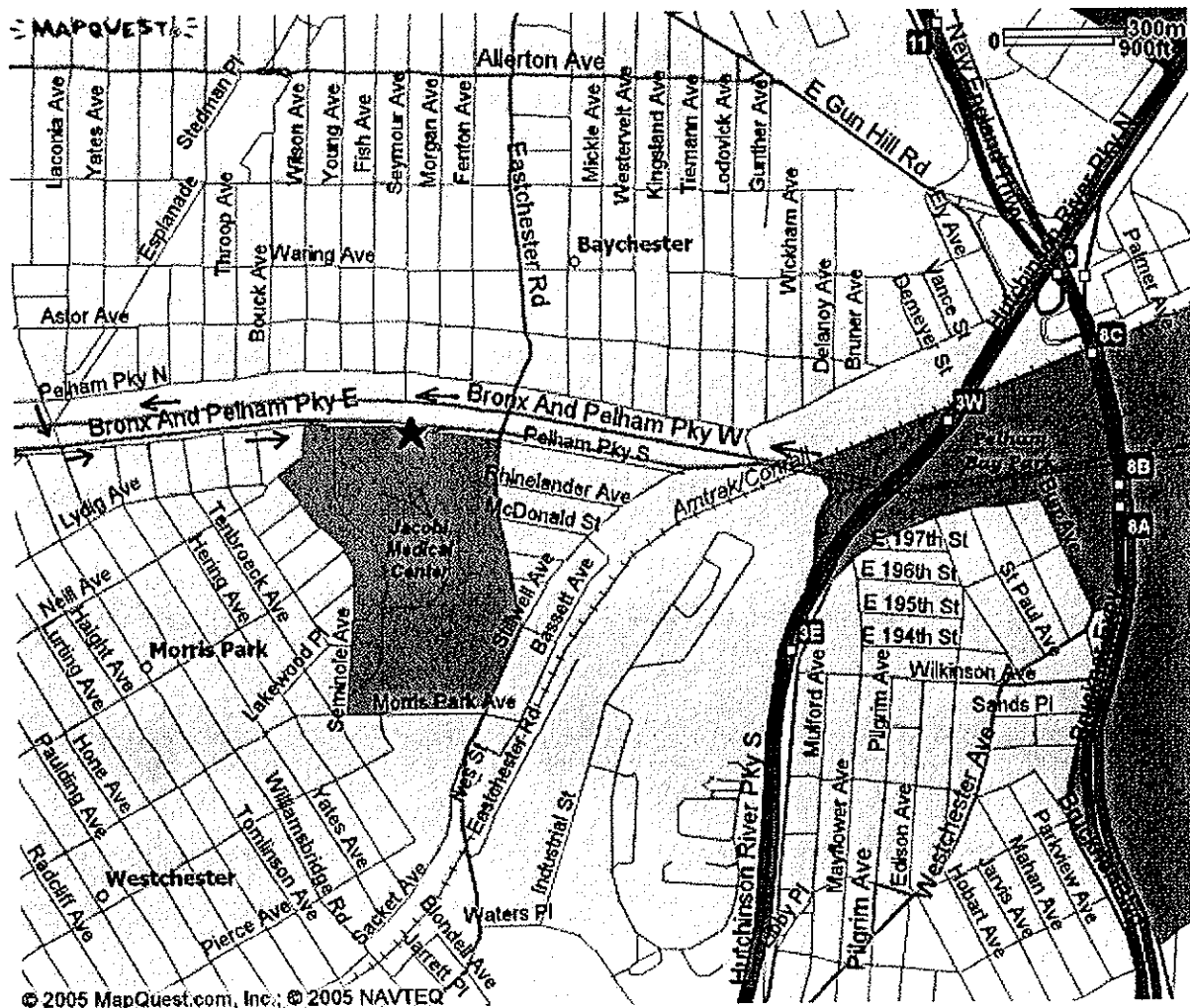
**Hilton
Garden Inn®**



Our guests have honored us with the J.D. Power and Associates award three years running.

Get to know us:

Select a destination



© 2005 MapQuest.com, Inc.; © 2005 NAVTEQ



All rights reserved. Use Subject to License/Copyright | [Map Legend](#)

This map is informational only. No representation is made or warranty given as to its content. User assumes all risk of use. MapQuest and its suppliers assume no responsibility for any loss or delay resulting from such use.

FIGURE 6

7.1 REPORT FORMATS

All OM&M reports prepared for NYSDEC will be written reports of findings or an equivalent, in electronic format (i.e., compact computer disk) acceptable to the NYSDEC.

7.1.1 Monthly Reports:

The OM&M contractor will prepare reports for the NYSDEC, and NYCDEP will review them. The NYCDEP will submit monthly reports within 45 days of each specified reporting period. The monthly report should include the following:

1. The NYSDEC site identification number, 203001, plus the municipality and the county, in the title of the report.
2. A description of the performance of the treatment systems such as the flare and the leachate force-main. This includes:
 - The percentage of time the system was run for the reporting period
 - The gallons or cubic feet (as appropriate) processed for the time period and the cumulative total for this process
 - The high and low flows per day, if possible, or other available information that reflects quantities and rates.
3. A map showing sampling well locations, and significant analytical values at sampling locations. This will only include compounds with exceedances along with applicable standards.
4. A description of information derived from routine maintenance and inspection forms.
5. A description of breakdowns and /or repairs along with an explanation for any significant downtime.
6. Comments, conclusions and recommendations based on an evaluation and potential resolution of performance problems.

Monthly reports are provided by the OM&M contractor and detail activities, results, and problems identified for the reporting month. A copy of this report will be provided to NYSDEC for review.

The reports can include information derived from the following sources along with others:

- Monthly Inspection Checklist – Miscellaneous Systems (Form MS-1 Vol. III Sec.8)
- Monitoring Wells and Points (Table 6-1 Vol. III. Sec.6)
- Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) (Table H-1 App. H Vol. III)
- Inorganic Target Analyte List (TAL) Contract Required Detection Limit (Table H-2 App. H Vol. III)
- Groundwater Elevation Log Sheets (See Table I-1 App. I Vol. III)
- Sampling Event Log Sheets that monitor groundwater samples, surface water samples and leachate samples. (See Table I-3 App. I Vol. III)
- Groundwater Sampling Log Sheets (Table I-4 App. I Vol. III)
- Environmental laboratory analysis of the monitoring wells (See Table I-5 App. I Vol. III)
- Inspection and Preventive Maintenance Groundwater/Leachate Management System Table GWL-1 (App B Vol. III)
- Health and Safety Incident Reports (Figure 4-3 Vol. I Sec 4.)

Inspection Checklists

- Form GWL-1 - Groundwater/Leachate Management System
- Form LFG-1 - Landfill Gas Management System
- Monthly Inspection Cover Sheet
- Form FCS-1 - Final Cover System
- Form SMS-1 - Stormwater Management System - Stormwater Drainage Ditches
- Form SMS-2 - Stormwater Management System - Manholes and Baffled Outlets
- Form SMS-3 - Stormwater Management System - Sedimentation Ponds
- Form GWL-2 - Groundwater/Leachate Management System, Manholes and Sumps
- Form LFG-2 - Landfill Gas Management System

- Form AS-1 - Ancillary Systems
- Form GWL-3 - Groundwater/Leachate Management System
- Form LFG-3 - Gas Collection System Belowground Piping
- Form DP-1 Description of Deficiencies and Problem

7.1.2 Annual Reports:

Information is provided in the yearly report from detailed results summarized from data gathered from the monthly reports, with a goal to identify trends. In coordination with DEC, statistical analysis for comparison purposes with prior year data may be included. The annual report summarizes all of the monitoring reports and documents the results, conclusions and recommendations of the project. The report will be submitted within 90 days of the final sampling event of the year. The annual report must include all the requirements for an interim monitoring report as well as the following:

1. A location map.
2. A site map.
3. Additional figures such as groundwater contour or contamination contour maps, if they assist in visualizing the findings.
4. A brief description or reference of the applicable standard test methods run.
5. All semiannual data with relevant comments and conclusions
6. Comments, conclusions and recommendations based on an evaluation of the information included in the report, which must be stamped by a Professional Engineer. Statistics will be used wherever possible to develop an understanding of the effectiveness of the remedy and to begin to identify any trends with regard to the achievement of remedial objectives.

7.1.3 Five Year Reports:

The five-year reports are a compilation of data from yearly reports. Five-year reports are produced with a goal to identify long-term trends. The 5-year report will be similar to the

annual reports but will, in addition, identify long-term trends based on additional statistical analysis of the accumulated data.

8.1 PREFACE

The plan detailed below is designed to provide a comprehensive and practical community relations program geared to the successful completion of the New York City Department of Environmental Protection's (DEP) Operations Maintenance and Monitoring Plan for the Pelham Bay Landfill (Bronx, NY). The Plan is developed in compliance with New York State regulations and guidelines.

8.2 INTRODUCTION

DEP contracted with Woodward-Clyde Consultants Inc., an environmental and engineering consulting firm, to conduct the Pelham Bay Landfill RI/FS, as mandated by the Administrative Consent Order (April 17, 1990) between the City of New York and the New York State Department of Environmental Conservation (NYSDEC). The purpose of the RI/FS was to investigate the nature and extent of contamination at the Pelham Bay Landfill, assess any effects on human health and the environment, and develop and evaluate methods for remediation of the site. All alternatives were designed to protect human health, reduce environmental impacts and mitigate on-site hazards.

The RI phase of the 15-month RI/FS study, which began in April 1992 focused on the conduct of field investigations to determine the presence of contaminants in the water, air, sediment, soil, fish, and shellfish in and around the landfill. These investigations include drilling and ground water sampling to identify components of the leachate (the liquid that percolates down through the landfill); a comprehensive on-site and off-site air monitoring program to identify substances that the landfill may be emitting; and studies of Eastchester Bay and the Hutchinson River to assess the impact of the landfill on water quality in these water bodies. This included analyses of tides, currents, sediments and aquatic life.

The RI/FS also included a baseline risk assessment to identify potential human and ecological risks posed by the landfill and a treatability study to determine the suitability of various alternatives for treating leachate and ground water at the site. During the FS phase of the project, information gathered was then evaluated to assess the appropriateness to effectively mitigate any hazards created by the site.

8.3 SITE INFORMATION

8.3.1 Site Setting

The Pelham Bay Landfill is located in the Bronx, adjacent to Pelham Bay Park. It is bordered on the east by both the Hutchinson River and Eastchester Bay, on the north by Pelham Parkway, and

on the west by Pelham Bay Park. The site encompasses approximately 89.3 acres and 130 feet in height.

8.3.2 History

The Pelham Bay Landfill was operated as a municipal solid waste disposal facility by the New York City, Department of Sanitation (DOS) beginning in 1963. Until it was closed in 1979, the landfill accepted an average of 2,700 tons of household waste and general refuse per day.

Since its closure, numerous studies have been conducted to investigate the possible impact of the landfill on public health and the environment. In 1983, a Phase I preliminary investigation of the landfill was conducted by the New York State Department of Environmental Conservation (DEC). Steep slopes, landfill odors and security were noted as problems during this investigation. In 1985, as a result of the earlier investigation and other sampling activities, DEC classified the site as Class 2A Inactive Hazardous Waste Site (temporary classification for sites known as suspected of containing hazardous waste). Based on the results of further investigations, the site was reclassified as a Class 2 Inactive Hazardous Waste Site in 1987. This classification, which applies to sites that are deemed to pose a significant threat to health or the environment, allowed the landfill to qualify for priority funding under the Environmental Bond Act of 1986.

In October 1988, DOS implemented several temporary actions to improve safety at the site and to minimize impacts on the health and environment of the surrounding area. These included construction of French drains to collect leachate, rehabilitation of parts of the on-site road, installation of additional fencing around the perimeter of the landfill, regrading and seeding of portions of the site, construction of a rip-rap swale on the east edge of the landfill, and construction of a conduit from a leachate seep on the east edge of the landfill into Eastchester Bay.

Responsibility for environmental review of the landfill was transferred from DOS to DEP in the fall of 1990. A Draft Work Plan for the RI/FS was developed by DEP and Woodward Clyde Consultants Inc and presented at a Public Meeting in February 1991. This meeting provided the public with the opportunity to ask questions and comment on the scope of work to be performed as part of the upcoming study.

8.4 COMMUNITY RELATIONS PROGRAM

8.4.1 Objectives/Tasks

The community relations program was designed to fulfill the public information and citizen participation needs of the RI/FS. It supported the technical studies by ensuring that interested and affected publics have ongoing opportunities to remain informed of project progress and involved in the development and evaluation of alternatives for remediating the site. To accomplish this, liaison was provided between the technical project staff, agency representatives, public officials, an independent Science Advisory Committee, and members of the Pelham Bay community. The latter included the Pelham Bay Landfill Task Force; Bronx Community Boards #10 and 11;

environmental, civic and health organizations; and area residents and businesses. In order to encourage the active participation of Hispanic constituencies in the project area, newsletters were prepared in both Spanish and English, Spanish translators were available at public meetings and meeting announcements were published in the Spanish press.

The community relations program that was developed to achieve these objectives incorporated both formal and informal mechanisms for informing and interacting with the public. The program included bi-monthly meetings of the Pelham Bay Landfill Task Force, active guidance by a Science Advisory Committee, widespread distribution of bi-lingual (English/Spanish) project newsletters and other informational materials, maintenance of information repositories, three public meetings, ongoing media contact and informal community liaison. These activities were geared to:

- . Maintaining ongoing dialogue between DEP, its consultants, and the community. In particular, the program encouraged active two-way discussion of project-related issues and findings, including analysis of the effects of all alternatives.

- . Providing the public with up-to-date project information. Although project newsletters served as the principal means of continually updating the public on study progress, Task Force meetings, public meetings, and informal liaison provided additional opportunities for open communications.

- . Addressing critical issues of public concern in the context of study findings. This was especially important in terms of thoroughly evaluating and explaining findings pertinent to the health and safety of communities adjacent to the landfill.

- . Channeling public input and recommendations to the technical project team and providing timely feedback in response to community questions.

The community relations program was conducted by DEP's Office of Community Outreach, with support from the public participation consulting firm of Helen Neuhaus & Associates Inc. and the engineering and environmental consulting firm of Woodward-Clyde Consultants Inc.

8.4.2 Issues and Concerns

The community relations program provided a framework within which to consider all significant project related issues that have been identified as being of particular concern to constituencies in the project area. These included the following:

8.4.3 Public Health – The Pelham Bay Landfill was long considered a possible health hazard for residents of the area, persons using Pelham Bay Park for recreational activities, and individuals fishing and bathing in Eastchester Bay. Public concern has been expressed regarding the possible disposal of leachate entering Eastchester Bay, and gas vapors and odors emanating from the site. A major project goal was to characterize the landfill and the surrounding area in order to identify potential health risks and suitable remediation measures to protect the public.

8.4.4 Environmental Impacts – The Pelham Bay community consistently emphasized the need to assess all possible environmental impacts of the landfill prior to developing a remediation plan. The technical Work Plan reflected the community's concerns and included examination of the impacts of the landfill on air, soil, surface and ground water, leachate, and the ecosystem of the area. Field investigations were conducted to characterize the landfill and the nature and extent of contamination to air, water and soil. Studies involved extensive air monitoring at the landfill, at locations near the landfill and in homes in the Pelham Bay Community; water quality analyses included studies of tides, currents, sediments, and aquatic life; leachate collection and testing; and an Eco-risk analysis to sample soil, sediment, fish, shellfish and plant life.

8.4.5 Credibility/Validity of Testing - The Pelham Bay community was vocal in expressing its concerns about the credibility, comprehensiveness and validity of work previously performed at the landfill. Specifically, area residents indicated frustration with the lack of responsiveness of involved agencies and skepticism over the adequacy of fieldwork related to critical community issues. In response to these concerns, a Science Advisory Committee was formed in 1990 to advise the community and provide an independent scientific perspective to the RI/FS.

8.4.6 Schedule - One of the Pelham Bay community's principal concerns was the lengthy timeframe involved in completing the RI/FS and eventually remediating the landfill site. The public was particularly anxious with regard to seeing progress in identifying and eliminating any potential health and environmental risks posed by the landfill. DEC's 1990 Consent Order recognized and addressed the community's concerns by imposing a compressed project schedule that called for completion of the RI/FS by June 1993.

8.4.7 Community and Agency Coordination – The public is aware that effective implementation of the Pelham Bay Landfill project requires ongoing interagency coordination, as well as liaison with organizations developing other projects in the area. Agencies that became involved in the project included the Agency for Toxic Substances and Disease Registry on the federal level; the Departments of Environmental Conservation, Health, and the Office of Parks, Recreation and Historic Preservation on the State level; and on the city level, the Departments of Environmental Protection, Health, and Parks and Recreation, the Office of the Bronx Borough President, and Bronx Community Boards # 10 and 11. In addition, two independent bodies, the Pelham Bay Landfill Task Force and the Science Advisory Committee, were established to facilitate active, ongoing, and productive interface between the public and the project team.

8.5 PROGRAM ACTIVITIES

Specific elements of the Citizen Participation and Public Outreach Plan are highlighted below:

8.5.1 Advisory Committees – A critical element of the Pelham Bay project was the active participation of two independent review bodies, the Pelham Bay Landfill Task Force and the Science Advisory Committee (SAC).

The Task Force, established by Bronx Borough President Fernando Ferrer in 1989, was an advisory group that included elected officials, civic leaders, representatives of environmental organizations and area residents. The group worked closely with the project team to provide input on health, environmental and other pertinent issues as well as to provide outreach to interested and affected publics. The Task Force, which was chaired by Assemblyman John Dearie, met on a bi-monthly basis throughout the duration of the Project.

The SAC was a 9-member panel that was formed in 1990 to oversee, analyze and guide the work of the project team in order to ensure that all community concerns were thoroughly addressed. Specifically, the Committee's mandate included the following:

- 1) To serve as a feedback mechanism for DEP, the consultant team and the community.
- 2) To ensure the credibility and validity of the work being performed and
- 3) To explain and interpret individual aspects of the project to the community. Committee members, selected by both DEP and the Task Force, included experts in the fields of ecology, toxicology, environmental health and remedial activities. By serving in an independent technical role, the SAC added credibility to the project and provided an important link between the community and DEP.

8.5.2 Public Meetings - The 15-month RI/FS included three formal public meetings to provide information about the project and opportunities for the receipt of public input. These meetings were held at times and places accessible to the community and were publicized in citywide, local and minority newspapers.

The first public meeting was scheduled for summer 1992 and reported on the status of the Intermediate Leachate Collection System; familiarized the community with the background, objectives and timeframes of the RI/FS; and described the ongoing fieldwork and planned activities. The second public meeting was scheduled for December 1992 and presented the findings of the RI, discussed potential alternatives for treating the site and received and responded to the public's questions and comments. The final public meeting held in June 1993 officially presented the Feasibility Study (FS).

Responsiveness summaries documented each meeting by summarizing technical presentations along with public comments and questions. The summaries were distributed to all persons on the project mailing list.

8.5.3 Information Dissemination - The principal objective of the community outreach program was to keep the community informed of progress on the RI/FS. This was primarily accomplished by distribution of project newsletters and conduct of public meetings at project milestones. In addition, display advertisements were used to announce public meetings and information repositories were maintained to ensure public access to project materials. As appropriate, photography and videotaping documented activities at the landfill.

8.5.4 Public Information Materials - Through out the project, written and graphic public information materials were developed to facilitate public understanding of the project, detail the findings of the RI/FS and described the proposed remediation plan. Bi-lingual (English/Spanish) newsletters were distributed to the entire project mailing list on a bi-weekly basis through August 1992 and monthly thereafter. They provided updates on project progress, identified potential community impacts and advised the public of upcoming meetings and other community outreach activities. Audio-visual and graphic aids were also prepared to facilitate understanding of the project. These included videotapes, slide presentations, photography, large-scale meeting displays and accompanying handouts. Appropriate materials were included with meeting notices, distributed as meeting handouts and placed in project repositories.

8.5.5 Public Notifications & Media Relations – Public meeting announcements were designed to reach diverse constituencies throughout the project area. As a supplement to letters of invitation to all persons on the project mailing list, informational advertisements were placed in citywide, local and minority newspapers prior to each of the three formal public meetings. To reach Hispanic constituencies in the Pelham Bay area, announcements were also prepared in Spanish for publication in the Spanish press.

Other media activities were coordinated throughout the RI/FS to ensure that the press was provided with accurate and up-to-date information. Special efforts were made to encourage local weekly papers to provide individualized press coverage of the project. Press packets were distributed to the media, press briefings were scheduled and meetings with editorial boards were held to discuss project goals and objectives and to describe site-specific sampling and monitoring activities.

8.5.6 Project Repositories. – Five information repositories provide the public with opportunities to review written and graphic materials relating to the project. Materials available at the repositories included technical data and reports, narrative summaries of studies, minutes of Task Force and SAC meetings, Responsiveness Summaries, newsletters, and other relevant background materials. The repositories are at the following locations:

Community Board # 10
3165 East Tremont Avenue
Bronx NY
(212) 892-1161

City Island Library
320 City Island Avenue
Bronx, NY
(212) 885-1703

Pelham Bay Branch Library

3060 Middletown Road
Bronx, NY
(718) 792-6744

Office of Community Outreach
New York City, Department of Environmental Protection
59-17 Junction Boulevard
Flushing, NY 11373
(718) 595-3496

8.5.7 Mailing List – A preliminary project mailing list of over 300 organizations and individuals was developed in coordination with DEP, Office of Bronx Borough President Ferrer, and Bronx Community Boards # 10 and 11. The list was supplemented and updated six times during the 15-month project. The mailing list included the following categories:

- . Agencies
- . Community Boards
- . Elected Officials
- . Environmental Organizations
- . Individuals
- . Newspapers
- . Organizations/Institutions
- . Science Advisory Committee
- . Task Force
- . Repositories

8.6 PROGRAM ADMINISTRATION AND DOCUMENTATION

In order to properly coordinate the community outreach program with the technical studies, liaison was maintained with DEP, members of the consultant's team, the Pelham Bay Landfill Task Force and the SAC. This was accomplished through attendance at bi-monthly progress meetings and planning sessions, telephone conversations and informal and review of technical documents as needed. In addition, all community outreach activities were documented by means of meeting minutes, monthly progress reports, Responsiveness Summaries and correspondence and memoranda, as appropriate.

8.7 COMMUNITY PARTICIPATION DURING OPERATION MAINTENANCE AND MONITORING

Remediation of the Pelham Bay Landfill was successfully completed in October 1998. A public meeting was held at the Knights of Columbus Hall. At that time all the remediation efforts and accomplishments were detailed for the public. The landfill was then deemed to have entered the post-closure Operations Maintenance and Monitoring phase. An Operations and Maintenance plan was initiated which insured the continued operation of landfill systems such as leachate

collection, gas flare operations, and cap maintenance along with continued monitoring of environmental contaminants. The Operations and Maintenance phase is projected to last 30 years, unless modified by NYS Department of Environmental Conservation.

During this Operations Maintenance and Monitoring Phase, the Community will continue to be kept informed of all significant activities that affect the landfill and/or the community. There is no set schedule for community interface. The frequency and forum of updates will be coordinated with the community. It is projected that initial contacts with the community will be made through local Community Boards.

8.8 CURRENT PROJECT CONTACTS:

The following agency, consultant, and community contacts are established for the Pelham Bay Landfill Project:

8.8.1 New York City Department of Environmental Protection

Rupak Raha, Project Manager
Bureau of Wastewater Treatment
New York City, Department of Environmental Protection
96-05 Horace Harding Expressway
Corona, NY 11368
(718) 595-6021

Michael Quinn
Director
Bureau of Wastewater Treatment
New York City, Department of Environmental Protection
96-05 Horace Harding Expressway
Corona, NY 11368
718-595-5043

Mark Lanaghan, Director
Office of Community Outreach
New York City, Department of Environmental Protection
59-17 Junction Boulevard – 19th Floor
Flushing, NY 11373
(718) 595-3519

8.8.2 New York City Law Department

Susan Kath
Environmental Director
100 Church Street

NYC, NY 10007
(212) 788-1587

8.8.3 New York City Department of Parks and Recreation

Eileen Boyle
Pelham Bay Park & Van Courtland Park Administrator
New York City Department of Parks and Recreation
1 Bronx River Parkway
Bronx, NY 10462
(718) 430-1890

Adrian Benepe
Commissioner
New York City Department of Parks and Recreation
The Arsenal
New York, NY 10021
(212) 360-1345

8.8.4 New York State Department of Environmental Conservation

Nigel Crawford
New York State Department of Environmental Conservation
Hazardous Waste Remediation Unit - Region 2
47-40 21st Street
Long Island City, NY 11101
(718) 277-4600 ext16

8.8.5 Community Contacts

Adolfo Carrion, Jr.
Bronx Borough President
Executive Division
851 Grand Concourse
Bronx, NY 10451
(718) 590-3537

Community Board # 10
3165 East Tremont Avenue
Bronx NY 10461
(718) 892-1161

Community Board # 11
1741 Colden Avenue
Bronx NY 10462

(718) 892-6262

City Island Library
320 City Island Avenue
Bronx, NY (718) 885-1703

8.8.6 Contractor

Severn Trent, Inc.
Regional Director
Mr. Tom Varley
100 Morris Avenue
Glen Cove, New York 11542
(516) 674-6032

8.9 FREEDOM OF INFORMATION LAW (FOIL) PACKET

8.9.1 Freedom of Information Law “FOIL” Requests

All Freedom of Information Law (FOIL) requests can be sent to:

Marie Dooley Assistant Counsel
Freedom of Information Officer
Records Access Office
New York City Department of Environmental Protection
59-17 Junction Blvd Lefrak City - 19th Floor High-Rise
Flushing, NY. 11373-5108

8.9.2 Freedom of Information Law “FOIL” Procedures

In the processing of “FOIL” requests, there are several general guidelines to use. In the first instance, The NYC Department of Environmental Protection (DEP) screens the records or portions thereof, to determine if the records may be released.. DEP would deny access to the records or portions thereof if they fall within one of the following “FOIL” exemptions:

- a) They are specifically exempted from disclosure by state or federal statute;
- b) If disclosed they would constitute an unwarranted invasion of personal privacy;
- c) If disclosed they would impair present or imminent contract awards or collective bargaining negotiations;

- d) They are trade secrets or are submitted to DEP by a commercial enterprise or derived from information obtained from a commercial enterprise which, if disclosed, would cause substantial injury to the competitive position of the subject enterprise;
- e) They are compiled for law enforcement purposes and which, if disclosed would cause results specifically set out in the law;
- f) If disclosed they would endanger the life or safety of any person;
- g) They are inter-agency or intra-agency materials which are not:
 - 1) statistical or factual data;
 - 2) instructions to staff that affect the public
 - 3) final agency policy or determinations, or
 - 4) external audits;

In this regard, pertaining to No.1, opinions, recommendations and conclusions do not have to be released, and pertaining to No.3, non-final material and/or drafts do not have to be released.

- a) They are examination questions or answers which are requested prior to the final administration of such questions;
- b) They are computer access codes.

Note that DEP does not release names, addresses, phone numbers or any other identifying details pertaining to complainants. In addition, regarding Department of Environmental Protection Agency officers or employees, the only material releasable is a record setting forth the name, public office address, title, and salary of such employee. The fee charged for release of documents pursuant to "FOIL" is generally 25 cents per page, made payable by check or money

order to the "City of New York" and, after the check is received from the public citizen, it is forwarded to (at present) Joseph Terracciano, Director of Revenue and Claims.

Department of Environmental Protection reads all documents before being made available for public inspection and copying. Should any of the above exemptions be invoked in order to exclude any or part of a given document by the DEP, then only the exempt material will be deleted.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

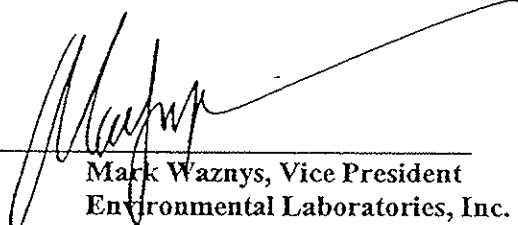
9.1 Plan Attached

**SITE-SPECIFIC
HEALTH AND SAFETY PLAN (HASP)**

**NYCDEP CONTRACT PELHM-01
PELHAM BAY LANDFILL
BRONX, NEW YORK**

**SEVERN TRENT SERVICES, INC.
GLEN COVE, NEW YORK**

Prepared By:



Mark Waznys, Vice President
Environmental Laboratories, Inc.
57 Verdi Street
Farmingdale, NY 11735
Phone: (631) 420-1866

Reviewed By:



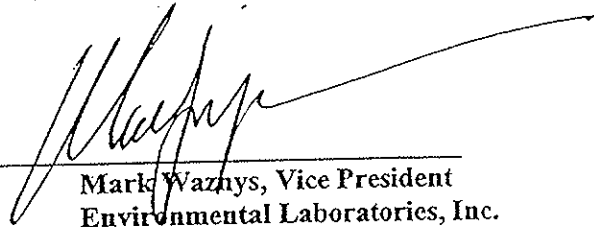
Sheila Bubka, C.E.H.

**SITE-SPECIFIC
HEALTH AND SAFETY PLAN (HASP)**

**NYCDEP CONTRACT PELHM-01
PELHAM BAY LANDFILL
BRONX, NEW YORK**

**SEVERN TRENT SERVICES, INC.
GLEN COVE, NEW YORK**

Prepared By:



**Mark Waznys, Vice President
Environmental Laboratories, Inc.
57 Verdi Street
Farmingdale, NY 11735
Phone: (631) 420-1866**

Reviewed By:



Sheila Bubka, C.I.H.

TABLE OF CONTENTS

Cover Letter	Page #
1.0 INTRODUCTION	1
1.1 Work Scope	1
1.2 Omissions	1
1.3 Expected Contaminants	1
2.0 PROJECT PERSONNEL AND TASK RESPONSIBILITY	2
3.0 HAZARD ANALYSIS CONTROL	4
3.1 Anticipated Hazards	4
4.0 PERSONAL PROTECTIVE EQUIPMENT PROGRAM (PPE)	7
4.1 PPE Selection and Training	7
4.2 Levels of Protection	7
4.2.1 Level A PPE	8
4.2.2 Level B PPE	8
4.2.3 Level C PPE	9
4.2.4 Level D PPE	9
4.3 PPE Reassessment Program.....	9
5.0 RESPIRATORY PROGRAM	10
5.1 Employee Fit Testing, If Required	10
5.2 Medical Certification	10
5.3 Training	10
5.4 Decontamination	10
5.5 Respiratory Protection Inspection	11
6.0 HEAT STRESS AND COLD STRESS MONITORING	12
6.1 Heat Stress	12
6.2 Cold Stress Monitoring	13
7.0 EMERGENCY RESPONSE	15
7.1 Emergency Contacts	15
7.2 Emergency Planning and Emergency Responsibility	16
7.3 Types of Emergencies	16
7.3.1 Emergency First Aid/Medical Treatment	16
7.3.2 Personnel Injury	16
7.3.3 Personnel Exposure	17

TABLE OF CONTENTS (continued)

	Page #
7.3.4 Decontamination for Medical Emergencies	17
7.3.5 Transportation to Emergency Facilities/Hospital	17
7.3.6 Environmental Accident (Spread/Release of Contamination)	18
7.3.7 Spill Containment Program	18
7.3.8 Fire Extinguishers	19
7.4 Severn Treat Trailer	19
7.5 Emergency Communications	19
7.5.1 Telephones	19
7.5.2 Air Horns	19
7.4.3 Hand Signals	19
8.0 MEDICAL SURVEILLANCE PROGRAM	20
8.1 General	20

APPENDIX

- A NEAREST HOSPITAL, ROUTE AND PHONE NUMBER
- B HAZARD COMMUNICATION AND MSDS SHEETS
- C NYCDEP SAFETY POLICIES
- D SITE EMERGENCIES AND CONTINGENCY PLAN
- E INSPECTION LOG/SAFETY CHECKLIST
- F HASP ACKNOWLEDGEMENT FORM AND LIABILITY RELEASE FORM

1.0 INTRODUCTION

1.1 Work Scope

This site specific Health and Safety Plan (HASP) addresses both safety and environmental concerns with regard to work performed by Severn Trent Services, Inc. of Glen Cove, New York for NYCDEP project PELHAM-01. The work shall be performed within the confines of the Pelham Bay Landfill, Bronx, New York.

The Pelham Bay Landfill is located on Pelham Parkway and East Chester Bay, Bronx, New York. The landfill work under this contract is considered post closure. No work shall be performed below the geomembrane, therefore, there will be no exposure to contaminated soils.

In general, work includes the following subtasks:

- Inspection Services;
- Maintenance Services; and,
- Repair Services.

The above services shall be directed towards the following systems:

- Landfill cover system;
- Storm Water Management System;
- Ground Water/Leachate Management System;
- Landfill Gas Management System; and
- Ancillary Systems.

1.2 Omissions

The following items are omitted from this HASP:

- Working with contaminated soils (work will be performed within the top 12" of cover soil and above the geomembrane; and,
- Lead and asbestos work.

1.3 Expected Contaminates

Expected contaminants:

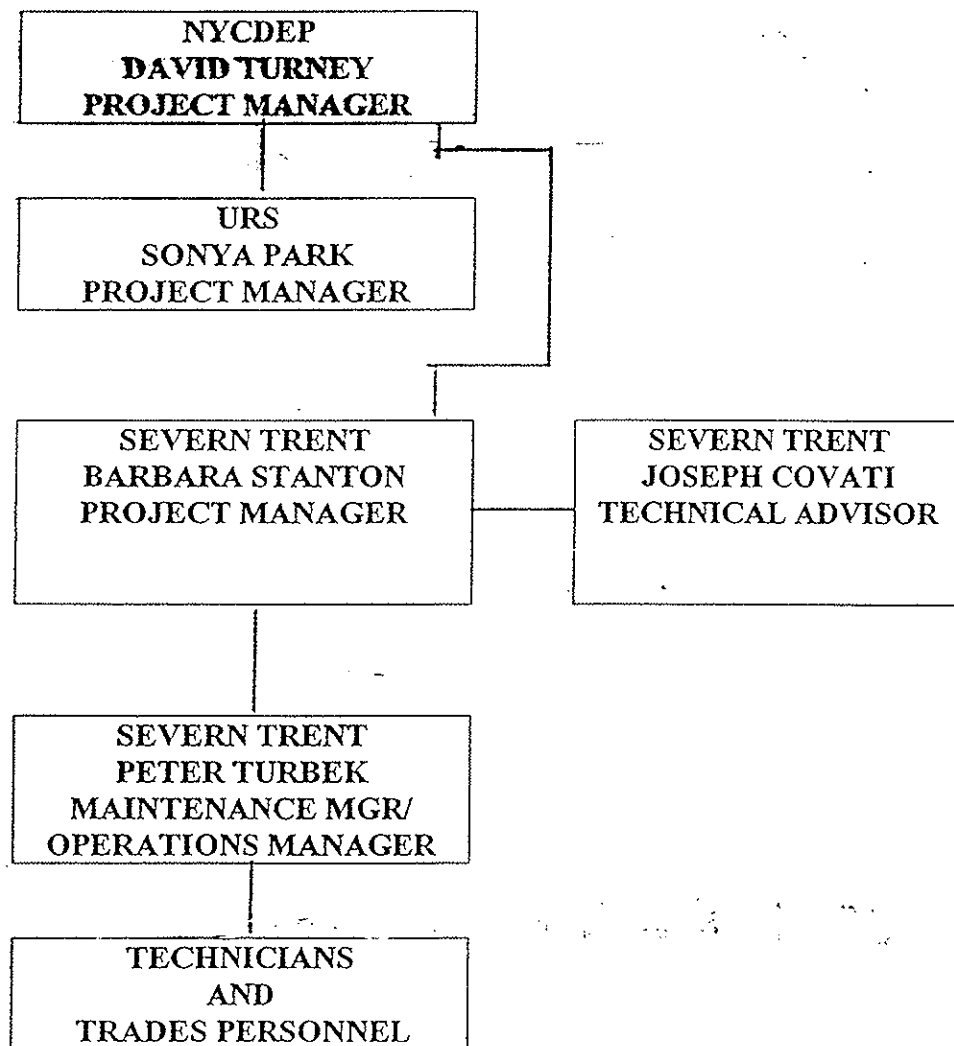
- Methane, H₂S;
- Leachate exposure, possible heavy metals, PCBS, etc. ; and,
- Chemical exposure, pesticide application.

2.0 PROJECT PERSONNEL AND TASK RESPONSIBILITY

The following tables summarizes Severn Trent's (ST) project team, contact numbers and task responsibility for each member.

SEVERN TRENT SERVICES, INC. NYCDEP CONTRACT PELHM-01

PROJECT TEAM ORGANIZATION



PROJECT PERSONNEL
CONTACT AND TASK RESPONSIBILITY

<u>CONTACT</u>	<u>TASK</u>
<p style="text-align: center;"><u>NYCDEP</u> David Turney, Project Manager Office: (718) 595-7706 Cell: (917) 769-1279 Fax: (718) 595-4422</p>	<p style="text-align: center;">Project Manager for NYCDEP on this project.</p>
<p style="text-align: center;"><u>URS</u> Sonya Park Project Manager Office: (212) 594-2118 Fax: (212) 629-3298</p>	<p style="text-align: center;">Project Manager for URS Engineering Design Oversight Services</p>
<p style="text-align: center;"><u>Severn Trent</u> Barbara Stanton Project Manager Office: (516) 674-6032 Fax: (516) 674-0151</p> <p style="text-align: center;">Peter Turbek Maintenance Manager/ Operations Manager Office: (516) 674-6032 Fax: (516) 674-0151 Cell: (631) 445-9775</p>	<p style="text-align: center;">Severn Trent Project Manager Field management of personnel, safety representatives, compliance to contract specs, including all safety and environmental issues.</p> <p style="text-align: center;">Maintenance and Operations Manager Supervises field staff, including technicians, plumbers, electricians and inspectors.</p>

3.0 HAZARD ANALYSIS CONTROL




3.1 Anticipated Hazards

The following table illustrates potential hazards that may be encountered during performance of the contract.

Hazard	Control
Tripping Hazards	Follow general safe work practices, keep work areas clear of debris and remove waste from work areas.
Hotwork, Fire Explosions, Welding Furnace, Exposure	<p>Hotwork is considered to be welding, cutting with torches or brazing. Applicable CFR: 29 CFR 1926.35 and 1910.252.</p> <p><u>Cylinders and Manifolds:</u> All cylinders shall be transported in an upright position with valve protection caps. Transport will be performed by hand-truck with cylinders secured. Gas cylinders shall be secured in an upright position at all times, except while being hoisted or carried. Storage shall be in well ventilated areas, at least 20 feet away from combustible material and not stored in hallways, etc. where worker passage is facilitated, O₂ cylinders will be placed 20 feet away from fuel cylinders or 5 feet away from fuel cylinders. When using a non-combustible barrier, all valves and manifolds shall be checked previously (weekly) to be free from leaks and dirt/oil. At the end of each work day, all cylinders shall be secured with valves closed valve protection caps secured. Tags will be tied to the cylinders indicating contractor name and contact phone number. All cylinders shall be labeled as to their contents, i.e. acetylene or O₂.</p> <p>Empty cylinders shall be stored separately and labeled. All hoses shall be inspected weekly for damage and prior to work. Fuel and O₂ hoses shall not be interchanged.</p> <p><u>Arc Welding or Cutting:</u> All welding and cutting cables shall be flexible type and insulated. All welding shall be properly grounded during cutting/welding. Flameproof shields or screens shall be employed to prevent arc light exposure. During all welding or cutting operations, work shall be performed in well-ventilated areas or with mechanical ventilation.</p> <p><u>Fire Protection:</u> No welding or cutting shall be performed in areas of combustible material concentration causing a hazard. ELI shall monitor these areas for LEL, O₂ and H₂S.</p> <p>Suitable Class ABC fire extinguishers shall be at all hotwork locations. The Severn Trent Project Manager will determine if a fire watch is needed in accordance with 1910.252iii.</p>

Hazards (continued)	Control
Hotwork, Fire Explosions, Welding Fume, Exposure (continued)	<u>Personal Protective Equipment:</u> While welding and cutting, the minimum PPE shall be Level D protection with welder's helmet/goggles, welding gloves and protective outer clothing. Severn Trent's Project Manager shall upgrade PPE usage, as required.
Pesticide Application	Workers to wear Level C PPE, including full-face respirators. Limit over spraying by observing wind direction; follow MSDS sheets for pesticides used. MSDS sheets are to be added to this HASP.
Insect Exposure	Workers to wear long pants, work boots, socks and long sleeve shirts. Inspect body for insect bites and dislodge attached insects from clothing.
Electrical (General)	All extension cords shall be free of excessive wear and must have a grounding plug. Any cords found to be damaged shall be discarded and replaced. GFIs shall be utilized. While working in potentially hazardous areas, explosion-proof lighting and equipment shall be used. Proper grounding must be used.
Confined Spaces: Hazardous Atmospheres (CH ₄ , H ₂ S, O ₂ Def.)	ST to provide Confined Space (CS) procedures; all persons working in CS have Confined Space Awareness Course; provide Confined Space Supervisor; provide continuous air monitoring. Follow 20 CFR 1910.146 criteria and O&M Manual (Appendix).
Pipe Dope and PVC Cement, Cutting Oil and Solder Acetylene Gas	Follow MSDS sheets and manufacturer's recommendation on limiting exposure. Work in well-ventilated or open areas.
Leachate Transport and Heavy Vehicle Traffic	Utilize existing gravel Leachate transfer area. Decon trucks and personnel. Use chemical resistant outerwear, workers to wear reflective vests, use hand signals for directing trucks.
Noise	For work areas having a noise level of 85dB or above for longer than 15 minutes, workers will wear hearing protection, muffs or ear plugs.
Power Tools (hand power tools)	Safe work practices; use grounded electrical supply; use tool guards supplied; if battery operated, do not drop battery.
Shoreline (with work performed at the Landfill shore line)	Drowning hazard - If workers are working in or adjacent to water, each worker, in addition to Type D PPE, shall be equipped with a USCG-approved buoyant work vest, a ring buoy with 100 feet of line for rescue purposes, shall also be at the site. Ring buoys will be positioned every 200 feet at the shoreline. All activities on the shoreline will use the buddy system; communication with Severn Trent job trailer will be kept at all times.

OTHER PROTECTIVE EQUIPMENT AND HYGIENIC PRACTICES
NONE
SECTION IX - SPECIAL PRECAUTIONS
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
NONE
OTHER PRECAUTIONS
NONE
<small>This information contained here... is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof.</small>

-  **Back to Home**
-  **Back to List Price Sheet Index Page**
-  **Back to MSDS Index Page**

Hazards (continued)	Control
Severe Weather Rainstorms and Lightning (working in the field)	Due to the open area where work is performed, a possibility for lightning strikes is present. Weather station data will give advanced notice of weather front movements. Notice to on-site workers shall be given by Severn Trent Project Manager to seek shelter. If caught in a lightning storm, workers should not stand near or touch metal objects or stand under trees. Workers should keep low as possible.
Biological	Working in vegetation areas may cause exposure to insects and toxic plants. Workers should be aware of these hazards and should wear long pants, long sleeved shirts and work boots. First Aid Kits will be available at Severn Trent's trailer. Potential for encountering biological contaminated items and rodents. Avoid contact with accumulations of bird and rodent droppings.

4.0 PERSONAL PROTECTIVE EQUIPMENT PROGRAM (PPE)

4.1 PPE Selection and Training

Severn Trent personnel will be equipped, at minimum, with Level D PPE.

Personal protective program equipment shall be selected and used to meet the requirements of 29 CFR 1910. Subpart I and 29 CFR 1910.132 taking the following into considerations:

- PPE selection based upon site hazard;
- PPE use and limitations of the equipment;
- Work mission duration;
- PPE maintenance and storage;
- ~~PPE decontamination and disposal;~~
- ~~PPE training and proper fitting;~~
- ~~PPE donning and doffing procedures;~~
- ~~PPE program evaluation;~~
- PPE inspection procedures prior to during and after use;
- Limitation during temperature extremes, heat stress, and other medical consideration.

4.2 Levels of Protection

4.2.1 Level A PPE

Level A PPE ensemble includes:

Required

- Pressure-demand, full-face piece SCBA or pressure-demand supplied-air respirator with escape SCBA;
- Fully-encapsulating, chemical-resistant suit;
- Inner chemical-resistant gloves;
- Chemical-resistant safety boots/shoes, and;
- Two-way radio communications;
- Outer Laminated Gloves

Optional

- Cooling unit;
- Coveralls;
- Long cotton underwear;
- Hard hat, and
- Disposable gloves and boot covers.

4.2.2 Level B PPE

Level B PPE ensemble includes:

Required

- Pressure-demand, full-face piece SCBA or pressure-demand supplied-air respirator with escape SCBA;
- Chemical-resistant clothing (overalls and long-sleeved jacket; hooded, one or two piece chemical splash suit; disposable chemical-resistant one-piece suit);
- Inner and outer chemical resistant gloves;
- Hard hat, and;
- Two-way radio communications.

Optional

- Coveralls;
- Disposable boot covers;
- Faceshield, and;
- Long cotton underwear.

4.2.3 Level C PPE

Level C PPE ensemble includes;

Required

- Full-face piece, air purifying, cartridge-equipped respirator (organic vapor/acid gas/P100 type);
- Chemical-resistant clothing (overalls and long-sleeved jacket; hooded, one or two piece chemical splash suit; disposable chemical-resistant one-piece suit);
- Inner and outer chemical resistant gloves;
- Hard hat, and;
- Two-way radio communications;
- Chemical-resistant boots and reflective vests for those workers working near heavy traffic.

Optional

- Coveralls;
- Escape mask;
- Faceshield, and;
- Long cotton underwear.

4.2.4 Level D PPE

All employees working at this site must use a minimum of Level D PPE.

Level D PPE ensemble includes:

- Coveralls or appropriate work clothes;
- Hard hat;
- Safety glasses (or goggles as necessary), and;
- Safety boots/shoes;
- Reflective vest near traffic.

At minimum Level D, PPE may be employed by all site workers. The Site Safety Rep shall be responsible for worker PPE, upgrades, and downgrades, dependent upon site conditions and levels of contamination.

Increases in PPE to Level C shall be performed upon working near pesticide application activities.

4.3 PPE Reassessment Program

Severn Trent's safety representative shall be in responsible charge for assessing on-site hazards and level of PPE required. Continuous air monitoring by Severn Trent personnel will provide information to the safety representative for PPE upgrades or down grades.

The safety representative shall also weekly inspect all PPE used by site workers. Inspections shall be made on all components to verify they are in proper working order. All damaged equipment shall be discarded and replaced with new equipment.

5.0 RESPIRATORY PROGRAM

5.1 Employee Fit Testing, If Required

Qualitative fit testing of Severn Trent employees will be done in-house with approved test kits. Initial fit testing will be conducted prior to an employee's assignment to a job site where the use of respiratory protection is required. Annual re-testing will be provided. Employees may request a respirator fit test at any time and are encouraged to have a fit test if any of the following conditions occur:

- The employee will be wearing a respirator type or size for which they have been previously fit tested;
- The employee has experienced significant weight loss or gain since their last fit test;
- The employee has experience changes in facial structure since their last fit test (i.e., surgery, cuts or scars, broken jaw).

~~Beards, long sideburns or other facial hair, which may potentially interfere with the proper fit of a~~ respirator, must be removed before an employee may wear respiratory protection on a job site. Prescription eyeglasses, which interfere with the proper fit of full-face respirators, may not be worn. Spectacle kits, specifically designed to fit inside a respirator face piece are available from most respirator manufacturers. An employee who must wear prescription eyeglasses to perform assigned work which also requires the use of respiratory protection, should contact Severn Trent Safety Rep. Each worker will be assigned an air-purifying respirator. They will be in responsible charge for their own maintenance.

5.2 Medical Certification

Only employees who have been medically certified during an industrial physical as capable to ~~safely wear a respirator~~ will be allowed to participate in on-site activities where respirators are required.

5.3 Training

Employees will be trained in the proper selection, use, donning and maintenance of respiratory protection prior to participating in on-site activities where the use of respiratory protection is required.

5.4 Decontamination

SCBA's, supplied-air respirators and air purifying respirators should be dismantled, washed and disinfected after each use, if used.

5.5 Respiratory Protection Inspection

Air-Purifying Respirators

- Inspect air-purifying respirators:
 - Before each use to be sure they have been adequately cleaned;
 - After each use;
 - During cleaning;
 - Monthly if in storage for emergency use.
- Check material conditions for:
 - Signs of pliability;
 - Signs of deterioration;
 - Signs of distortion.
- Examine cartridges or canisters to ensure that:
 - They are proper type for the intended use;
 - The expiration date has not passed;
 - They have not been opened or used previously.
- Check face shields and lenses for:
 - Cracks;
 - Fogginess.

6.0 HEAT STRESS AND COLD STRESS MONITORING

6.1 Heat Stress

The use of certain types of personal protective equipment (PPE) may place an employee at risk of developing heat stress, probably one of the most common (and potentially serious) illnesses encountered at construction sites. The potential for heat stress is dependent on a number of factors, including environmental conditions, clothing, workload, physical conditioning and age. Person protective equipment may severely reduce the body's normal ability to maintain equilibrium (via evaporation, convection and radiation), and by its bulk and weight increases energy expenditure.

Symptoms of heat-related illness are as follows:

- **Heat rash** – a redness or irritation of the skin, may result from continuous exposure to heat or humid air;
- **Heat cramps** – are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:
 - muscle spasms;
 - pain in the hands, feet and abdomen.
- **Heat exhaustion** – occurs from increased stress on various body organs, including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:
 - pale, cool, moist skin;
 - heavy sweating;
 - dizziness;
 - nausea;
 - fainting.
- **Heat stroke** – is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. If symptoms of heat stroke are observed, Severn Trent staff must **ACTIVATE THE EMERGENCY RESPONSE PLAN AND COMPETENT MEDICAL HELP MUST BE OBTAINED.**

Signs and symptoms are:

 - red, hot, unusually dry skin;
 - lack of or reduced perspiration;
 - nausea;
 - dizziness and confusion;
 - strong, rapid pulse;
 - coma.

Safety Rep will begin visually monitoring personnel wearing protective clothing when the ambient temperature is 70 degrees Fahrenheit or above. For individuals complaining of the heat or showing any of the symptoms detailed above, one or more of the following techniques will be used as a screening mechanism:

- Heart rate may be measured by the radial pulse for 30 seconds as early as possible in the resting period. The rate at the beginning of the rest period should not exceed 100 beats per minute. If the rate is higher, the next work period will be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle will be further shortened by 33%.

Body temperature may be measured in the ear with a clinical thermometer as early as possible in the resting period. Temperature at the beginning of the rest period should not exceed 99.6 degrees Fahrenheit. If it does, 10 minutes (or 33%) will shorten the next work period, while the length of the rest period stays the same. However, if the temperature exceeds 99.6 degrees Fahrenheit at the beginning of the next period, the following work cycle may be further shortened by 33%. Temperature will be measured again at the end of the rest period to make sure that it has dropped below 99.6 degrees Fahrenheit. Severn Trent staff members will not be permitted to continue wearing semi-permeable or impermeable garments when his/her temperature exceeds 100.6 degrees Fahrenheit.

6.2 Cold Stress Monitoring

Exposure to cold conditions may result in frostbite or hypothermia, each of which progresses in stages. Severn Trent employees will be trained to recognize symptoms of cold-related illness. These are as follows:

- Frostbite – occurs when body tissue (usually on the extremities) begins to freeze. The three states of frostbite are:
 - Frostnip: This is the first stage of the freezing process. A whitened area of skin, along with a slight burning or painful sensation characterizes it;
 - Superficial Frostbite: This is the second stage of the freezing process. It is characterized by a whitish-gray area of tissue which will be firm to the touch but will yield little pain.
 - Deep Frostbite: In this final stage of the freezing process the affected tissue will be cold, numb and hard, and will yield little to no pain.

If symptoms are observed, the person is removed to a warm area, flush with warm, not hot water; seek medical attention if blisters occur, cover blisters with sterile gauze, do not open blisters.

- Hypothermia occurs when the body loses heat faster than it can produce it. The stages of hypothermia (which may not be clearly defined or visible at first) are the following:

- Shivering;
- Apathy (a change to a disagreeable mood);
- Unconsciousness;
- Bodily freezing;
- Death (if untreated).

The safety rep will begin visually monitoring of personnel when the wind chill factor falls below 20 degrees Fahrenheit or win-chill less than 30 degrees Fahrenheit with precipitation. For individuals complaining of the cold or showing any of the symptoms detailed above, the following technique will be used as a screening mechanism:

- For monitoring the body's recuperation from excess cold, temperature measurements should occur when there are changes in an employee's performance or mental status, an employee's request, as a screening measure, two times per shift, under unusually hazardous conditions, and as a screening measure whenever any one worker on site develops hypothermia.

Any person developing moderate hypothermia (a core body temperature of 92 degrees Fahrenheit) will be sent home and cannot return to work for 40 hours.

7.0 EMERGENCY RESPONSE

7.1 Emergency Contacts

Emergency Information			
Contact		Phone Number	Hospital Directions
			Hospital Name: Jacobi Medical Center
			Directions from Site:
Local Hospital	Jacobi Medical Center	718-918-5000	See Appendix A
Fire Department		911 or 718-430-0266	
NYC Police		911 or 718-822-5411	
NYC Poison Control Center		1-800-962-1253	
NYS DEC (Spill Hotline)		1-800-457-7362	
USEPA National Response Center		1-800-438-2427	
U.S. Coast Guard		1-800-424-8802	
NYS Spill Hotline		1-800-457-7362	
NYCDEP, Div. of HAZMAT Mgmt.	John Wuthenow, Director	718-595-4426	
NYCDEP, Div. of HAZMAT Mgmt.		718-595-3767	
HAZMAT Emergency Response		411	
David Turney, Project Manager		718-595-7706	
NYCDEP Communications Ctr.		411	
URS		212-594-2118	
Severn Trent (prime contractor)		516-674-6032	
Teachate Hauser (RGM)		631-586-0092	

7.2 Emergency Planning and Emergency Responsibility

The SEVERN TRENT Safety Rep has the primary authority for directing response actions at the site area under emergency conditions. Responsibilities under emergency conditions are:

- Implementing this emergency response plan whenever conditions at the site warrant such action;
- Being responsible for assuring the evacuation, emergency treatment and emergency transport of site personnel as necessary;
- Notifying the URS and NYCDEP and the appropriate staff;
- Completing incident reports; and,
- ~~Checking that emergency equipment is available and located in the correct area of the site.~~

7.3 Types of Emergencies

7.3.1 Emergency First Aid/Medical Treatment

During all on-site field activities, at least two (2) persons on-site will be certified in First Aid/CPR. The following sections provide details regarding actions to be taken during emergency First Aid and in contact with blood-borne pathogens.

7.3.2 Personnel Injury

In the event of an injury, the following actions will be taken in their listed order:

- First Aid/CPR-trained field personnel will advise the Severn Trent Safety Rep whether additional assistance by paramedics or transportation to the hospital is immediately required;
- In the event of a serious medical emergency, the Severn Trent Safety Rep shall notify URS/NYCDEP who will contact "911". Whenever possible, personnel should be decontaminated before transporting them to a medical facility. If decontamination is not possible, the transporter and medical facility must be advised that the person may be contaminated;
- If injury is minor, emergency First Aid will be applied on-site as deemed necessary;
- After the emergency has been addressed, an Accident Investigation Report shall be completed and submitted to URS/NYCDEP.

7.3.3 Personnel Exposure

The following emergency procedures are to be followed in the case of unprotected exposure to any known contaminants:

- **Skin Contact:** Use large amounts of soap and water to wash and rinse the affected area for at least 15 minutes. If necessary, transport to the hospital as described above. Personnel wearing chemical resistant protective equipment that are splashed by contaminated liquids will decontaminate and replace PPE;
- **Eye Contact:** If the eye is not cut, copiously flush the affected area, lifting the upper and lower lids, for at least 15 minutes. If eye is cut or a protruding object is visible, stabilize object and wrap bandage around both eyes. Decontaminate and provide medical attention. If necessary, **transport to the hospital as described above.**
- **Inhalation:** ~~Move the affected person to fresh air.~~ Decontaminate and provide medical attention. **If necessary, transport to the hospital as described above**
- **Ingestion:** Decontaminate and transport to the hospital as described above. If necessary, call "Poison Control Center".

7.3.4 Decontamination for Medical Emergencies

Prior to removing an injured person from the work area for First Aid and transportation to emergency facilities, decontamination shall be conducted to the extent possible without harming the injured person or delaying care in a life-threatening situation.

- For a minor, non-life threatening injury, personnel should follow the decontamination procedures, then administer First Aid or transport the injured person to emergency facilities;
- For a major injury or other serious medical concern, immediate on-site First Aid is to be administered or the injured party will immediately be transported to emergency facilities without prior decontamination efforts;
- Outdoor clothing may be removed if it does not delay treatment or aggravate the injury.

7.3.5 Transportation to Emergency Facilities/Hospital

In the event of a serious medical emergency, victims shall be treated at the Jacobi Medical Center. The following actions are to be taken in the order listed. The Severn Trent Safety Rep is in responsible charge.

- Radio or call the URS/NYCDEP Project Manager and request ambulance and brief him/her on the situation, the potential hazards, and the substances involved;
- Determine whether decontamination may be conducted;

- If the injured individual is to be transported by regular vehicle, the Severn Trent Safety Rep or a designated party will drive the injured individual to the hospital, using the route map written directions provided;
- The Severn Trent Safety Rep will provide appropriate medical data sheets to the emergency medical facility/hospital.

Written directions and a map of the route to the hospital (Appendix A) and emergency numbers shall be posted at the site and kept in each Severn Trent vehicle on-site during all activities.

In the event of death of one worker or hospitalization of three or more workers from a single accident, OSHA will be notified within eight (8) hours of becoming aware of the incident.

7.3.6 Environmental Accident (Spread/Release of Contamination)

The following notifications and actions will be conducted in their listed order in the event of an environmental accident:

- Immediately notify the Severn Trent Safety Rep of any environmental accidents;
- Conduct air monitoring for the presence of airborne contaminants;
- If airborne contaminant concentrations are below evacuation action levels as defined by the engineer, and adequate personal protective equipment is being used and spill/release materials are available, secure the spread of contamination immediately as described below; and,
- **Notify the URS Project Manager/NYCDEP.**

7.3.7 Spill Containment Program

Minor spills, such as decontamination solvents (if used), fuel, lubricant oils or other like substances, shall be contained using granular absorbent materials stored at Severn Trent job trailer. The absorbent material shall be collected with a shovel after being applied and temporarily stored in 55-gallon drums with covers to await appropriate disposal at the site.

Should a more serious spill or release occur, the Severn Trent Safety Rep will contact URS/NYCDEP Project Manager who will contact the appropriate emergency response groups for assistance.

7.3.8 Fire Extinguishers

- Two (2) Class ABC dry chemical fire extinguishers will be maintained at each site at an accessible location within the work area;
- Fire extinguishers will be inspected, serviced, and maintained in accordance with the manufacturer's instructions. At a minimum, all extinguishers shall be checked monthly, weighed semi-annually, and recharged when necessary;
- Immediately after each use, fire extinguishers will be either recharged or replaced;

7.4 Severn Trent Trailer

First Aid Kits

- Two (2) First Aid Kits will be maintained in the Severn Trent Trailer and will conform to Red Cross and other applicable good health standards, and shall consist of a weatherproof container with individually sealed packages for each type of item;
- First Aid Kit will be fully equipped before being sent out on-site and will be checked weekly by the Severn Trent Safety Rep to ensure that the expended items are replaced

7.5 Emergency Communication

7.5.1 Telephones

Access to a telephone will be provided at the Severn Trent site office trailer for immediate contact with response personnel in the event of an emergency. In addition, a mobile phone will be kept on-site.

7.5.2 Air Horns

Air horns will be used by personnel to signal emergency conditions.

7.5.3 Hand Signals

Hand signals are to be used by field personnel along with using buddy system. These signals are also very important when working around heavy equipment. They shall be agreed upon by all parties, covered during site-specific training and known by all on-site personnel before operations commence. The following hand signals may be used:

Hand gripping throat	=	can't breathe
Grip wrist or both hands around waist	=	leave area immediately
Hands on top of head	=	need assistance
Thumbs up	=	OK, I am alright, I understand
Thumbs down	=	no, negative

8.0 MEDICAL SURVEILLANCE PROGRAM

8.1 General

There is no requirement for extensive medical surveillance programs as seen in Hazardous Waste Sites.

APPENDIX A

NEAREST HOSPITAL, ROUTE AND PHONE NUMBER

EMERGENCY ADDRESS AND PHONE NUMBERS

JACOBI MEDICAL CENTER
1400 PELHAM PARKWAY
BRONX, NEW YORK

Phone: (718) 918-5000

EMERGENCY: DIAL "911"



Welcome, Guest User

JACOBI MEDICAL CENTER
(718) 918-5000

[Create My Locations - Sign In](#)

Yahoo! Maps

[Maps Home](#)

[Maps](#) | [Driving Directions](#)

Starting from: Pelham parkway & bruckner blvd, Bronx, NY 10469 [Save Address](#)

Arriving at: 1400 Pelham Pkwy S Bronx, NY 10461-1138

[Get Reverse Directions](#)

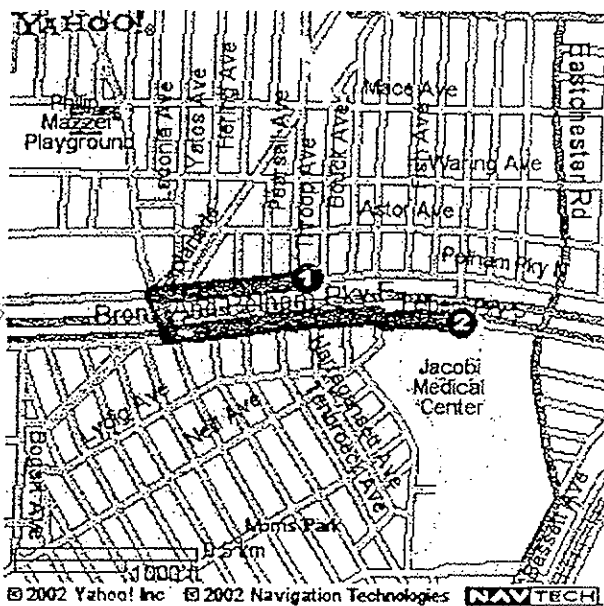
Distance: 0.8 miles Approximate Travel Time: 2 mins

[Email Directions](#)

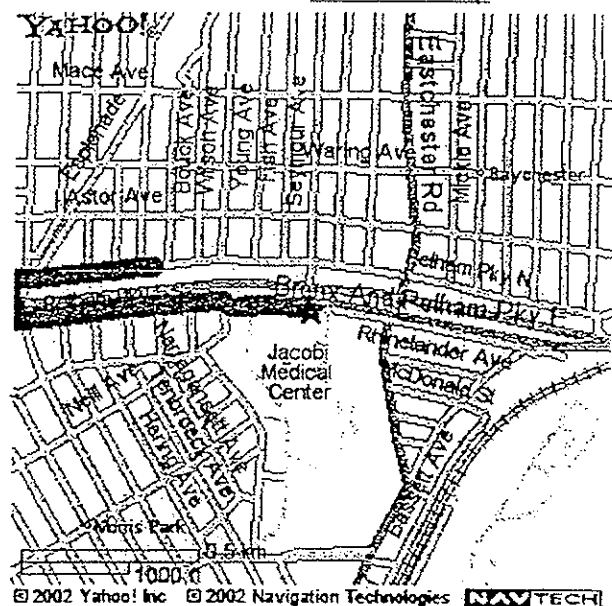
[Printable Version](#)

[Text Only Driving Directions](#)

Full Route



Destination - Interactive Map



Directions	Miles	
1. Start on PELHAM PKY N	0.3	↑
2. Turn Left on WILLIAMSBRIDGE RD	0.0	↙
3. Turn Left on BRONX AND PELHAM PKY E	0.4	↙
4. Continue on PELHAM PKY S	0.2	↑
Distance: 0.8 miles Approximate Travel Time: 2 mins		
When using any driving directions or map, it's a good idea to do a reality check and make sure the road still exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning.		

APPENDIX B

HAZARD COMMUNICATION AND MSDS SHEETS

APPENDIX b

HAZARD COMMUNICATION AND MSDS SHEETS

Hazard Communication

The Severn Trent safety representative will be in responsible charge of material hazard communication. Severn Trent shall ensure that all hazardous chemicals at the work site are labeled or tagged with the contents within, a hazard warning, manufacturer's name and stored properly.

~~The safety representative shall inform all workers of the hazards associated with each chemical used and shall be available.~~ MSDS and this HASP shall be on file at Severn Trent job site trailer.

Substances of concern on this project while working are:

- Pipe Dope
- Cutting Oil
- Solder and Flux
- Pesticides: Note: MSDS sheets from subcontractor should be added to this HASP.

Gases of concern are:

- Methane
- H₂S

MSDS SHEETS
FOR ORDER: 96533

SHIP-TO ADDRESS INFORMATION

: ENVIRONMENTAL LABS INC
: 200 ALLEN BLVD
: FARMINGDALE NY 11735

(COPY ONE)

LINE NUMBER : 001
PRODUCT CODE : 07022750 PC
CAS/MSDS NUMBER : M-22751
DESCRIPTION : METHANE IN NITROGEN

4. FIRST AID MEASURES

INHALATION: Immediately remove victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.

EYE CONTACT: None

SKIN CONTACT: None

INGESTION: None

IN EVENT OF EXPOSURE, CONSULT A PHYSICIAN

NOTE TO PHYSICIAN: None

5. FIRE FIGHTING MEASURES

FLASH POINT: Nonflammable

AUTOIGNITION TEMPERATURE: N/Ap

FLAMMABLE LIMITS: Nonflammable

LOWER:

UPPER:

EXTINGUISHING MEDIA: Use what is appropriate for surrounding fire.

SPECIAL FIRE FIGHTING INSTRUCTION AND EQUIPMENT: Keep fire exposed cylinders cool with water spray.

HAZARDOUS COMBUSTION PRODUCTS: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: Cylinder rupture may occur under fire conditions.

6. ACCIDENTAL RELEASE MEASURES

CLEAN UP PROCEDURES: Evacuate and ventilate area. Remove leaking cylinder to exhaust hood or safe outdoor area. Shut off source if possible and remove source of heat.

SPECIALIZED EQUIPMENT: None

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING: Secure cylinder when using to protect from falling. Use suitable hand truck to

PRECAUTIONS TO BE TAKEN IN STORAGE: Store in well ventilated areas. Keep valve protection cap on cylinders when not in use.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide adequate general and local exhaust ventilation to avoid asphyxiation.

PERSONAL PROTECTION

EYE/FACE PROTECTION: Safety glasses

SKIN PROTECTION: None

RESPIRATORY PROTECTION: In case of leakage, use self-contained breathing apparatus.

OTHER PROTECTIVE EQUIPMENT: Safety shoes when handling cylinders.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless

ODOR: Odorless

PHYSICAL STATE: Gas

VAPOR PRESSURE: N/Ap

VAPOR DENSITY (AIR=1): 0.968-0.926

BOILING POINT (C): N/Ap

SOLUBILITY IN WATER: Insoluble

SPECIFIC GRAVITY (H2O=1): Gas

EVAPORATION RATE: Gas

ODOR THRESHOLD: None

10. STABILITY AND REACTIVITY

STABILITY: Stable under normal storage conditions.

CONDITIONS TO AVOID: Storage in poorly ventilated areas. Storage near a heat source.

MATERIALS TO AVOID: Strong acids, oxidizers, and active metals. BrF₅, Cl₂, ClO₂, NF₃, liquid O₂, and OF₂. Nitrogen reacts with Li, Nd, and Ti at high temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

HAZARDOUS DECOMPOSITION: None

11. TOXICOLOGICAL INFORMATION

LETHAL CONCENTRATION (LC50): None established

LETHAL DOSE 50 (LD50): N/Ap

TERATOGENICITY: N/Ap

REPRODUCTIVE EFFECTS: N/Ap

MUTAGENICITY: N/Ap

12. ECOLOGICAL INFORMATION

No adverse ecological effects are expected.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Dispose of non-refillable cylinders in accordance with federal, state and local regulations. Allow gas to vent slowly to atmosphere in an unconfined area or exhaust hood. If the cylinders are the refillable type, return cylinders to supplier with any valve outlet plugs or caps secured and valve protection caps in place.

14. TRANSPORT INFORMATION

CONCENTRATION: 0.0001-11.9999%

DOT DESCRIPTION (US ONLY):

PROPER SHIPPING NAME: Compressed gases, n.o.s.

HAZARD CLASS: 2.2 (nonflammable)

IDENTIFICATION NUMBER: UN1956

REPORTABLE QUANTITIES: None

LABELING: NONFLAMMABLE GAS

ADR/RID (EU Only): Class 2, 1A

~~SPECIAL PRECAUTIONS:~~ Cylinders should be transported in a secure upright position in a well ventilated truck.

15. REGULATORY INFORMATION

OSHA: Process Safety Management:
Materials are not listed in appendix A of 29 CFR 1910.119 as highly hazardous chemicals.

TSCA: Mixture is not listed in TSCA inventory.

SARA: The threshold planning quantity

EU NUMBER: N/Ap

NUMBER IN ANNEX 1 OF DIR 67/548: Mixture is not listed in annex 1.

EU CLASSIFICATION: N/Av

R: 20

S: 9

16. OTHER INFORMATION

OTHER PRECAUTIONS: Protect containers from physical damage. Do not deface cylinders or labels. Cylinders should be refilled by qualified producers of compressed gas. Shipment of a compressed gas cylinder which has not been filled by the owner or with his written consent is a violation of federal law (49 CFR).

ABBREVIATIONS:

N/Ap - Not Applicable

N/Av - Not Available

SA - Simple Asphyxiant

NE - None Established

DISCLAIMER: Information included in this document is given to the best of our knowledge, however, no warranty is made that the information is accurate or complete. We do not accept any responsibility for damages by the use of the document.

MSDS SHEETS
FOR ORDER: 95112

SHIP-TO ADDRESS INFORMATION

: ENVIRONMENTAL LABS INC
: 200 ALLEN BLVD
: FARMINGDALE

NY 11735

(COPY ONE)

LINE NUMBER : 001
PRODUCT CODE : 0701601 A
CAS/MSDS NUMBER : 7783-06-4
DESCRIPTION : HYDROGEN SULFIDE C.P.GRD

4. FIRST AID MEASURES

INHALATION: Immediately remove victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.

EYE CONTACT: Immediately flush with copious amounts of water for at least 15 minutes.

SKIN CONTACT: Immediately flush with copious amounts of water for at least 15 minutes while removing contaminated clothing.

INGESTION: None

IN EVENT OF EXPOSURE, CONSULT A PHYSICIAN

NOTE TO PHYSICIAN: None

5. FIRE FIGHTING MEASURES

FLASH POINT: -60 deg.C

AUTOIGNITION TEMPERATURE: 260 deg.C

FLAMMABLE LIMITS: Vol. %

LOWER: 4.3

UPPER: 46

EXTINGUISHING MEDIA: Dry chemical or carbon dioxide. The only safe way to extinguish a H₂S fire is to stop the flow of gas.

SPECIAL FIRE FIGHTING INSTRUCTION AND EQUIPMENT: Wear self-contained breathing apparatus and full protective clothing. Keep fire exposed cylinders cool with water spray.

HAZARDOUS COMBUSTION PRODUCTS: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: Cylinder rupture may occur under fire conditions. Vapors may travel a considerable distance to the source of ignition and flash back. Emits toxic fumes under fire conditions. Fight fire from maximum possible distance.

6. ACCIDENTAL RELEASE MEASURES

CLEAN UP PROCEDURES: Evacuate and ventilate area. Remove leaking cylinder to exhaust hood or safe outdoor area. Shut off source if possible and remove source of heat.

SPECIALIZED EQUIPMENT: None

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING: Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders.

PRECAUTIONS TO BE TAKEN IN STORAGE: Store in well ventilated areas. Keep valve protection cap on cylinders when not in use. Store away from heat, flame, and sparks.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide adequate general and local exhaust ventilation to maintain concentrations below exposure and flammable limits.

PERSONAL PROTECTION

EYE/FACE PROTECTION: Safety glasses

SKIN PROTECTION: None

RESPIRATORY PROTECTION: In case of leakage, use self-contained breathing apparatus.

OTHER PROTECTIVE EQUIPMENT: Safety shoes when handling cylinders.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless

ODOR: Rotten egg smell.

PHYSICAL STATE: Gas

VAPOR PRESSURE: @20 deg.C: 18.5 atm

VAPOR DENSITY (AIR=1): 1.175

BOILING POINT (C): -60

SOLUBILITY IN WATER: Soluble

SPECIFIC GRAVITY (H₂O=1): Gas

EVAPORATION RATE: Gas

10. STABILITY AND REACTIVITY

STABILITY: Stable under normal storage conditions.

CONDITIONS TO AVOID: Storage in poorly ventilated areas. Storage near a heat source.

MATERIALS TO AVOID: Oxidizing materials, rubber, lead, silver, alkali metals, mercury, brass and copper.

HAZARDOUS POLYMERIZATION: Will not occur.

HAZARDOUS DECOMPOSITION: Sulfur oxides.

11. TOXICOLOGICAL INFORMATION

LETHAL CONCENTRATION (LC50): 712 ppm, rat 1 hour.

LETHAL DOSE 50 (LD50): N/Ap

TERATOGENICITY: N/Ap

REPRODUCTIVE EFFECTS: N/Ap

MUTAGENICITY: N/Ap

12. ECOLOGICAL INFORMATION

No adverse ecological effects are expected.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Dispose of non-refillable cylinders in accordance with federal, state and local regulations. Allow gas to vent slowly to atmosphere in an unconfined area or exhaust hood. If the cylinders are the refillable type, return cylinders to supplier with any valve outlet plugs or caps secured and valve protection caps in place.

14. TRANSPORT INFORMATION

CONCENTRATION: 99+%

DOT DESCRIPTION (US ONLY):

PROPER SHIPPING NAME: Hydrogen sulfide

HAZARD CLASS: 2.3 (poison), Hazard Zone B

IDENTIFICATION NUMBER: UN1053

REPORTABLE QUANTITIES: 100 lb.

LABELING: POISON GAS, FLAMMABLE GAS

SPECIAL PRECAUTIONS: Cylinders should be transported in a secure upright position in a well ventilated truck.

15. REGULATORY INFORMATION

OSHA: Process Safety Management: Material is listed in appendix A of 29 CFR 1910.119 as highly hazardous chemical.

TSCA: Material is listed in TSCA inventory.

SARA: The threshold planning quantity for this material is 512 lb.

EU NUMBER: 231-977-3

NUMBER IN ANNEX 1 OF DIR 67/548: Material is listed in annex 1.

EU CLASSIFICATION: N/Av

R: 13-26

S: 7/9-16-45

16. OTHER INFORMATION

OTHER PRECAUTIONS: Protect containers from physical damage. Do not deface cylinders or labels. Cylinders should be refilled by qualified producers of compressed gas. Shipment of a compressed gas cylinder which has not been filled by the owner or with his written consent is a violation of federal law (49 CFR).

ABBREVIATIONS:

N/Ap - Not Applicable

N/Av - No available

SA - Simple Asphyxiant

NE - None Established

DISCLAIMER: Information included in this document is given to the best of our knowledge, however, no warranty is made that the information is accurate or complete. We do not accept any responsibility for damages by the use of the document.

MSDS SHEETS
FOR ORDER: 96533

SHIP-TO ADDRESS INFORMATION

: ENVIRONMENTAL LABS INC
: 200 ALLEN BLVD
: FARMINGDALE

NY 11735

(COPY ONE)

LINE NUMBER : 001
PRODUCT CODE : 07022750 PC
CAS/MSDS NUMBER : M-22751
DESCRIPTION : METHANE IN NITROGEN

4. FIRST AID MEASURES

INHALATION: Immediately remove victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.

EYE CONTACT: None

SKIN CONTACT: None

INGESTION: None

IN EVENT OF EXPOSURE, CONSULT A PHYSICIAN

NOTE TO PHYSICIAN: None

5. FIRE FIGHTING MEASURES

FLASH POINT: Nonflammable

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS: Nonflammable

LOWER:

UPPER:

EXTINGUISHING MEDIA: Use what is appropriate for surrounding fire.

SPECIAL FIRE FIGHTING INSTRUCTION AND EQUIPMENT: Keep fire exposed cylinders cool with water spray.

HAZARDOUS COMBUSTION PRODUCTS: None

UNUSUAL FIRE AND EXPLOSION- HAZARDS: Cylinder rupture may occur under fire conditions.

6. ACCIDENTAL RELEASE MEASURES

CLEAN UP PROCEDURES: Evacuate and ventilate area. Remove leaking cylinder to exhaust hood or safe outdoor area. Shut off source if possible and remove source of heat.

SPECIALIZED EQUIPMENT: None

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING: Secure cylinder when using to protect from falling. Use suitable hand truck to

PRECAUTIONS TO BE TAKEN IN STORAGE: Store in well ventilated areas. Keep valve protection cap on cylinders when not in use.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide adequate general and local exhaust ventilation to avoid asphyxiation.

PERSONAL PROTECTION

EYE/FACE PROTECTION: Safety glasses

SKIN PROTECTION: None

RESPIRATORY PROTECTION: In case of leakage, use self-contained breathing apparatus.

OTHER PROTECTIVE EQUIPMENT: Safety shoes when handling cylinders.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless

ODOR: Odorless

PHYSICAL STATE: Gas

VAPOR PRESSURE: N/A

VAPOR DENSITY (AIR=1): 0.968-0.926

BOILING POINT (C): N/A

SOLUBILITY IN WATER: Insoluble

SPECIFIC GRAVITY (H2O=1): Gas

EVAPORATION RATE: Gas

ODOR THRESHOLD: None

10. STABILITY AND REACTIVITY

STABILITY: Stable under normal storage conditions.

CONDITIONS TO AVOID: Storage in poorly ventilated areas. Storage near a heat source.

MATERIALS TO AVOID: Strong acids, oxidizers, and active metals. BrF₅, Cl₂, ClO₂, NF₃, liquid O₂, and OF₂. Nitrogen reacts with Li, Nd, and Ti at high temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

HAZARDOUS DECOMPOSITION: None

11. TOXICOLOGICAL INFORMATION

LETHAL CONCENTRATION (LC50): None established

LETHAL DOSE 50 (LD50): N/Ap

TERATOGENICITY: N/Ap

REPRODUCTIVE EFFECTS: N/Ap

MUTAGENICITY: N/Ap

12. ECOLOGICAL INFORMATION

No adverse ecological effects are expected.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Dispose of non-refillable cylinders in accordance with federal, state and local regulations. Allow gas to vent slowly to atmosphere in an unconfined area or exhaust hood. If the cylinders are the refillable type, return cylinders to supplier with any valve outlet plugs or caps secured and valve protection caps in place.

14. TRANSPORT INFORMATION

CONCENTRATION: 0.0001-11.9999%

DOT DESCRIPTION (US ONLY):

PROPER SHIPPING NAME: Compressed gases, n.o.s.

HAZARD CLASS: 2.2 (nonflammable)

IDENTIFICATION NUMBER: UN1956

REPORTABLE QUANTITIES: None

LABELING: NONFLAMMABLE GAS

ADR/RID (EU Only): Class 2, 1A

SPECIAL PRECAUTIONS: Cylinders should be transported in a secure upright position in a well ventilated truck.

15. REGULATORY INFORMATION

OSHA: Process Safety Management:
Materials are not listed in appendix A of 29 CFR 1910.119 as highly hazardous chemicals.

FSCA: Mixture is not listed in TSCA inventory.

EU NUMBER: N/Ap

NUMBER IN ANNEX 1 OF DIR 67/548: Mixture is not listed in annex 1.

EU CLASSIFICATION: N/Av

R: 20

S: 9

16. OTHER INFORMATION

OTHER PRECAUTIONS: Protect containers from physical damage. Do not deface cylinders or labels. Cylinders should be refilled by qualified producers of compressed gas. Shipment of a compressed gas cylinder which has not been filled by the owner or with his written consent is a violation of federal law (49 CFR).

ABBREVIATIONS:

N/Ap - Not Applicable

N/Av - Not Available

SA - Simple Asphyxiant

NE - None Established

DISCLAIMER: Information included in this document is given to the best of our knowledge, however, no warranty is made that the information is accurate or complete. We do not accept any responsibility for damages by the use of the document.

Material Safety Data Sheet for Plastmo Heavy Bodied PVC Cement as supplied by IPS Corporation
revised July 1994

Section I

IPS Corporation

17109 S. Main St.

P.O. Box 379

Gardena, CA 90248

Transportation Emergencies

Chemtrec; (800) 424-9300

Medical Emergencies: (213) 222-3212 (LA. Poison Center 24hr.)

Business: (310) 366 3300

Chemical Name and Family

Solvent Cement for PVC Plastic

Mixture of PVC Resin and Organic Solvents

Trade Name

Weld-On #3121 PVC

Formula: Proprietary

Section II

None of the ingredients below are listed as carcinogens by IARC, NTP, or OSHA

CAS# APPROX% ACGIH-TLV ACGIH-STEL OSHA-PEL OSHA-STEL

Polyvinyl Chloride Resin(PVC) NON/HAZ N/A

Tetrahydrofuran (THF) 109-99-9 50-75 200 PPM 250 PPM 200 PPM 250 PPM

Methyl Ethyl Ketone (MEK) 78-93-3 5* 200 PPM 200 PPM 200 PPM 300 PPM

Cyclohexanone 108-94-1 1-10 25 PPM Skin

*Title III Section 313 Supplier Notification: This product contains toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right To Know Act of 1986 and of 40CFR372. This information must be included in all MSDS's that are copied and distributed for this material.

Shipping Information

DOT Shipping Name: Adhesive

DOT Hazard Class: 3

Identification Number: UN 1133

Packaging Group: II

Label Required: Flamable Liquid

Special Hazard Designations

	HMIS	NFPA
Health	2	2
Flamability	3	3
Reactivity	0	1

Protective Equipment: H

Hazard Rating: 0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe

SECTION III PHYSICAL DATA

Appearance: Clear, heavy syrupy liquid

Odor: Ethereal

Boiling Point: 151 deg. F Based on first boiling point component: THF

Specific Gravity: @ 73 +/- 2 deg. F, Typical 0.980 +/- 0.040

Vapor Pressure (mm Hg): 143 mm Hg. Based on first boiling component, THF @ 20 deg. C

Percent Volatile by Volume (%): Approx. 70-85%

Vapor density (Air=1): 2.49

Evaporation Rate (BUAC=1): > 1.0

Solubility in water: Solvent portion completely soluble in water Resin portion separates out

VOC Statement: VOC as manufactured: 760 grams/liter, Maximum VOC emission per SCAQMD Rule 1168, Test Method 316A: 560 Grams/Liter. Remains in joint

SECTION IV-Fire and Explosion Hazard Data

Flash Point: 6 deg. F T.C.C. Based on THF

Flammable Limits (% Volume): LEL= 2, UEL=11.8

Fire Extinguishing Media: Ansul "Purple K" potassium bicarbonate dry chemical, carbon dioxide, National Aer-O-Foam universal alcohol resistant foam, water spray.

Special Firefighting Procedures: Evacuate enclosed areas, stay upwind. Close or confined quarters require self-contained breathing apparatus, positive pressure hose masks or airline masks. Use water spray to cool containers, to flush spills from source of ignition and to disperse vapors.

Unusual Fire and Explosion Hazards: Fire hazard because of low flash point and high volatility. Vapors are heavier than air and may travel to source of ignition.

SECTION V HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: Inhalation and skin contact.

EFFECTS OF OVEREXPOSURE

ACUTE: Inhalation: Severe overexposure may result in nausea, dizziness, headache. Can cause drowsiness, irritation of eyes and nasal passages.

Skin Contact: Skin irritant. Liquid contact may remove natural skin oils resulting in skin irritation. Dermatitis may occur with prolonged contact.

Skin Absorption: Prolonged or widespread exposure may result in the absorption of harmful amounts of material.

Eye Contact: Overexposure may result in severe eye injury with corneal or conjunctival inflammation on contact with the liquid. Vapors slightly uncomfortable.

Ingestion: Moderately toxic. May cause nausea, vomiting, diarrhea. May cause mental sluggishness.

CHRONIC: Symptoms of respiratory tract irritation and damage to respiratory epithelium were reported in rats exposed to 5000 ppm THF for 90 days. Elevation of SGPT suggests a disturbance in liver function. The NOEL was reported to be 200 ppm.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Individuals with preexisting diseases of the eyes, skin or respiratory system may have increased susceptibility to the toxicity of excessive exposures.

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation: If overcome by vapors, remove to fresh air and if breathing stopped, give artificial respiration. If breathing is difficult, give oxygen. Call physician.

Eye Contact: Flush eyes with plenty of water for 15 minutes and call a physician.

Skin Contact: Remove contaminated clothing and shoes. Wash skin with plenty of soap and water for at least 15 minutes. If irritation develops, get medical attention.

Ingestion: Give 1 or 2 glasses of water or milk. Do not induce vomiting. Call physician or poison control center immediately.

SECTION VI - REACTIVITY -

STABILITY - Stable

CONDITIONS TO AVOID: Keep away from heat, sparks, open flame and other sources of ignition.

INCOMPATIBILITY: (MATERIALS TO AVOID) Caustics, ammonia, inorganic acids, chlorinated compounds, strong oxidizers and isocyanates.

HAZARDOUS DECOMPOSITION PRODUCTS: When forced to burn, this product gives out carbon monoxide, carbon dioxide, hydrogen chloride and smoke.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: ~~Keep away from heat, sparks, open flame and other sources of ignition.~~

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Eliminate all ignition sources. Avoid breathing of vapors. Keep liquid out of eyes. Flush with large amount of water. Contain liquid with sand or earth. Absorb with sand or nonflammable absorbent material and transfer in steel drums for recovery or disposal. Prevent liquid from entering drains.

WASTE DISPOSAL METHOD: Local, State and Federal regulations. Consult disposal expert. Can be disposed of by incineration. Excessive quantities should not be permitted to enter drains. Empty containers should be air dried before disposing. Hazardous Waste Code: 214

SECTION VIII - SPECIAL PROTECTION INFORMATION**RESPIRATORY PROTECTION** (Specify type)

Atmospheric levels should be maintained below established exposure limits contained in Section II. If airborne concentrations exceed those limits, use of a NIOSH-approved organic vapor cartridge respirator with full face-piece is recommended. The effectiveness of an air purifying respirator is limited. Use it only for a single short-term exposure. For emergency and other conditions where short term exposure guidelines may be exceeded, use an approved positive pressure self-contained breathing apparatus.

VENTILATION - Use only with adequate ventilation. Provide sufficient ventilation in volume and pattern to keep contaminants below applicable exposure limits set forth in Section II. Use only explosion proof ventilation equipment.

PROTECTIVE GLOVES: PVA coated.

EYE PROTECTION: Splashproof chemical goggles.

OTHER PROTECTIVE EQUIPMENT AND HYGIENIC PRACTICES: Impervious apron and a source of running water to flush or wash the eyes and skin in case of contact.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Store in the shade between 40 degrees F - 110 degrees F. Keep away from heat, sparks, open flame and other sources of ignition. Avoid prolonged breathing of vapor. Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Train employees on all special handling procedures before they work with this product.

OTHER PRECAUTIONS: Follow all precautionary information given on container label, product bulletins and our solvent cementing literature. All handling equipment should be electrically grounded.

Black Swan[®] Manufacturing Co.



Material Safety Data Sheet

Information on this form is furnished solely for the purpose of compliance with the Occupational Safety and Health Act and shall not be used for any other purpose. Black Swan Manufacturing Co. urges the customers receiving this Material Safety Data Sheet to study it carefully to become aware of the hazards, if any, of the product involved. In the interest of safety, you should notify your employees, agents, and contractors of the information on the sheet.

SECTION I - GENERAL INFORMATION				
Black Swan Manufacturing Co. 4540 W. Thomas Street Chicago, IL 60651-3318 Telephone No: 1-773-227-3700 Fax No: 1-773-227-3705		For chemical emergencies during transportation only call INFOTRAC 1-800-535-5053 24 hours per day - 7 days a week		
Date Prepared 5/6/99		Trade Name ALL PURPOSE PIPE DOPE		
SECTION II - HAZARDOUS INGREDIENTS / IDENTITY INFORMATION				
HAZARDOUS COMPONENTS	CAS#	APPROX%	ACGIH-TLV	OSHA-PEL
ISOPROPYL ALCOHOL	67630	10-15	400	400
ETHYLENE GLYCOL N-BUTYL ETHER	111-76-2	13-18	25	50
*Title III Section 313 Supplier Notification: this product contains toxic chemicals subject to the reporting requirements of Section 313 of the Emergency planning and community Right-to-Know Act of 1966 and of 40CFR372. This information must be included in all MSDS's that are copied and distributed for this material.				
SHIPPING INFORMATION		SPECIAL HAZARD DESIGNATIONS		
NOT HAZARDOUS FOR SHIPPING PURPOSES.		HEALTH FLAMMABILITY REACTIVITY PROTECTIVE EQUIPMENT	HMIS 0 2 0 A	HAZARD RATING 0 - MINIMAL 1 - SLIGHT 2 - MODERATE 3 - SERIOUS 4 - SEVERE
SECTION III - PHYSICAL DATA				

APPEARANCE	ODOR	BOILING POINT
LIGHT YELLOWISH PASTE	MILD	180° F
SPECIFIC GRAVITY (H ₂ O=1)	VAPOR PRESSURE (mm Hg.)	VOLATILE BY VOLUME (%)
1.41	(AT 25° C) .38	N/A
VAPOR DENSITY (AIR=1)	EVAPORATION RATE (BUAC=1)	SOLUBILITY IN WATER
>1	.6	SLIGHT

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	LEL	UEL
78° F (25° C) ASTM METHOD D93-80	(PERCENT BY VOLUME)	1.1%	10.6%

FIRE EXTINGUISHING MEDIA

CARBON DIOXIDE OR DRY CHEMICAL OR WATER.

SPECIAL FIRE FIGHTING PROCEDURES

NONE

UNUSUAL FIRE AND EXPLOSION HAZARD

CONTACT WITH STRONG OXIDIZERS MAY CAUSE FIRES OR EXPLOSIONS. CARBON MONOXIDE MAY BE

RELEASED.

SECTION V - HEALTH HAZARD DATA

PRIMARY ROUTES OR ENTRY ☒ Inhalation ☒ Skin contact ☐ Eye contact ☒ Ingestion

EFFECT OF OVEREXPOSURE

INHALATION: POSSIBLE DIZZINESS IF USED IN CONFINED AREA.

SKIN: MAY CAUSE MILD IRRITATION TO SENSITIVE SKIN.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

NONE

EMERGENCY AND FIRST AID PROCEDURES			
EYE CONTACT: FLUSH EYES WITH WATER.			
SKIN CONTACT: WASH CLOTHING BEFORE REUSE. WASH SKIN WITH SOAP AND WATER.			
INHALATION: REMOVE TO WELL VENTILATED AREA.			
INGESTION: CALL PHYSICIAN.			
SECTION VI - REACTIVITY			
STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	NONE
INCOMPATIBILITY (MATERIALS TO AVOID) LIQUID OXYGEN SYSTEMS, LIQUID SODIUM, GASEOUS FLUORINE, STRONG OXIDIZERS.			
HAZARDOUS DECOMPOSITION PRODUCTS NONE			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	NONE
SECTION VII - SPILL OR LEAK PROCEDURES			
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED			
NORMAL GOOD HOUSEKEEPING PROCEDURES.			
WASTE DISPOSAL METHOD			
DISPOSAL TO BE DONE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.			
SECTION VIII - SPECIAL PROTECTION INFORMATION			
RESPIRATORY PROTECTION (Specify type)			
AVOID BREATHING OF FUMES. IF USED IN CONFINED AREA A RESPIRATOR MAY BE NECESSARY.			
VENTILATION			
LOCAL EXHAUST - NORMAL VENTILATION IS ADEQUATE.			
PROTECTIVE GLOVES		EYE PROTECTION	
MAY BE NECESSARY FOR SENSITIVE SKIN.		KEEP OUT OF EYES. WEAR PROTECTIVE GOGGLES WHERE NECESSARY.	

Black Swan[®] Manufacturing Co.



Material Safety Data Sheet

Information on this form is furnished solely for the purpose of compliance with the Occupational Safety and Health Act and shall not be used for any other purpose. Black Swan Manufacturing Co. urges the customers receiving this Material Safety Data Sheet to study it carefully to become aware of the hazards, if any, of the product involved. In the interest of safety, you should notify your employees, agents, and contractors of the information on the sheet.

SECTION I - GENERAL INFORMATION				
Black Swan Manufacturing Co. 4540 W. Thomas Street Chicago, IL 60651-3318 Telephone No: 1-773-227-3700 Fax No: 1-773-227-3705		For chemical emergencies during transportation only call INFOTRAC 1-800-535-5053 24 hours per day - 7 days a week		
Date Prepared 7/19/99		Trade Name 95/5 SOLDER-N-FLUX		
SECTION II - HAZARDOUS INGREDIENTS / IDENTITY INFORMATION				
HAZARDOUS COMPONENTS	CAS#	APPROX%	ACGIH-TLV	OSHA-PEL
ANTIMONY	7440-36-0	1-5	0.5 mg/M3	
TIN	7440-31-5	60-85	2.0 mg/M3	
ZINC CHLORIDE	7646-85-7	3-5	1.0 mg/M3	
AMMONIUM CHLORIDE	12125-02-9	3-5	10.0 mg/M3	
<small>*Title III Section 313 Supplier Notification: this product contains toxic chemicals subject to the reporting requirements of Section 313 of the Emergency planning and community Right-to-Know Act of 1966 and of 40CFR372. This information must be included in all MSDS's that are copied and distributed for this material.</small>				
SHIPPING INFORMATION		SPECIAL HAZARD DESIGNATIONS		
NOT HAZARDOUS FOR SHIPPING PURPOSES.		HEALTH 2 FLAMMABILITY 0 REACTIVITY 0 PROTECTIVE EQUIPMENT B	HMIS HAZARD RATING 0 - MINIMAL 1 - SLIGHT 2 - MODERATE 3 - SERIOUS 4 - SEVERE	
SECTION III - PHYSICAL DATA				

APPEARANCE GRAY, SILVERY PASTE	ODOR NONE	BOILING POINT 2260° C ANTIMONY, 1635° C
SPECIFIC GRAVITY (H ₂ O=1) 4.03	VAPOR PRESSURE (mm Hg.) N/A	VOLATILE BY VOLUME (%) N/A
VAPOR DENSITY (AIR=1) N/A	EVAPORATION RATE (BUAC=1) N/A	SOLUBILITY IN WATER SLIGHTLY MISCIBLE

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOL USED)	FLAMMABLE LIMITS	LEL	UEL
N/A	(PERCENT BY VOLUME)	N/A	N/A

FIRE EXTINGUISHING MEDIA

CARBON DIOXIDE, DRY CHEMICAL OR FOG (WATER).

SPECIAL FIRE FIGHTING PROCEDURES

NONE.

UNUSUAL FIRE AND EXPLOSION HAZARD

WITH EXCESSIVE HEATING, MATERIAL COULD EMIT TOXIC FUMES.

SECTION V - HEALTH HAZARD DATA

PRIMARY ROUTES OR ENTRY _____ Inhalation ☒ Skin contact _____ Eye contact ☒ Ingestion

EFFECT OF OVEREXPOSURE

INGESTION: SEVERE DAMAGE TO INTERNAL ORGANS (ESOPHAGUS & PHYLORUS) WILL OCCUR IF SWALLOWED IN LARGE QUANTITIES. ANTIMONY IS STRONGLY IRRITATING TO MUCOUS MEMBRANES AND TO TISSUE.

INHALATION: DUST FROM DRIED DOWN PRODUCT CAN CAUSE INJURY TO RESPIRATORY TRACT. SEVERE EXPOSURE CAN CAUSE LUNG DAMAGE.

SKIN: PROLONGED CONTACT CAUSES BURNS, SKIN IRRITATION AND DISCOMFORT WITH RASH.

EYES: WILL CAUSE EYE IRRITATION WITH DISCOMFORT, TEARING OR BLURRING OF VISION.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

ADVANCED STAGES OF ANTIMONY POISONING MAY CAUSE FATTY DEGENERATION OF THE LIVER AND OTHER ORGANS. THE GASTROINTESTINAL TRACT SHOWS MARKED CONGESTION AND EDEMA.

EMERGENCY AND FIRST AID PROCEDURES

INGESTION: DO NOT INDUCE VOMITING IF CONSCIOUS, DILUTE BY GIVING LARGE QUANTITIES OF WATER OR MILK. CALL A PHYSICIAN IMMEDIATELY.

INHALATION: IF EXCESS DUST FROM DRIED PRODUCT IS INHALED REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH TO MOUTH. IF BREATHING IS DIFFICULT GIVE OXYGEN. CALL A PHYSICIAN.

SKIN: WASH AFFECTED SKIN AREA WITH SOAPY WATER. REMOVE CONTAMINATED CLOTHING. IF BURN OR RASH APPEARS CONSULT A PHYSICIAN.

EYE: IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR 15 MINUTES. CONSULT A PHYSICIAN.

SECTION VI - REACTIVITY

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	AVOID CONTACT WITH CONCENTRATED ALKALIES

INCOMPATIBILITY (MATERIALS TO AVOID)

ZINC CHLORIDE IS INCOMPATIBLE WITH CYANIDES & SULFIDE SALTS.

HAZARDOUS DECOMPOSITION PRODUCTS
WILL NOT OCCUR EXCEPT AT HIGH TEMPERATURES.

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	HIGH TEMPERATURES.

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

FLUSH WITH LARGE QUANTITIES OF WATER AND PICK UP WITH ABSORBING MATERIALS.

WASTE DISPOSAL METHOD

LANDFILL TO DISPOSE OF LARGE QUANTITIES. COMPLY WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.

SECTION VIII - SPECIAL PROTECTION INFORMATION**RESPIRATORY PROTECTION (Specify type)**

NOT REQUIRED FOR NORMAL USE.

VENTILATION

NONE

PROTECTIVE GLOVES	EYE PROTECTION
RUBBER GLOVES	SAFETY GOGGLES
OTHER PROTECTIVE EQUIPMENT AND HYGIENIC PRACTICES	
GLOVES WHILE HANDLING THE MATERIAL. WASH THOROUGHLY AFTER HANDLING.	
SECTION IX - SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	
IF HANDLING IN LARGE QUANTITIES, RUBBER GLOVES AND FACE SHIELD RECOMMENDED.	
OTHER PRECAUTIONS	
NONE.	
This information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof.	

- ☐ [Back to Home](#)
- ☐ [Back to List Price Sheet Index Page](#)
- ☐ [Back to MSDS Index Page](#)

Black Swan[®] Manufacturing Co.



Material Safety Data Sheet

Information on this form is furnished solely for the purpose of compliance with the Occupational Safety and Health Act and shall not be used for any other purpose. Black Swan Manufacturing Co. urges the customers receiving this Material Safety Data Sheet to study it carefully to become aware of the hazards, if any, of the product involved. In the interest of safety, you should notify your employees, agents, and contractors of the information on the sheet.

SECTION I - GENERAL INFORMATION																						
Black Swan Manufacturing Co. 4540 W. Thomas Street Chicago, IL 60651-3318 Telephone No: 1-773-227-3700 Fax No: 1-773-227-3705		For chemical emergencies during transportation only call INFOTRAC 1-800-535-5053 24 hours per day - 7 days a week																				
Date Prepared 7/19/99		Trade Name 50/50 SOLDER-N-FLUX																				
SECTION II - HAZARDOUS INGREDIENTS / IDENTITY INFORMATION																						
HAZARDOUS COMPONENTS	CAS#	APPROX%	ACGIH-TLV	OSHA-PEL																		
LEAD	7439-92-1	30-40	.05MG/M3																			
TIN	7440-31-5	30-40	2.0 mg/M3																			
ZINC CHLORIDE	7646-85-7	5-15	1.0 mg/M3																			
*Title III Section 313 Supplier Notification: this product contains toxic chemicals subject to the reporting requirements of Section 313 of the Emergency planning and community Right-to-Know Act of 1966 and of 40CFR372. This information must be included in all MSDS's that are copied and distributed for this material.																						
SHIPPING INFORMATION		SPECIAL HAZARD DESIGNATION																				
NOT HAZARDOUS FOR SHIPPING PURPOSES.		<table border="0"> <thead> <tr> <th></th> <th>HMIS</th> <th>HAZARD RATING</th> </tr> </thead> <tbody> <tr> <td>HEALTH</td> <td>2</td> <td>0 - MINIMAL</td> </tr> <tr> <td>FLAMMABILITY</td> <td>0</td> <td>1 - SLIGHT</td> </tr> <tr> <td>REACTIVITY</td> <td>0</td> <td>2 - MODERATE</td> </tr> <tr> <td>PROTECTIVE EQUIPMENT</td> <td>B</td> <td>3 - SERIOUS</td> </tr> <tr> <td></td> <td></td> <td>4 - SEVERE</td> </tr> </tbody> </table>				HMIS	HAZARD RATING	HEALTH	2	0 - MINIMAL	FLAMMABILITY	0	1 - SLIGHT	REACTIVITY	0	2 - MODERATE	PROTECTIVE EQUIPMENT	B	3 - SERIOUS			4 - SEVERE
	HMIS	HAZARD RATING																				
HEALTH	2	0 - MINIMAL																				
FLAMMABILITY	0	1 - SLIGHT																				
REACTIVITY	0	2 - MODERATE																				
PROTECTIVE EQUIPMENT	B	3 - SERIOUS																				
		4 - SEVERE																				

SECTION III - PHYSICAL DATA

APPEARANCE GRAY, SILVERY PASTE	ODOR NONE	BOILING POINT 418° F
SPECIFIC GRAVITY (H ₂ O=1) 4.03	VAPOR PRESSURE (mm Hg.) N/A	VOLATILE BY VOLUME (%) N/A
VAPOR DENSITY (AIR=1) N/A	EVAPORATION RATE (BUAC=1) N/A	SOLUBILITY IN WATER SLIGHTLY MISCIBLE

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	LEL	UEL
N/A	(PERCENT BY VOLUME)	N/A	N/A

FIRE EXTINGUISHING MEDIA

CARBON DIOXIDE, DRY CHEMICAL OR FOG (WATER).

SPECIAL FIRE FIGHTING PROCEDURES

NONE.

UNUSUAL FIRE AND EXPLOSION HAZARD

WITH EXCESSIVE HEATING, MATERIAL COULD EMIT TOXIC FUMES.

SECTION V - HEALTH HAZARD DATA

PRIMARY ROUTES OR ENTRY Inhalation ☒ Skin contact ☐ Eye contact ☒ Ingestion ☐

EFFECT OF OVEREXPOSURE

INGESTION: SEVERE DAMAGE TO INTERNAL ORGANS (ESOPHAGUS & PHYLORUS) WILL OCCUR IF SWALLOWED IN LARGE QUANTITIES.

INHALATION: DUST FROM DRIED DOWN PRODUCT CAN CAUSE INJURY TO RESPIRATORY TRACT. SEVERE EXPOSURE CAN CAUSE LUNG DAMAGE.

SKIN: PROLONGED CONTACT CAUSES BURNS, SKIN IRRITATION AND DISCOMFORT WITH RASH.

EYES: WILL CAUSE EYE IRRITATION WITH DISCOMFORT, TEARING OR BLURRING OF VISION.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

ADVANCED STAGES OF LEAD POISONING MAY CAUSE LOSS OF APETITE, CONSTIPATION, NAUSEA AND WEIGHT LOSS.

EMERGENCY AND FIRST AID PROCEDURES

INGESTION: DO NOT INDUCE VOMITING. IF CONSCIOUS, DILUTE BY GIVING LARGE QUANTITIES OF WATER OR MILK. CALL A PHYSICIAN IMMEDIATELY.

INHALATION: IF EXCESS DUST FROM DRIED PRODUCT IS INHALED REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH TO MOUTH. IF BREATHING IS DIFFICULT GIVE OXYGEN. CALL A PHYSICIAN.

SKIN: WASH AFFECTED SKIN AREA WITH SOAPY WATER. REMOVE CONTAMINATED CLOTHING. IF BURN OR RASH APPEARS CONSULT A PHYSICIAN.

EYE: IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR 15 MINUTES. CONSULT A PHYSICIAN.

SECTION VI- REACTIVITY

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	AVOID CONTACT WITH CONCENTRATED ALKALIES.

INCOMPATIBILITY (MATERIALS TO AVOID)

ZINC CHLORIDE IS INCOMPATIBLE WITH CYANIDES & SULFIDE SALTS.

HAZARDOUS DECOMPOSITION PRODUCTS

WILL NOT OCCUR EXCEPT AT HIGH TEMPERATURES.

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	HIGH TEMPERATURES.

SECTION VII - SPILL OR LEAK PROCEDURES**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

FLUSH WITH LARGE QUANTITIES OF WATER AND PICK UP WITH ABSORBING MATERIALS.

WASTE DISPOSAL METHOD

LANDFILL TO DISPOSE OF LARGE QUANTITIES. COMPLY WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

NOT REQUIRED FOR NORMAL USE.

VENTILATION

NONE

PROTECTIVE GLOVES

RUBBER GLOVES

EYE PROTECTION

SAFETY GOGGLES

OTHER PROTECTIVE EQUIPMENT AND HYGIENIC PRACTICES

GLOVES WHILE HANDLING THE MATERIAL. WASH THOROUGHLY AFTER HANDLING.

SECTION IX - SPECIAL PRECAUTIONS**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

IF HANDLING IN LARGE QUANTITIES, RUBBER GLOVES AND FACE SHIELD RECOMMENDED.

OTHER PRECAUTIONS

NONE.

This information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof.

- ☐ [Back to Home](#)
- ☐ [Back to List Price Sheet Index Page](#)
- ☐ [Back to MSDS Index Page](#)

Black Swan[®] Manufacturing Co.



Material Safety Data Sheet

Information on this form is furnished solely for the purpose of compliance with the Occupational Safety and Health Act and shall not be used for any other purpose. Black Swan Manufacturing Co. urges the customers receiving this Material Safety Data Sheet to study it carefully to become aware of the hazards, if any, of the product involved. In the interest of safety, you should notify your employees, agents, and contractors of the information on the sheet.

SECTION I - GENERAL INFORMATION				
Black Swan Manufacturing Co. 4540 W. Thomas Street Chicago, IL 60651-3318 Telephone No: 1-773-227-3700 Fax No: 1-773-227-3705		For chemical emergencies during transportation only call INFOTRAC 1-800-535-5053 24 hours per day - 7 days a week		
Date Prepared 5/24/99		Trade Name ALL PURPOSE LUBRICATING OIL		
SECTION II - HAZARDOUS INGREDIENTS / IDENTITY INFORMATION				
HAZARDOUS COMPONENTS	CAS#	APPROX%	ACGIH-TLV	OSHA-PEL
MINERAL OIL	64742-54-7	90+	5 mg/M3	5 mg/M3
*Title III Section 313 Supplier Notification: this product contains toxic chemicals subject to the reporting requirements of Section 313 of the Emergency planning and community Right-to-Know Act of 1966 and of 40CFR372. This information must be included in all MSDS's that are copied and distributed for this material.				
SHIPPING INFORMATION		SPECIAL HAZARD DESIGNATIONS		
NOT HAZARDOUS FOR SHIPPING PURPOSES.		HEALTH FLAMMABILITY REACTIVITY PROTECTIVE EQUIPMENT	HMIS 1 1 0 3	HAZARD RATING 0 - MINIMAL 1 - SLIGHT 2 - MODERATE 3 - SERIOUS SEVERE
SECTION III - PHYSICAL DATA				
APPEARANCE LIGHT BROWN OILY LIQUID	ODOR MILD ODOR	BOILING POINT 500° F		
SPECIFIC GRAVITY (H2O=1) 0.9	VAPOR PRESSURE (mm Hg.) 0.01	VOLATILE BY VOLUME (%) N/A		

VAPOR DENSITY (AIR = 1)	EVAPORATION RATE (GAL/H)	SOLUBILITY IN WATER
5	<0.01	VERY SLIGHT AT ROOM TEMPERATURE

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	LEL	UEL
400° F C.O.C.	(PERCENT BY VOLUME)	1	7

FIRE EXTINGUISHING MEDIA

CARBON DIOXIDE, WATER, SPRAY, FOAM, DRY CHEMICAL.

SPECIAL FIRE FIGHTING PROCEDURES

USE SELF CONTAINED BREATHING APPARATUS FOR FIGHTING FIRES IN ENCLOSED AREAS.

UNUSUAL FIRE AND EXPLOSION HAZARD

DIRECTLY SPRAYING EXTINGUISHING MEDIA ONTO HOT BURNING PRODUCTS MAY CAUSE FROTHING AND SPREADING OF FIRE.

SECTION V - HEALTH HAZARD DATA

PRIMARY ROUTES OR ENTRY ☒ Inhalation ☒ Skin contact ☒ Eye contact ☒ Ingestion

EFFECT OF OVEREXPOSURE

REDDING AND IRRITATION OF EYES OR SKIN.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

PRE-EXISTING DERMATITIS OR SKIN DISEASES.

EMERGENCY AND FIRST AID PROCEDURES

SKIN CONTACT: WASH WITH A MILD SOAP CONTAINING LANOLINE OR OTHER EMOLIENTS.

EYE CONTACT: FLUSH EYES WITH CLEAR WATER FOR 15 MINUTES AND CONTACT A PHYSICIAN IF IRRITATION PERSISTS.

SECTION VI - REACTIVITY

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	N/A

INCOMPATIBILITY (MATERIALS TO AVOID)
 AVOID CONTACT WITH STRONG OXIDANTS SUCH AS CHLORINE GAS

HAZARDOUS DECOMPOSITION PRODUCTS
 FUMES, SMOKE, CO_x, SO_x, NO_x WHEN COMBUSTED.

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	N/A

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

RECOVER FREE PRODUCT. ADD SAND, EARTH, OR OTHER ABSORBENT TO SPILL.
 MINIMIZE SKIN CONTACT. KEEP PRODUCT OUT OF SEWERS AND WATERWAYS.
 ADVISE AUTHORITIES IF PRODUCT HAS ENTERED OR MAY ENTER SEWERS,
 WATERCOURSES OR EXTENSIVE LAND AREAS.

WASTE DISPOSAL METHOD

DISPOSE OF MATERIAL IN A LICENSED LANDFILL OR INCINERATION FACILITY IN
 ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

ORGANIC VAPOR MASK SHOULD BE USED IF MACHANICAL VENTILATION IS
 INSUFFICIENT.

VENTILATION

LOCAL EXHAUST, MECHANICAL TO MEET TLV.

PROTECTIVE GLOVES

OIL RESISTANT GLOVES

EYE PROTECTION

USE SPLASH GOGGLES

OTHER PROTECTIVE EQUIPMENT AND HYGIENIC PRACTICES

USE CHEMICAL RESISTANT APRON TO AVOID CONTAMINATING REGULAR
 CLOTHING IF NEEDED.

WORKERS SHOULD WASH EXPOSED SKIN SEVERAL TIMES DAILY WITH SOAP AND
 WATER. SOILED WORK CLOTHING SHOULD BE LAUNDERED OR DRY CLEANED.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

STORE AWAY FROM HEAT, SPARKS AND OTHER IGNITION SOURCES. "EMPTY"
 CONTAINERS RETAIN RESIDUAL OIL. DO NOT PRESSURIZE, CUT, WELD, SOLDER,
 DRILL, GRIND OR EXPOSE DRUMS TO OTHER IGNITION SOURCES.

OTHER PRECAUTIONS

This information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof.

- ☐ [Back to Home](#)
- ☐ [Back to List Price Sheet Index Page](#)
- ☐ [Back to MSDS Index Page](#)

APPENDIX C

NYCDEP SAFETY POLICIES

SAFETY POLICIES AND GUIDELINES

4.1 OVERVIEW

A written, project-specific health and safety program (a "Program") shall be prepared and implemented by the Contractor responsible for Pelham Bay Landfill Post Closure Operations and Maintenance (the "O&M Contractor"). The Program shall be provided to the NYCDEP for review a minimum of 30 days prior to the start of O&M activities at the Site. This review by the NYCDEP does not constitute approval of the Program or relieve the O&M Contractor of any health and safety, or emergency response responsibilities. The safety policies and guidelines presented herein are suggestions designed to:

- Reduce the risk of employee injury and occupational illness;
- Satisfy regulatory requirements regarding health and safety; and,
- Satisfy NYCDEP health and safety and emergency response requirements.

All personnel involved with the operations and maintenance activities at the Site are required to comply with these policies and guidelines, and all applicable Federal, State and local laws and regulations. NYCDEP expects this commitment to health and safety from the O&M Contractor; failure to comply may result in disciplinary action.

4.2 FIELD PROGRAM ORGANIZATION

For this project, the responsibilities and authorities of the O&M Project Manager, the O&M Project Health and Safety Officer (the "Project Health and Safety Officer"), and O&M Site Safety Officer (the "Site Safety Officer"), related to health and safety, at a minimum, are as follows.

4.2.1 O&M Project Manager

Responsibilities

- Assures that work activities are performed in a manner consistent with current O&M Contractor and NYCDEP health and safety programs, and other relevant health and safety regulatory requirements;
- Assures that necessary project-specific Health and Safety Plans (HASPs), and Emergency Response Plans are prepared, submitted for review to the NYCDEP, and properly implemented;
- Implements necessary HASPs and Emergency Response Plans;
- Assures that adequate funds are allocated to fully implement project health and safety; and,
- Coordinates with the Project Health and Safety Officer on health and safety matters.

Authority (Safety Related)

- Assigns a Project Health and Safety Officer and, if necessary, a Site Safety Officer approved by the Project Health and Safety Officer;
- Suspends field activities if health and safety of personnel are endangered, pending an evaluation by the Project Health and Safety Officer; and,
- ~~Suspends an individual from~~ field activities for infractions of a HASP, pending an evaluation by the Project Health and Safety Officer.

4.2.2 O&M Project Health and Safety Officer

Responsibilities

- Interfaces with the O&M Project Manager in matters of health and safety;
- Develops necessary HASPs and/or Emergency Response Plans for the project for submittal to the O&M Project Manager for approval;
- Monitors compliance with approved HASPs;
- Assists the O&M Project Manager in seeing that proper health and safety equipment is available for the project; and,
- Approves personnel to work on the Site with regard to medical examinations and health and safety training.

Authority

- Suspends work or otherwise limits exposure to personnel if any HASP appears to be unsuitable or inadequate;
- Directs personnel to change work practices if these work practices are deemed to be hazardous to health and safety; and,
- Removes field personnel from the project if their actions or condition endangers their health and safety or the health and safety of co-workers.

4.2.3 O&M Site Safety Officer

Responsibilities

- Directs health and safety activities at the Site;
- **Completes Health and Safety Incident Reports, and reports within 24 hours of occurrence all safety related incidents or accidents to the Project Health and Safety Officer, O&M Project Manager and the NYCDEP Project Manager;**
- Assists the O&M Project Manager in all aspects of implementing HASPs and Emergency Response Plans;
- Maintains health and safety equipment at the Site;
- Implements emergency procedures as required; and
- Submits monthly and annual accident reports (e.g., OSHA 200 log).

Authority

- Temporarily suspends field activities if health and safety of personnel are endangered, pending an evaluation by the Project Health and Safety Officer; and,
- Temporarily suspends an individual from field activities for infractions of a HASP, pending an evaluation by the Project Health and Safety Officer.

The O&M Project Manager has overall responsibility for site safety; the Site Safety Officer has day-to-day responsibilities for monitoring and directing the Program. It is not necessary that three separate individuals be assigned the responsibilities described in this section. However,

when the O&M Contractor is working at the Site, one qualified individual must be designated as the Site Safety Officer and have the responsibilities and authorities set forth in Section 4.2.3.

4.2.4 Other Personnel

All field personnel shall be advised and trained in their safety responsibilities by the O&M Contractor. They shall be required by the O&M Contractor to comply with all the policies, procedures and permits applicable to the ongoing work. Safety responsibilities of individual workers include, but are not limited to, the following:

- Performing every job in a safe manner for the benefit of self, co-workers, other contractors or subcontractors, and public; and the protection of facilities;
- Immediately reporting every injury to the Site Safety Officer, regardless of severity;
- Reporting unsafe conditions and practices to a supervisor and correcting where possible;
- Participating in safety meetings and training;
- Assisting in reporting and investigating incidents, injuries and serious potential incidents; and,
- Reviewing and becoming familiar with the contents of the Program, all necessary HASPs and Emergency Response Plans, and pertinent safety manuals, handbooks and publications.

4.3 REGULATORY REQUIREMENTS

The health and safety information provided herein is intended to provide guidance to the O&M Contractor during performance of operations and maintenance activities at the Site. This information shall not be considered as all inclusive in regard to health and safety needs. The O&M Contractor is responsible for compliance with all Federal, State and local regulatory

requirements. These requirements include, but are not limited to, the following OSHA Regulations:

General Training	29 CFR 1926.21
First Aid	29 CFR 1910.15 1, 29 CFR 1910.1030, 29 CFR 1926.23
Emergency Action Plan	29 CFR 1910.38
Hazardous Waste Operations	29 CFR 1910.120
Fire Extinguishers	29 CFR 1910.157
Housekeeping	29 CFR 1910.22 , 29 CFR 1926.25
Illumination	29 CFR 1926.56
Hazard Communication	29 CFR 1910.1200, 29 CFR 1926.59
Noise/Hearing Conservation	29 CFR 1910.95, 29 CFR 1926.52
Personal Protective Equipment	29 CFR 1910.261, 29 CFR 1926.28
Confined Space Work	29 CFR 1910.146
Electrical Hazards	29 CFR 1926.403
Lockout/Tagout	29 CFR 1910.145
Elevated Work	29 CFR 1910.21
Ladders	29 CFR 1910.21, 29 CFR 1926.1053
Tools/Machinery	29 CFR 1926.301

Other safety requirements and guidelines shall be reviewed by the Project Health and Safety Officer for applicability to activities to be performed at the Site and possible implementation. This will include materials prepared by the following agencies and organizations:

- Mine Safety and Health Administration
- National Institute of Occupational Safety and Health
- American National Standards Institute, Inc.
- National Fire Protection Association
- New York State Department of Environmental Conservation
- New York City Department of Environmental Protection
- U.S. Environmental Protection Agency

- U.S. Army Corps of Engineers

The New York City Hazardous Materials Response Plan (the "NYC Response Plan") is provided in Appendix B. The O&M Contractor shall incorporate the provisions of the NYC Response Plan, as appropriate, in any necessary site-specific emergency response procedures. During the course of any emergency situation, the Site Safety Office is directly and solely responsible for determining the need to activate the NYC Response Plan.

4.4 GENERAL SAFETY RULES

The following general safety rules shall be reviewed, ~~implemented~~ and strictly adhered to by all workers, as appropriate:

- Immediately report all injuries or incidents to a supervisor. Attend to the injured or ill employee.
- All fires or spills or leaks of hazardous materials shall be reported immediately to a supervisor.
- All unsafe conditions shall be reported to a supervisor. Unsafe equipment shall be tagged with "DANGER - DO NOT OPERATE" tags.
- Whenever a safety device is disabled, removed from service, and/or defeated, a supervisor shall be notified and the device tagged.
- All visitors shall be authorized by the proper site representatives before entering or doing any work at the Site.
- Do not operate equipment for which you are not qualified.
- Horseplay or fighting on premises is prohibited.

- Smoking at the Site is not permitted except in designated areas which must be approved by the NYCDEP Project Manager. Eating or drinking is prohibited in the work areas of the Site.
- The use, possession, transportation or sale of illegal drugs, alcoholic beverages, fire arms, deadly weapons or explosives on the Site is prohibited.
- Use handrails and step one step at a time when ascending or descending stairs. Running is not allowed at the Site except in emergency.
- **When lifting loads** manually, use proper lifting techniques such as bending knees, obtaining assistance and mechanical lifting aids.
- Erect barricades around areas of hazardous work, such as work areas, trenches or overhead activities. Only the person in charge may grant permission for entry into these areas.
- Work platforms, approved scaffolding, ladders or safety harnesses shall be used if the work height is greater than 6 feet from ground level. Any high elevation (greater than 6 foot) work shall be done in a protected work platform with handrails, midrails, kick plates and flooring or the worker shall be protected from fall with a safety harness.
- All personnel, including visitors, and contractors and subcontractors, are required to wear hard hats and safety glasses with side shields while at the Site if overhead hazards exist.
- General footwear consisting of substantial shoes or boots with ANSI approved steel toes shall be worn at the Site. More protective footwear may be required in particular areas or for specific jobs.
- Hearing protection is required when the noise level exceeds 80 dBA.
- Use intrinsically safe and/or "spark-proof" equipment and tools while performing intrusive work in areas where potentially explosive levels of flammable gas may be present.

- If clothing becomes contaminated, the clothing shall be removed as soon as possible and potentially affected parts of the body thoroughly washed.
- Personal protective equipment shall be assigned and worn by personnel performing work requiring such equipment. Personal protective equipment shall be consistent with the Material Safety Data Sheets when handling hazardous materials.
- Use only proper tools and equipment maintained in good working condition.
- Fire extinguishers, alarm boxes, fire doors, eyewash stations, first aid kits and all other emergency equipment shall be in good condition, inspected regularly, and kept clear of obstructions.
- Operation of equipment having a "DANGER - DO NOT OPERATE" tag is prohibited.
- Under normal operations, all operating machinery and electrical switch gear shall have all required safety guards, switches and alarms in place and functional.
- When transferring flammable or combustible liquids into metal containers, the metal containers shall be grounded.

4.5 SAFETY STANDARDS

4.5.1 Hot Work

The following guidelines apply to maintenance or other tasks that are capable of producing a source of ignition and which are not directly connected with or controlled by normal operational activities. In general, hot work procedures are applicable to tasks involving sources of ignition and where flammable gas or vapor may exist.

Potential sources of ignition include, but are not limited to:

- Welding and cutting;
- Open flames;
- Hot tapping;
- Portable heaters;
- Internal combustion engines;
- Portable electrical tools;
- Grinding;
- Drilling;
- Chipping;
- Soldering;
- Excavators and other construction equipment;
- Sandblasting;
- Thawing frozen pipes; and,
- Freeing seized bearings.

The following general precautions should be followed, as appropriate, when performing hot work:

- Do not perform hot work unless absolutely necessary. Consideration should be given to relocating the work to a safe area whenever possible.
- Hot work shall be done under the supervision of persons who understand the fire and explosion potential. The hot work shall be performed by personnel sufficiently skilled to carry out the associated operations.
- Subcontracts should be made only with contractors who acknowledge understanding of hot work procedures and agree to have their employees abide by them. It is the responsibility of the O&M Project Manager to maintain liaison with other contractors and subcontractors on all matters relating to fire prevention.

- Monitor the area with a combustible gas indicator before starting hot work and while work is in progress. Combustible gas indicators shall be properly calibrated using a suitable calibration gas prior to use.
- Keep fire extinguishers and other appropriate fire fighting equipment close by. If applicable, designate a person as fire watcher to extinguish small fires. The work area should be observed for at least 30 minutes after completion of the work to be sure that no hot spots remain.
- ~~All bystanders shall be out of the area of exposure.~~
- Detailed planning is essential. The supervisor in charge should review the work to be done with personnel, describing pertinent safety and fire prevention measures to be taken.

Before allowing hot work to start, the supervisor in charge should verify that the following applicable conditions have been met, as appropriate:

- Piping connections have been blinded off or a section of pipe removed;
- Valves are tagged and locked out;
- Switches are tagged and locked out at breaker panel;
- Vessel or pipe are depressurized;
- Fire extinguishers are available;
- ~~Fire watchers have been designated;~~
- Flammable gas tests have been made (additional tests shall be made while the work is in progress); and,

- Vessels or pipelines have been vented and/or steamed, and are free of flammable gas.

An example of a Hot Work Permit is provided at the end of this section in Figure 4-1.

4.5.2 Lockout/Tagout.

Scope

Lockout/Tagout procedures are required when an unexpected release of energy such as electrical, hydraulic, pneumatic or mechanical could potentially cause injury to personnel. Lockout/Tagout procedures should be designed to prevent the unexpected release of energy.

An initial evaluation shall be performed to identify potential exposures that shall be isolated before working on equipment and affected personnel appropriately notified.

These procedures do not apply to minor tool adjustments or servicing activities that are routine, repetitive and integral to operations.

Electrical Lockout/Tagout Procedures

Electrical lockout/tagout procedures shall be used before commencing any work requiring personnel to work on or near de-energized circuit parts or equipment in any situation where there is danger of injury due to unexpected energizing or startup of equipment.

- The person doing the work shall **LOCK** open the circuit breaker(s) or approved disconnect device(s).
- TAG the lockout with a ~~label~~ and signed "DANGER-DO NOT OPERATE" tag. The reason for the lockout should be written on the tag.
- Other personnel working on this equipment shall attach their lock and tag.

- Each lock shall have only one key or a set of locks shall have one key. The key shall be held by the locking party until the job is completed.
- If a circuit cannot be locked out, it shall be de-energized and tagged. If the circuit requires disconnection or removal to ensure isolation, a qualified electrician shall perform the work.
- The equipment shall be tested at the on/off switch before beginning work after the locks are in place to confirm that the right circuit has been locked out.
- Only the person(s) originally attaching the lock and tag is authorized to remove the lock and tag ~~unless the person(s) is not available to remove the lock and tag.~~ **UNDER THESE CONDITIONS THE SUPERVISOR, AFTER CHECKING THE EQUIPMENT AND ASSUMING FULL RESPONSIBILITY, CAN REMOVE THE LOCK AND TAG AND PLACE THE EQUIPMENT IN SERVICE.** The supervisor is responsible for notifying personnel that their lock(s) and tag(s) have been removed.
- Personnel unlocking equipment to be energized are responsible for checking the work area to assure there is no hazard to personnel by starting/testing/re-energizing the equipment.

Process, Pneumatic and Hydraulic Lockout/Tagout Procedures

Process, pneumatic and hydraulic lockout/tagout procedures shall be used before commencing any work requiring personnel to work on or near any energy sources (e.g., process; hydraulic or pneumatic fluids, or thermal or chemical systems) where there is danger of injury due to the unexpected start-up of equipment.

The procedures for process, hydraulic and pneumatic lockout are essentially the same as the procedures for electrical lockout/tagout; the primary difference is in means of isolation.

Acceptable means of isolation (in order of preference) are as follows:

1. Blinding

2. Disconnection
3. Double block and bleed
4. Single block valve (valve shall be locked closed)
 - Valve shall not leak or have history of leaking
 - Not acceptable for:
 - High toxics;
 - High pressure;
 - Vessel entry; or,
 - Piping which shall be open for extended periods of time.

Mechanical Energy Lockout/Tagout Procedures

- If springs are involved, they shall be released or physically restrained when necessary to immobilize mechanical equipment.
- The use of brakes is not an acceptable means of energy isolation. The use of blocks or chains in addition to the brake is required.

Review

At least annually, a documented review of all lockout/tagout procedures for the Site shall be conducted.

At a minimum, this review shall include:

- Identification of the equipment to which the procedure applies;
- The date of the review;
- A list of the employees reviewed; and,
- The name of the supervisor ~~conducting~~ the review.

4.5.3 Confined Space Entry

This procedure establishes guidelines for preparation, entry and restoration of a confined space to be entered by personnel. These procedures are designed to maintain a safe environment for personnel working in a confined space. All work shall be performed in accordance with OSHA Regulations 29 CFR 1910.146, the Confined Space Standard, and any local regulations. Designation of confined spaces as either Permit Required Confined Spaces or Non-Permit Confined Spaces, and the determination of actual entry and emergency response procedures, is solely the responsibility of the O&M Contractor.

Scope

This procedure applies to excavations greater than 4 feet deep and to any confined space that is large enough to be entered bodily and has one or more of the following characteristics:

- Has limited or restricted openings for entry or exit;
- Contains or has a potential to contain a hazardous atmosphere;
- Is not intended for continuous occupation;
- Has insufficient natural ventilation; or,
- May contain known or potential hazards.

Confined spaces include, but are not limited to, storage tanks, frac tanks, tank trucks, process vessels, furnace boxes, sewer systems, ducts, flues, manholes, valve boxes, cellars, pipelines, pits, excavations or other areas that may contain toxic, corrosive, flammable, oxygen deficient or oxygen rich atmospheres.

Entry is defined as when any part of the entrant's head breaks the plane of an opening into a confined space.

Guidelines

The following guidelines are designed to assist the O&M Contractor in confined space entry work. As previously stated, determination of actual entry and emergency response procedures is solely the responsibility of the O&M Contractor. These guidelines have been developed primarily for entry into Permit Required Confined Spaces. The O&M Contractor is required to determine which of these guidelines pertain to entry into Non-Permit Confined Spaces.

Pre-Entry Procedure Guidelines

1. **The space shall first be isolated** using the following techniques, as appropriate:

- Blinding of lines as near the space as possible;
- Disconnecting of lines as near the space as possible; and,
- Double blocking and bleeding water and other non-hazardous lines.

A sketch of the space must be provided identifying the isolation and the technique used to achieve isolation. EVERY LINE MUST BE ISOLATED.

2. All electrical sources to the space shall be locked out using the procedures outlined in the Electrical Lockout/Tagout Procedures.
3. The confined space shall be cleared to remove vapors and contaminants.
4. Ventilation shall be established and maintained to ensure movement of fresh air in the confined space.
5. The atmosphere in the confined space shall be evaluated, as necessary, for the following:
 - Oxygen > 19.5 and < 23 percent
 - Flammable gases or vapors < 10 percent LEL

- Toxic vapors - as necessary
- Carbon monoxide < 5.0 ppm
- Hydrogen sulfide < 1.0 ppm
- Organic vapors < 25.0 ppm
- Benzene < 1.0 ppm
- Vinyl chloride < 1.0 ppm

The O&M Contractor is responsible for reviewing these levels for conformance with applicable standards at the time the work is actually performed. Calibrated instruments shall be used to make these evaluations.

The Site Safety Officer shall determine which chemicals should be measured in each particular confined space.

6. At least one properly trained and equipped "stand-by" person shall be posted outside the confined space. This stand-by person's job is to maintain communication with workers in the confined space and to summon help should it be required. This person shall not enter the confined space.
7. The need for a self-contained breathing apparatus or equivalent supplied air system shall be assessed by the Site Safety Officer. If determined to be necessary, it shall be positioned, in complete working condition, outside the confined space.
8. Lifelines, harnesses, wristlets or other appropriate retrieval equipment shall be worn by entrants. A mechanical retrieving device shall be made available for vertical spaces more than 5 feet deep.
9. Equipment such as air movers and vacuum truck hoses shall be properly grounded to prevent static sparks. Any electrical equipment used in the confined space should either be 12 volt DC or 120 VAC with ground fault interrupter.

10. Personal protective equipment such as coveralls, gloves, boots, safety glasses and hard hats shall be provided.
11. Personnel trained in first aid and CPR shall be available at the Site.
12. Appropriately sized fire extinguishers and other fire fighting equipment, if necessary, shall be available.
13. A communication system shall be established between the stand-by person, the entrants and site security personnel.
14. Signs and/or barricades shall be posted outside the confined space.
15. Entrants and standby persons shall be trained and familiar with the following:
 - Assigned duties;
 - Any hazardous material which may be present;
 - Reserve equipment;
 - Procedures and emergency contacts;
 - Communication systems; and,
 - Personal protective equipment.
16. Rescue services and the method of communicating with rescue services shall be listed on the permit.
17. A pre-entry safety meeting shall be held to discuss all the above items including the specific confined space to be entered.

Entry Procedure Guidelines

1. Entry may be made after all the items in Section 4.5.3 are completed and a Confined Space Entry Permit has been signed and issued. An example of a Confined Space Entry Permit is provided in Figure 4-2.
2. The stand-by person shall remain in the stand-by position unless adequately relieved. Unauthorized persons shall not be allowed entry.
3. ~~The atmosphere inside the confined space shall be continuously monitored and readings periodically recorded on the permit. If hot work is required in the confined space, a separate "Hot Work Permit" shall be issued.~~

4.6 ELECTRICAL SAFETY

The following electrical safety requirements shall be reviewed, implemented and strictly adhered to by all workers, as appropriate:

- Only qualified and trained personnel are allowed to repair or install electrical equipment.
- All conductors are considered to be energized.
- First aid and CPR trained people shall always be present at the Site when electrical work is being performed.
- All circuits shall be de-energized before beginning work. Refer to Lockout/Tagout, Section 4.5.2, for details of how to execute the lockout/tagout.
- Use suitable personal protective equipment including rubber gloves, mats and blankets to provide insulation from other elements which are energized or grounded. Rings, watches or other metallic objects shall not be worn while working on electrical equipment.

- Blown fuses shall be replaced only with the proper type and rating.
- Use of metal ladders is prohibited while working on or near electrical equipment or conductors.
- Defective electrical equipment should never be used.
- The use of field electrical equipment outdoors requires a GFI outlet.
- All power lines shall be considered energized unless proper measures have been taken for de-energizing overhead power lines. Any part of a crane, booms or other machinery shall not be permitted within 20 feet of power lines.

4.7 EMERGENCY PROCEDURES

4.7.1 General

Emergency procedures shall be available for emergency situations that could occur. Examples of situations requiring emergency procedures are fire, explosion, injury, spills of hazardous materials, toxic or combustible gas releases, or moving equipment accidents.

The O&M Project Manager is responsible that emergency procedures are available for emergency situations that may arise during operations at the Site and complying with the requirements of the New York City Hazardous Materials Response Plan (Appendix B).

All specific emergency procedures shall contain the following common elements:

- Internal/external communication;
- Accountability for all employees; and,
- Rescue procedures.

4.7.2 Training Requirements

Site personnel shall be thoroughly trained as follows:

- Drills of the emergency plan shall be performed every six months. Each drill execution shall be followed by a critique and a written report distributed to the O&M Project Manager, the Project Health and Safety Officer, and the NYCDEP Project Manager;
- Preparation of chain-of-custody forms;
- ~~Response to medical~~, fire or other emergencies;
- Evacuation routes; and,
- Location and use of emergency equipment.

4.7.3 Site Communications

A site communication system shall be established to warn all Site personnel if an emergency occurs. This system shall communicate the essentials needed for those individuals to protect themselves in an emergency. In addition, the communication system shall be able to effectively notify all the required outside entities should an emergency occur.

Specific emergency procedures shall be developed for the following:

- Fire/explosion;
- Medical emergency;
- Confined space entry rescue;
- Toxic/flammable release to atmosphere; and,
- Spills of hazardous material.

4.8 COMPRESSED GAS CYLINDERS

4.8.1 General Safety Procedures

- Do not move or store cylinders without the protective cap over the valve.
- Move cylinders with a cart or carrier for cylinders and get help as necessary.
- **Cylinders moved by a crane or derrick shall be secured in a basket. Use of slings, ropes or electromagnets is prohibited.**
- Cylinders should not be allowed to strike each other and should only be used to contain gas.
- Threads on a regulator or fitting shall correspond to those on the cylinder valve outlet.
- Always use a pressure reducing regulator on a cylinder unless the total system being discharged to is capable of handling the cylinder pressure.
- Never use oil or grease as a lubricant on valves or attachments to oxygen cylinders.

4.8.2 Storage of Cylinders

- Properly secure cylinders with chains, brackets or ropes to prevent falling.
- Do not store oxygen cylinders within 20 feet of combustible gas cylinders. Adjacent storage can be accomplished provided a 5 foot or higher wall separates the cylinders and the wall has a fire rating of 30 minutes or more.
- Store cylinders in a safe, dry, well ventilated area.
- Store empty and full cylinders separately and identify each as "full" or "empty".

4.9 INDUSTRIAL HYGIENE PROCEDURES

The objectives of these procedures are as follows:

- Protect the health of personnel and the public;
- Identify chemical stresses, physical and biological agents, and ergonomic hazards which can lead to occupational illnesses; and,
- Implement controls that prevent or minimize potential personnel exposures and/or illness.

Potential hazards at the Site shall be identified and evaluated and the following concerns addressed:

- A comprehensive and historical inventory of all potential chemical, physical and biological agents shall be developed and updated regularly.
- Potential exposures shall be identified by determining the chemicals that an individual may come in contact with, by job tasks and work practices.
- Potential exposures shall be evaluated by performance of industrial hygiene surveys.
- Exposure levels shall be communicated to all personnel.
- Recommendations for lowering exposures to acceptable levels shall be addressed and action plans developed for implementation.
- Proper toilets and clean break areas shall be provided for personnel working at the Site. A functioning shower shall be provided.

Individual monitoring and exposure records shall be maintained by the Site Safety Officer and made available to all employees.

4.10 HAZARD COMMUNICATION POLICY

4.10.1 General Company Policy

NYCDEP is committed to informing all employees of hazardous substances present in their places of work in accordance with the OSHA Hazard Communication (HAZCOM) requirements (OSHA Regulations 29 CFR 1920.1200 and 29 CFR 1926.59). This program applies to all work operations where workers may be exposed to hazardous substances.

Under the HAZCOM program, personnel working at the Site shall be informed by the O&M Contractor of the contents of the HAZCOM Regulations, the hazardous properties of chemicals with which they work, and safe handling procedures and measures to protect themselves from these chemicals.

4.10.2 Material Safety Data Sheets and Chemical Hazard Information

Material Safety Data Sheets (MSDS) provide specific information on the chemicals to which personnel working at the Site may be exposed. The MSDS should be a fully completed OSHA Form 174 or equivalent. Every effort shall be made by the O&M Contractor to obtain all pertinent MSDS or similar chemical hazard information whenever chemical exposure of personnel is possible.

The O&M Project Manager is responsible for acquiring and updating MSDS for chemicals present at the Site.

4.10.3 Labels and Other Forms of Warning_____

Hazardous chemicals used by personnel working at the Site shall be properly labeled. Original labels shall list the chemical's identity, appropriate hazard warnings, and the name and address

of the manufacturer. Reference shall be made to the corresponding MSDS to assist in verifying label information. Original labels shall not be defaced or removed.

If chemicals are transferred from a labeled container to a portable container that is intended only for immediate use, no labels are required on the portable container. However, no hazardous materials or chemicals should be permanently used or stored in unlabeled containers.

4.10.4 Training

All personnel who work with or who are potentially exposed to hazardous chemicals shall receive training on the Hazard Communication Standard requirements and the safe use of those chemicals.

Site personnel who are potentially exposed to hazardous chemicals or contaminated samples shall be trained in:

- The basic requirements of HAZCOM Regulations and employees' right to information on chemical hazards.
- The O&M Contractor's program to comply with HAZCOM requirements and procedures that must be followed, including reviewing the standard requirements, the company program, and MSDS recordkeeping procedures.
- How to interpret and use the labels on containers of hazardous materials.
- The potential physical hazards and health effects of the hazardous substances and how to use MSDS for more information.
- Methods and observations that may be used to detect the presence or release of chemicals.
- The measures that employees can take to protect themselves from chemicals.

All HAZCOM training shall be documented by a sign-in sheet recording each employee's attendance, the date, and the training topics covered. This sign-in sheet shall be retained by the Project Health and Safety Officer. Such training can be performed by any of the following individuals:

- O&M Project Manager,
- Project Health and Safety Officer, or,
- Site Safety Officer.

The ~~implementation~~ of the Hazard Communication Program shall be under the general direction of a Certified Industrial Hygienist.

4.10.5 Protective Measures

The use of chemical splash goggles, gloves, protective clothing, boots and, possibly, respiratory protection may be required during collection of potentially contaminated samples or the handling of hazardous chemicals. If respiratory protection is used, it shall be in full compliance with OSHA Regulations 29 CFR 1910.134 and 29 CFR 1926.103. All personal protective equipment used shall be in accordance with Subpart I of OSHA Regulations 29 CFR 1910 and Subpart E of OSHA Regulations 29 CFR 1926. Any emergencies involving hazardous chemicals or potentially contaminated samples shall be reported immediately to the O&M Project Manager, the Project Health and Safety Officer, and the NYCDEP Project Manager; and other designated personnel, as necessary, required by the NYC Response Plan.

4.11 INCIDENT/ACCIDENT INVESTIGATION PROCEDURE

The objectives of accident investigations are to determine the immediate and underlying causes of accidents and to recommend corrective actions to prevent similar incidents/accidents from occurring.

For purposes of this procedure, an accident/incident is defined as follows:

- Illness resulting from chemical exposure;
- Physical injury to personnel;
- Fire, explosion or flash from the Site;
- Property damage to the Site;
- Infractions of safety rules;
- Unexpected chemical releases or exposures; or,
- Complaints from neighbors concerning any part of the site operation.

The above list is ~~not~~ intended to be all inclusive but gives examples of accidents/incidents which ~~are~~ covered by this procedure.

The Health and Safety Incident Report Form presented in Figure 4-3, or an equivalent form, shall be used as the report format for incidents and accidents. The incident/accident shall be investigated by the Site Safety Officer and O&M Project Manager within 12 hours of occurrence. At the discretion of the O&M Project Manager and the Site Safety Officer, additional resources may be utilized to accomplish a successful accident investigation. Recommendations to prevent the accident in the future shall be included in the accident investigation report; copies of all pertinent documents must be provided to the NYCDEP Project Manager within 24 hours of the incident/accident.

REMEMBER: ACCIDENT INVESTIGATIONS GO BEYOND ASSESSING BLAME. IT IS IMPORTANT TO DETERMINE THE ROOT CAUSES OF ACCIDENT/INCIDENTS.

4.12 HEALTH AND SAFETY PLAN

In accordance with the requirements of OSHA Regulations including 29 CFR 1910.120 (Hazardous Waste Operations and Emergency Response) and local regulations, based on an evaluation by the O&M Contractor of the nature of the project, the work activities to be performed, and the hazards at the Site, a site-specific Health and Safety Plan and/or Emergency Response Plan may have to be prepared by the O&M Contractor. An outline of typical elements contained in a Health and Safety Plan is provided in Figure 4-4. The Health and Safety Plan(s) necessary for this project may differ substantially from this outline depending on the O&M

Contractor's evaluation. All HASPs necessary for work activities at the Site must be provided to the NYCDEP for review a minimum of two weeks prior to the start of these work activities. This review by the NYCDEP does not constitute approval of the HASP or relieve the O&M Contractor of any health and safety responsibilities.

FIGURE 4-1 HOT WORK PERMIT

Supervision, by signing and issuing this permit, certifies that all safety factors have been considered and cared for satisfactorily.

This permit becomes VOID:

- If work is not started within one (1) hour of issuance.
- If work is stopped for longer than one (1) hour.
- At the end of the shift of the production foreman who initiated the permit.
- If an emergency alarm is sounded in the building. (Permit is revalidated if the "All Clear" is sounded within one (1) hour.
- If a fire occurs in the building where this permit is issued.
- At the stated time: _____ am/pm.

Date _____ Time: Begin _____ a.m./p.m. End _____ a.m./p.m.

Operating Area: _____

Specific Equipment: _____

Work to be Done: _____

2. SYSTEM PREPARATION

Is the equipment or area satisfactorily clean of flammables?

Is the adjoining operation or equipment considered OK from standpoint of possible effect on job?

Have requirements of other procedures been met? (Look Out, Confined Space Entry, etc.)

Are proper fire extinguishers on the job?

Is sprinkler system operable?

Is water hose laid out and water running?

Are tarps needed to protect adjoining areas or personnel from sparks or arc flashes?

Is supply of fresh air needed for confined areas?

Are lower floors, pipe chases, floor drains protected?

Last chemical(s) in system: _____

Material Safety Data Sheet Available?

Other precautions? (Protective clothing and/or equipment, signs posted.)

Who is the fire watch? Name _____ Department _____

[illegible]

3. GAS TEST RESULTS

Production Supervision is responsible to prepare an area for gas test by flushing, purging, etc.

Is a gas test necessary? ☐ Yes ☐ No

Combustible gas test _____%

Other (Specify) _____

Combustible gas test must read "0" for any Hot Work to begin.

Gas Tester's Signature _____ Date _____ Time _____

4. APPROVAL

I approve this work to be done with the specified conditions.

Department Head/Designee/Shift Superintendent

Date _____ Time _____

We have personally checked the conditions specified. We authorize this Hot Work.

to begin _____ Date _____

Production Foreman

Date_____ Time_____

Maintenance Foreman

5. Any Extraordinary Occurrences: No / Yes, Explain: _____

6. Permit Complete _____ Date _____ Time _____ Job Complete _____ Date _____ Time _____

Production Foreman

Maintenance Foreman

White — Production; Canary — Maintenance; Tag — Safety

FIGURE 4-2 CONFINED SPACE ENTRY PERMIT

1. GENERAL

This permit becomes VOID:

- If work is not started within one (1) hour of issuance.
- If work is stopped for longer than one (1) hour.
- If an emergency alarm is sounded in the building. (Permit is revalidated if the "All Clear" is sounded within one (1) hour.
- If a fire occurs in the building where this permit is issued.
- At the end of the shift of the production foreman who initiated the permit.
- At the stated time: _____ am/pm.

Date _____ Time: Begin _____ am/pm End _____ am/pm

Equipment No. _____ Building No. _____ Location _____

Equipment Previously Contained: _____ MSDS Available: Yes / No

Work to be Done: _____

2. SYSTEM PREPARATION

Flame Permit required (Procedure 3b) (P) _____

System Entry Permit required (Procedure 3c) (P) _____

Lockout complete (Procedure 4a) (M) _____

Equipment Empty and Washed Out (P) _____

Top of equipment free of loose objects (M) _____

Special Clean-up for Diazo Kettle: _____ chemist's signature (P) _____

Other (Specify): _____

YES	NO	N/A

3. PERSONAL PROTECTIVE EQUIPMENT AND PRECAUTIONS (Circle those required)

Safety Glasses

Chemical Goggles

Face Shield

Rubber Boots

Rubber Gloves

Rubber Suits

Shower After Job

Air-line Respirator (ALR)

AIR with Escape Bottle

Self-Contained Breathing Apparatus

Safety Harness with Lifeline

Barrier Cream

Alert Whistle

Air Mover

Hearing Protectors

4. TESTS

	Instrument No.	Date of Calibration	Test Result	Time
Oxygen Deficiency	_____	_____	_____	_____ (M)
Flammability	_____	_____	_____	_____ (M)
Toxicity _____ chemical	_____	_____	_____	_____ (P)

Performed by: _____ Date _____

5. THIS CONFINED SPACE IS SAFE FOR MEN TO ENTER

Signature-Production Foreman _____ Date _____ Time _____

Signature-Dept. Head/Designee/Shift Superintendent _____ Date _____ Time _____

6. This Confined Space is Safe for Men to Enter, and the Following Men are Authorized to Enter it:

1. _____ 2. _____

SAFETY WATCHMAN IS: _____

Signature-Foreman of Above-Named Men _____

7. Extraordinary Occurrences: No / Yes, Explain: _____

8. Permit Complete _____ Date _____ Time _____ Job Complete _____ Date _____ Time _____

Production Foreman

Maintenance Foreman

White — Production; Canary — Maintenance; Tag — Safety

FIGURE 4-3
HEALTH AND SAFETY INCIDENT REPORT

Project Number _____ Date/Time of Incident _____

Project Name _____ Project Location _____

DESCRIPTION OF INCIDENT (Describe what happened and possible cause, identify individuals involved, witnesses, and their affiliations, and describe emergency or corrective action taken.)

Reporter: _____

Print Name

Signature

Date

Reporter shall deliver this report to O&M Project Manager within one day of the date of the incident for medical treatment cases and within five days for all other incidents.

Reviewed by: _____

Print Name

Signature

Date

Project Health and Safety Officer

Distribution:

_____ O&M Project Manager _____
_____ Site Safety Officer _____
_____ Personnel Manager (Medical Treatment Cases only), _____

FIGURE 4-4
HEALTH AND SAFETY PLAN OUTLINE

- 1.0 PROJECT IDENTIFICATION GENERAL**
- 2.0 INTRODUCTION AND PROJECT ORGANIZATION**
 - 2.1 SITE HISTORY AND BACKGROUND**
 - 2.2 KEY PERSONNEL AND RESPONSIBILITIES AND SAFETY RELATED AUTHORITY**
- 3.0 SCOPE OF WORK**
- 4.0 HAZARD ASSESSMENT**
 - 4.1 GENERAL HAZARD ASSESSMENT**
 - 4.2 CHEMICAL HAZARDS**
 - 4.3 PHYSICAL HAZARDS, HEAT STRESS, AND COLD EXPOSURE**
 - 4.4 BIOLOGICAL HAZARDS**
 - 4.5 FLAMMABLE HAZARDS**
 - 4.6 TASK-BY-TASK HAZARD ANALYSIS**
- 5.0 GENERAL HEALTH AND SAFETY REQUIREMENTS**
 - 5.1 MEDICAL SURVEILLANCE PROGRAM**
 - 5.2 TRAINING**
 - 5.3 INCIDENT REPORTING**
 - 5.4 ILLUMINATION, SANITATION AND CONFINED SPACE ENTRY**
 - 5.5 WORK PROCEDURES**
 - 5.6 RESPIRATOR MAINTENANCE, FITTING AND DECONTAMINATION**
 - 5.7 PROJECT MANAGER NOTIFICATION**
 - 5.8 PROJECT HEALTH AND SAFETY SUMMARY REPORT**
 - 5.9 OSHA INFORMATION POSTER**
 - 5.10 PROHIBITIONS**

5.11 INITIAL SITE SAFETY MEETING AND SIGNING OF HEALTH AND SAFETY PLAN COMPLIANCE AGREEMENT

5.12 DAILY SITE SAFETY BRIEFINGS

5.13 SITE SECURITY

5.14 HAZARD COMMUNICATION PROGRAM

5.15 UNDERGROUND STRUCTURES

6.0 AIR QUALITY MONITORING AND MITIGATIVE MEASURES FOR CONTROL OF EMISSIONS

6.1 AIR QUALITY MONITORING INSTRUMENTATION

6.2 DETERMINATION OF BACKGROUND AIR QUALITY LEVELS

6.3 AIR QUALITY MONITORING PROGRAM

6.4 MITIGATIVE MEASURES FOR CONTROL OF EMISSIONS

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 DESCRIPTION OF LEVELS OF PROTECTION

7.2 INITIAL LEVELS OF PROTECTION

8.0 DESIGNATION OF WORK ZONES

9.0 DECONTAMINATION PROCEDURES

9.1 PERSONNEL DECONTAMINATION PROCEDURES

9.2 EQUIPMENT, VEHICLE, AND FIELD INSTRUMENT DECONTAMINATION PROCEDURES

10.0 CONFINED SPACE ENTRY PROCEDURES

11.0 SPILL CONTAINMENT PROCEDURES

12.0 COMMUNITY PUBLIC HEALTH PRESERVATION

13.0 EMERGENCY RESPONSE PLAN

13.1 EMERGENCY RECOGNITION AND PREVENTION

13.2 EMERGENCY ALERTING PROCEDURES

13.3 SITE SECURITY, SITE CONTROL, VISITORS AND SITE EVACUATION PROCEDURES

13.4 EMERGENCY TELEPHONE NUMBERS

13.5 EMERGENCY RESPONSE PERSONNEL, EQUIPMENT AND PROCEDURES

13.6 EMERGENCY DECONTAMINATION PROCEDURES

13.7 ON-SITE MEDICAL TREATMENT AND EMERGENCY FIRST AID PROCEDURES

13.8 DIRECTIONS TO EMERGENCY MEDICAL FACILITY FROM SITE

14.0 SAMPLING AND LABORATORY CONSIDERATIONS

15.0 PERSONNEL ASSIGNMENTS

16.0 HEALTH AND SAFETY PLAN APPROVALS

17.0 HEALTH AND SAFETY PLAN COMPLIANCE AGREEMENT

APPENDIX D

SITE EMERGENCIES AND CONTINGENCY PLAN

EMERGENCIES AND CONTINGENCY PLAN

6.1 GENERAL

6.1.1 Emergencies

The O&M Contractor shall prepare an Emergency Response Plan as part of the Health and Safety Program described in Section 4.0 that addresses emergency situations. This plan shall be kept in a prominent, readily accessible place in the O&M Contractor's trailer. It is the responsibility of the O&M Contractor to familiarize his employees, subcontractors and other personnel involved in the on-site Operations and Maintenance with the Emergency Response Plan and Procedures. Incidents/Emergencies that are to be addressed by the Emergency Response Plan shall include, but not be limited to, the following:

- Toxic substance exposure
- Fire/Explosion
- Hazardous material spill
- Personnel injury

In the event that a life threatening emergency occurs, the O&M Contractor is responsible that his/her personnel and subcontractors follow the Contractor's Emergency Response Plans and Procedures.

6.1.2 Contingencies

Other situations may occur at the Site that will require corrective actions to be implemented in an expedited manner (i.e., contingencies). Not all potential situations of this nature can be foreseen or described here. Some of the situations include, but are not limited to, the following:

- Gas system shut down
- Leachate tank overflow
- Excessive Settlement of Cap
- High leachate level along the cutoff wall
- Power failure for an extended period of time
- Broken Force Main
- Sideslope failure
- Stormwater system failure
- Seepage from side slopes

In ~~most instances~~, the five step process, outlined below, shall be followed. For the contingency situations listed above, the instructions outlined in Section 6.3 shall be performed immediately to prevent further complications before an appropriate corrective action is implemented.

6.2 CORRECTIVE ACTION PROCESS

The O&M Contractor shall take the following steps to resolve contingency problems:

1. Identify/verify the problem and its cause. If possible, the O&M Contractor shall make a preliminary assessment of the severity of the problem. Immediate steps shall be taken to contain the problem, if necessary.
2. Notify the proper authorities depending on the severity of the problem. At a minimum, the O&M Project Manager shall be notified, who, in turn, shall inform the NYCDEP Project Manager. The NYSDEC shall be notified of any of the incidents/emergencies or contingency items listed in Section 6.1. The O&M Project Manager shall initiate a decision-making process for a course of action. Appropriate local/state/federal agencies shall also be contacted, as necessary. Emergency telephone numbers are included in Table 6-1.

3. Make recommendations to the NYCDEP, as appropriate, for corrective actions and a schedule for implementation. If necessary, a more detailed assessment of the problem and evaluation of alternatives for corrective action shall be undertaken by the O&M Contractor, subject to the approvals of the NYCDEP.
4. Obtain authorization from the NYCDEP for the O&M Contractor to implement any corrective action(s).
5. Implement a proper, safe and effective corrective action by the O&M Contractor at the direction of the NYCDEP.

6.3 CONTINGENCY PROCEDURES

The following instructions shall be followed for the contingency situations listed in Section 6.1.

6.3.1 Gas System Shutdown

A **potential hazardous** situation exists if the active gas extraction system is shut down or not operating properly. This can occur if the blowers are turned off, the flare is extinguished, or the gas header system becomes plugged.

In the event the active gas system is not drawing gas to the flare, gas can build up beneath the geomembrane liner. After a period of time, the gas pressures may be enough to lift portions of the liner and soil cover. This can potentially lead to slope instability, a ruptured liner or other serious problems.

In the event the active gas system is not drawing gas to the flare, the following action should be taken:

- Restart the gas blowers and flare following the instructions in Volume III, Section 5.

If the blowers and flare do not restart

- Notify NYCDEP of the situation within 4 hours.
- Remove vent caps from the six passive vents and 22 gas extraction wells.
- Contact a representative of the John Zink Co. to examine the system.
- Repair or replace blowers as necessary.
- Repair flare as necessary.
- Repair flare control system as necessary.
- Bring blowers and system back on-line as soon as possible.
- **Re-seal** passive vents and extraction wells.

When blowers and flare systems are brought on-line, the passive gas vents and gas extraction wells must be resealed to avoid pulling oxygen into the system. Immediately after the flare system is running, check all gas extraction wells for vacuum pressure readings. If vacuum is not recorded at each well head, check that all valves are properly set. The piping system shall also be checked for blockages or condensate filling the lines. This shall be done by identifying the potential gas lines that could be plugged (based on the problematic well heads). Field check the gas header pipe alignment for settlement or indications of low spots that could be trapping condensate.

If low spots are identified, regrade area and reset gas collection piping to drain. Close valves to the lines being repaired and observe proper Health and Safety guidelines when performing work on any gas lines to avoid flammable or explosive conditions.

6.3.2 Leachate Tank Overflow

The leachate holding tank may overflow if, for example, the level controller in the leachate tank fails to shut off the well pump when the leachate tank reaches its high level. The following initial steps shall be taken in response to a leachate tank overflow:

- Cease operation of all pumps.

- Assess the extent of the leachate tank overflow and contamination of the area around the tank.
- Identify possible cause(s) of overflow and corrective actions that may be necessary.
- Assess the need to set up emergency hauling in coordination with the NYCDEP.
- Set up emergency hauling of the leachate from the tank if so directed by the NYCDEP.
- Implement emergency remediation procedures if so directed by the NYCDEP.
- Implement procedures to correct the cause of the tank overflow.

6.3.3 Excessive Settlement of Cap

In the event of severe differential settlement of the cap, the following steps should be taken:

- Modify, cancel or delay all activities (e.g., mowing, fertilizer application, monitoring, etc.) in the immediate vicinity of the settlement.
- Initiate the Corrective Action process described in Section 6.2.

6.3.4 Sideslope Failure

In the event of a sideslope failure, immediately notify NYCDEP and follow the Corrective Action Process in Section 6.2. Document the sideslope failure both with photographs and location markings on the record drawings. Design modifications may be warranted to avoid a repeat of the failure. Identify the cause and suitable remedy prior to repairing the slope. In the interim, take temporary measures to reinstate the stormwater collection system across the failed slope. The slope should be remediated in a timely fashion to avoid other problems (i.e. refuse exposure or erosion that are related to unprotected slopes).

6.3.5 Stormwater System Failure

Stormwater system failures may be caused by many factors. For example, stormwater connection piping, pond connection piping or inlet/outlet structures could be clogged. A precipitation event exceeding the design capacity (about 6" of rainfall in 24 hours) could have

occurred. Frozen water may have blocked part of the conveyance systems during snow melt. Inspect and repair any blockages or failed stormwater pipings and repair.

The O&M Contractor shall contact the NYCDEP and follow the Corrective Action Process in Section 6.2.

6.3.6 Seepage from Sideslopes

Any water seeping from the sideslopes is a serious condition. The saturated conditions and erosion from seeps can eventually lead to progressive slope failure. Seepage from side slopes may indicate an accumulation of leachate beneath the cover and a failure in the geomembrane liner. Seeps represent an escape of contamination from the landfill containment and are of environmental concern. More likely a seep will be caused by infiltration surface water building up over the geomembrane and saturating the sideslope.

Inspect the area for the source of the seepage and hand excavate to the geocomposite surface.

Check the water quality of the samples of the seepage by performing an analysis similar to that for groundwater samples (See Volume III, Section 4.0).

If the seepage is not leachate, there is probably a blockage of the infiltration drainage trench, 6" diameter HDPE corrugated slotted piping or geocomposite. Excavate and remove the geocomposite along the slope in the saturated area down to and including the infiltration drainage trench at the base of the slope. Check and repair or replace the 60 mil HDPE geomembrane if damaged. Use like materials and replace all geocomposites and cover soils in accordance with the requirements of the record drawings and specifications for Contract HP-876.

If the seepage is leachate, contact the NYCDEP and follow the Corrective Action Process in Section 6.2.

6.3.7 High Leachate Levels Along Cutoff Wall

A high level of leachate along the cutoff wall may indicate that the downgradient drain is not functioning properly. The high level of leachate could cause leachate to migrate laterally around the cutoff wall, primarily towards Pelham Bay Park and Eastchester Bay. If leachate levels reach elevation 5.0, it can cause uplift at the base of Sedimentation Pond A and create a risk of contaminating stormwater.

The following initial steps shall be taken in response to high leachate levels along the cutoff wall:

- Notify NYCDEP
- Check that all pumps in Containment Sumps D-1, D-8, and D-10 are operational. Repair as necessary.
- Check that Lift Station No. 2 pumps are operational.
- Check that leachate is flowing through the downgradient drain to Collection Sumps D-1, D-8 and D-10 and to Manholes D-2 through D-7 and D-9.
- If leachate is not flowing to these manholes, the drain pipes may have become plugged and should be cleaned using high pressure pipe cleaning equipment.
- Repair sections of downgradient drain that are damaged or cannot be unplugged. Repair in accordance with record drawings and specifications for Contract HP-875.
- Follow the Corrective Action Process in Section 6.2.

6.3.8 Broken Force Main

A broken force main carrying leachate can create a potential environmental release. A broken force main may be identified by loss of pressure in force main pumps or by evidence of settlement or erosion on the surface above the force main. Immediately notify NYCDEP of any force main break and shut down pumps to the force main. Locate the break. Repair the break with like materials and test piping in accordance with the record drawings and specifications for Contract HP-875 or HP-877, as appropriate. Remove all contaminated materials and dispose of off-site at a disposal facility approved by the NYCDEP.

6.3.9 Power Failure for an Extended Period of Time

If power failure is expected for an extended period of time, contact the NYCDEP and mobilize portable generating units to provide temporary power to the gas collection and flaring control systems. Hook up to the automatic transfer switch should be provided by a qualified electrician. Inspect operations on a daily basis while temporary generators are supplying power to the control systems. Keep generators properly fueled and lubricated for continued operation until permanent power is restored.

6.4 EMERGENCY CONTACTS

Table 6-1 lists some telephone numbers for emergency contacts. In the event of an emergency, the automatic dialer at the site can be used.

The O&M Contractor's attention is also directed to the NYCDEP Emergency Response Manual. The O&M Contractor shall thoroughly review the manual and become familiarized with its contents and the NYC Emergency Response Procedures. The O&M Contractor is responsible for initiating the Emergency Response Procedure if an emergency incident occurs.

6.5 DIRECTIONS TO THE JACOBI MEDICAL CENTER

In case of an emergency, the O&M Contractor should be aware of the proper evacuation and/or medical treatment procedures outlined in the site specific Health and Safety Plan. In the event of a medical emergency, the route to Jacobi Medical Center is detailed below:

- Exit site and get onto Shore Road (Pelham Parkway) southbound.
- Continue southbound on Pelham Parkway; exit onto Wilson Avenue (southbound) left after about 1.25 miles.

- Jacobi Medical Center will be on the left hand side; enter at Emergency Room entrance off of Wilson Avenue.

A map of the route to Jacobi Medical Center from the Site is provided in Figure 6-1. All O&M field personnel should be familiar with the route to be followed to the Hospital in case of the occurrence of any medical emergency.

TABLE 6-1
EMERGENCY CONTACTS AND TELEPHONE NUMBERS
PELHAM BAY LANDFILL

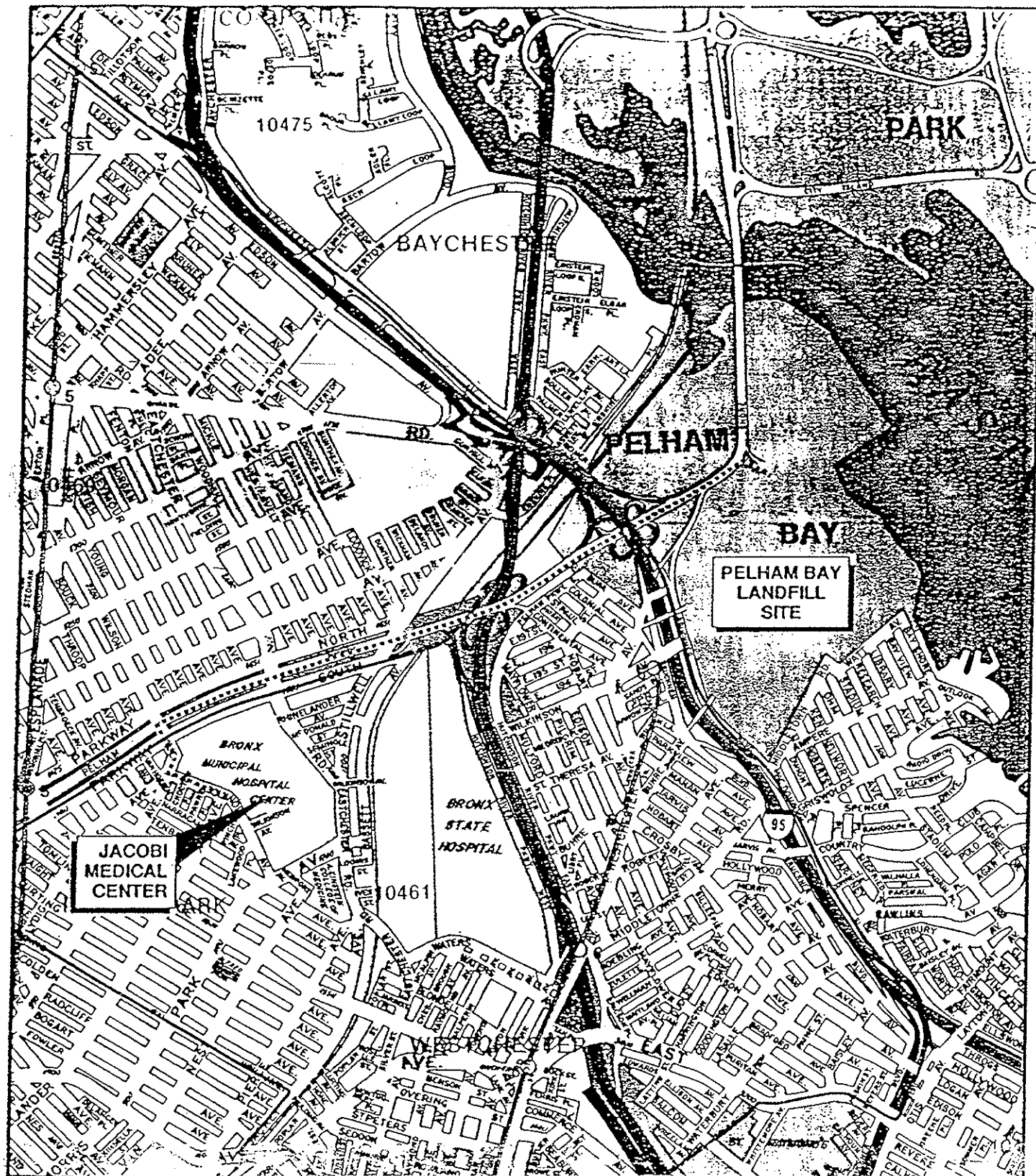
AutoDialer at Site	N/A
Ambulance	911
Fire Department	911 or (718) 430-0266
Police Department	911 or (718) 822-5411
Jacobi Medical Center	(718) 918-5000
Poison Control Center	(800) 962-1253
USEPA National Response Center	(800) 438-2427
U.S. Coast Guard	(800) 424-8802
Security Guard Trailer	(718) 597-1150
NYS Spill Hotline	(718) 482-4900 411
Chemtrec	(800) 0424-9300

John Wuthenow, Director	26
NYCDEP Div. of Hazmat Management	(718) 595-44 46
David Torney, Project Manager	718-595-7706
Lin Kan, Director	
NYCDEP Landfill Remediation	(718) 595-3635

NYCDEP Div. of Hazmat Management (718) 595-3767

~~Mustafa Fawzy, Director~~
 HazMat Emergency Response ~~(718) 595-4610~~ 411

NYCDEP Communications Center ~~(718) 595-4700~~ 411
~~Woodward-Clyde Consultants, Inc. U.P.S.~~ ~~(212) 926-2878~~ 212-594-2118
~~Prime Contractor~~ ~~634-6032~~
 Leachate Hauler 26M-631-586-002
 Collection Tank Cleaner
 Other Subcontractors



0 1421 2842 FT
SCALE

FIGURE 6-1

ROUTE TO JACOBI MEDICAL CENTER

APPENDIX E

INSPECTION LOG/SAFETY CHECKLIST

SAFETY CHECK LIST
COMPLETED BY SAFETY REPRESENTATIVE

CONTRACTOR: _____

JOB SITE LOCATION: _____ PROJECT #: _____

PROJECT MANAGER'S NAME _____

TOTAL NUMBER OF WORKERS _____ NAME OF EVALUATOR _____

FOR PERIOD OF _____ DATE OF REPORT _____

TYPE OF REPORT -FINAL- -QUARTERLY- -MONTHLY- SPOT CHECK (CIRCLE ONE)

A. HEALTH AND ENVIRONMENTAL

	<u>POOR</u>	<u>FAIR</u>	<u>GOOD</u>	<u>EXCEL</u>	<u>SEVERITY POINTS</u>
1. FIRST AID SERVICE	_____	_____	_____	_____	_____
2. SANITATION	_____	_____	_____	_____	_____
3. NOISE CONTROL	_____	_____	_____	_____	_____
4. AIR QUALITY CONTROL	_____	_____	_____	_____	_____
5. ILLUMINATION	_____	_____	_____	_____	_____
6. HEAT STRESS CONTROL	_____	_____	_____	_____	_____
7. CONFINED WORK SPACE PROC.	_____	_____	_____	_____	_____

B. PERSONEL PROTECTIVE EQUIPMENT

1. HEAD	_____	_____	_____	_____	_____
2. HEARING	_____	_____	_____	_____	_____
3. EYE AND FACE	_____	_____	_____	_____	_____
4. FALL PROTECTION	_____	_____	_____	_____	_____
5. RESPIRATORY	_____	_____	_____	_____	_____
6. WORKING APPAREL	_____	_____	_____	_____	_____

C. FUEL AND FLAMMABLES

1. FIRE FIGHTING EQUIPMENT & LOCATION	_____	_____	_____	_____	_____
2. FUEL/FLAMMABLE STORAGE	_____	_____	_____	_____	_____
3. FUEL/FLAMMABLE TRANSFERS	_____	_____	_____	_____	_____
4. BONDING/GROUNDING	_____	_____	_____	_____	_____

D. SIGNS, SIGNALS AND BARRICADES

1. DANGER SIGNS	_____	_____	_____	_____	_____
2. FLAG PERSON	_____	_____	_____	_____	_____
3. BARRICADES	_____	_____	_____	_____	_____

E. RIGGINGS, EQUIPMENT (SLINGS/SPREADERS/COME ALONG/ETC.)

1. USE	_____	_____	_____	_____	_____
2. STORAGE	_____	_____	_____	_____	_____
3. CONDITION	_____	_____	_____	_____	_____

F. TOOLS

	<u>POOR</u>	<u>FAIR</u>	<u>GOOD</u>	<u>EXCEL</u>	<u>SEVERITY POINTS</u>
1. GUARD	_____	_____	_____	_____	_____
2. PRESSURE SWITCHES	_____	_____	_____	_____	_____
3. HAND	_____	_____	_____	_____	_____
4. ELECTRIC	_____	_____	_____	_____	_____
5. POWDER ACTUATED	_____	_____	_____	_____	_____
6. GASOLINE	_____	_____	_____	_____	_____
7. PNEUMATIC	_____	_____	_____	_____	_____
8. EXCESS AIR FLOW VALVES	_____	_____	_____	_____	_____

G. WELDING AND CUTTING

1. REGULATOR CONDITION	_____	_____	_____	_____	_____
2. FLASHBACK DEVICE	_____	_____	_____	_____	_____
3. CYLINDERS CONDITION	_____	_____	_____	_____	_____
4. CYLINDERS SECURED	_____	_____	_____	_____	_____
5. CYLINDERS STORAGE	_____	_____	_____	_____	_____
6. CYLINDER TRANSPORT	_____	_____	_____	_____	_____
7. WELDING AND CUTTING	_____	_____	_____	_____	_____
8. HOSES	_____	_____	_____	_____	_____
9. TORCHES	_____	_____	_____	_____	_____
10. WELDING LEADS	_____	_____	_____	_____	_____
11. WORK GROUNDED	_____	_____	_____	_____	_____
12. PROTECTIVE SCREENS	_____	_____	_____	_____	_____
13. VENTILATION	_____	_____	_____	_____	_____
14. FIRE PROTECTION	_____	_____	_____	_____	_____
15. WELD/BURN PERMIT	_____	_____	_____	_____	_____

H. ELECTRICAL

1. TAGOUT/LOCKOUT	_____	_____	_____	_____	_____
2. EXTENSION CORDS	_____	_____	_____	_____	_____
3. TEMPORARY POWER	_____	_____	_____	_____	_____
4. TEMPORAERY LIGHTING	_____	_____	_____	_____	_____
5. GROUND-FAULT INTERRUPTER/ ASSURED GROUNDING	_____	_____	_____	_____	_____
6. ISOLATION	_____	_____	_____	_____	_____
7. PLANT OUTLET GROUND	_____	_____	_____	_____	_____
8. POWERLINE CLEARANCE	_____	_____	_____	_____	_____

I. PORTABLE LADDERS

1. PHYSICAL CONDITION	_____	_____	_____	_____	_____
2. PROPER SIZE/PLACEMENT	_____	_____	_____	_____	_____
3. JOB-MADE LADDERS	_____	_____	_____	_____	_____
4. USED SAFELY	_____	_____	_____	_____	_____
5. LADDER FEET/SECURED	_____	_____	_____	_____	_____

J. SCAFFOLDING

	<u>POOR</u>	<u>FAIR</u>	<u>GOOD</u>	<u>EXCEL</u>	<u>SEVERITY POINTS</u>
1. FOOTING	_____	_____	_____	_____	_____
2. ANCHORAGE	_____	_____	_____	_____	_____
3. BRACING	_____	_____	_____	_____	_____
4. GUARD RAILS	_____	_____	_____	_____	_____
5. TOEBOARDS	_____	_____	_____	_____	_____
6. PLANKING	_____	_____	_____	_____	_____
7. SAFE ACCESS	_____	_____	_____	_____	_____
8. GENERAL CONDITION	_____	_____	_____	_____	_____

K. SUSPENSION SCAFFOLDING

1. WIRE ROPES	_____	_____	_____	_____	_____
2. PULLEYS	_____	_____	_____	_____	_____
3. OUTRIGGER BEAMS/ COUNTER WEIGHTS	_____	_____	_____	_____	_____
4. HOISTING MACHINE	_____	_____	_____	_____	_____
5. SECONDARY SUSPENSION FALL PROTECTION	_____	_____	_____	_____	_____

L. CRANE OR DERRICK SUSPENDED WORK PLATFORM

1. PLATFORM DESIGN AND CONSTR.	_____	_____	_____	_____	_____
2. PLATFORM SUPPORT RIGGING	_____	_____	_____	_____	_____
3. PLATFORM LOADING	_____	_____	_____	_____	_____
4. SAFETY BELT AND TIE-OFF	_____	_____	_____	_____	_____

M. FLOOR-WALL-ROOF OPENINGS AND STAIRWAYS

1. GUARD RAIL	_____	_____	_____	_____	_____
2. HOLE COVERS/SECURED	_____	_____	_____	_____	_____
3. HANDRAIL	_____	_____	_____	_____	_____
4. EDGE PROTECTION	_____	_____	_____	_____	_____

N. CRANES, DERRICK, HOISTS, AERIAL LIFTS, ELEVATORS AND CONVEYORS

1. LOAD CAPACITY	_____	_____	_____	_____	_____
2. BOOM ANGLE INDICATOR	_____	_____	_____	_____	_____
3. HAND SIGNALS POSTER	_____	_____	_____	_____	_____
4. WIRE ROPE/MAINTENANCE	_____	_____	_____	_____	_____
5. HOOK AND ATTACHMENTS	_____	_____	_____	_____	_____
6. FIRE EXTINGUISHER	_____	_____	_____	_____	_____
7. SWING RADIUS ISOLATION	_____	_____	_____	_____	_____
8. CAB WINDOW CLEAN	_____	_____	_____	_____	_____

O. MOTOR VEHICLES

	<u>POOR</u>	<u>FAIR</u>	<u>GOOD</u>	<u>EXCEL</u>	<u>SEVERITY POINTS</u>
1. BRAKE SYSTEM	_____	_____	_____	_____	_____
2. BRAKE LIGHTS	_____	_____	_____	_____	_____
3. HORN	_____	_____	_____	_____	_____
4. BACK-UP WARNING	_____	_____	_____	_____	_____
5. SECURED SEATS FOR TRANSPORTING EMPLOYEES	_____	_____	_____	_____	_____
6. FIRE EXTINGUISHER	_____	_____	_____	_____	_____
7. SAFE OPERATION	_____	_____	_____	_____	_____
8. SEAT BELTS	_____	_____	_____	_____	_____
9. WINDSHIELDS-WINDOWS	_____	_____	_____	_____	_____

P. EXCAVATION, TRENCHING AND SHORING

1. ANGLE OF REPOSE AND SLOPEING	_____	_____	_____	_____	_____
2. SPOIL & MATERIAL STORAGE	_____	_____	_____	_____	_____
3. SUPPORT SYSTEM/SHORING	_____	_____	_____	_____	_____
4. PROVISIONS FOR EXIT	_____	_____	_____	_____	_____
5. DIGGING PERMIT	_____	_____	_____	_____	_____
6. BARRICADE/ISOLATE AREA	_____	_____	_____	_____	_____

Q. CONCRETE, CONCRETE FORMS AND SHORING

1. FORM SUPPORT	_____	_____	_____	_____	_____
2. STRIPPED FORMS	_____	_____	_____	_____	_____
3. WORK PLATFORMS/ACCESS	_____	_____	_____	_____	_____
4. FALL ON RE-BAR PROTECTION	_____	_____	_____	_____	_____

R. STEEL ERECTION

1. FLOORING-PLANKING	_____	_____	_____	_____	_____
2. TOOLS/MATERIALS SECURED	_____	_____	_____	_____	_____
3. FALL PROTECTION	_____	_____	_____	_____	_____
4. SAFE DIST. FROM PWR. LINE	_____	_____	_____	_____	_____
5. TAG LINE	_____	_____	_____	_____	_____

S. HOUSEKEEPING

1. AISLES/WALKWAYS	_____	_____	_____	_____	_____
2. WORK AREAS	_____	_____	_____	_____	_____
3. SCRAP AND TRASH REMOVAL	_____	_____	_____	_____	_____
4. MATERIAL/EQUIPMENT STORAGE	_____	_____	_____	_____	_____
5. NAILS CLINCHED OR REMOVED	_____	_____	_____	_____	_____

	<u>POOR</u>	<u>FAIR</u>	<u>GOOD</u>	<u>EXCEL</u>	<u>SEVERITY POINTS</u>
1. INJURY ILLNESS REPORTING					
2. ASSURED GROUNDING					
3. CRANES, DERRICKS, ETC.					
4. MOTOR VEHICLES					
5. SAFTY TRAINING					

1.	ATTITUDE (SUPERVISORS)	_____	_____	_____	_____	_____
2.	SAFTY AWARENESS (SUPERS)	_____	_____	_____	_____	_____
3.	EMPLOYEES SAFETY PERF.	_____	_____	_____	_____	_____
4.	CORRECTIVE ACTIONS TAKEN	_____	_____	_____	_____	_____
	CONCERNING VIOLATIONS	_____	_____	_____	_____	_____
5.	SAFETY ED AND TRAINING	_____	_____	_____	_____	_____
6.	SUBCONTRACTOR	_____	_____	_____	_____	_____
	PERFORMANCE	_____	_____	_____	_____	_____

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

SCORING GUIDE TO FEDERAL, STATE, LOCAL AND SAFETY STANDARDS.
POOR-GENERALLY OUT OF COMPLIANCE; GOOD RARELY OUT OF COMPLIANCE;
EXCELLENT-ALWAYS IN COMPLIANCE; N/A NOT APPLICABLE AT THIS TIME.

APPENDIX F

HASP ACKNOWLEDGEMENT FORM AND
LIABILITY RELEASE FORM

SITE SAFETY PLAN REVIEW AND DOCUMENTATION

I have been briefed on and understand my responsibilities under this HASP. I have been informed of the personnel to contact if I have any questions and know where to report any additional health and safety hazards. I agree to work to the safety plan guidelines and understand that failure to do so could result in removal from the site and/or termination.

[illegible]

LIABILITY RELEASE FORM

Pelham Bay Landfill

Each visitor to the Site will be required to execute this release holding the New York City Department of Environmental Protection (NYCDEP) and its contractors harmless for personal or other injuries and/or damage which may occur during the course of the site visit. Visitors will not be granted access to the Site unless this release is executed. Each person should **complete this form prior** to the site visit and bring it with them to the Site. Any visitor who **fails to sign this** release form will not be allowed on the Site. Submission of **this form** will serve as a release of liability and as proof of a site visit. The undersigned acknowledges the following.

The NYCDEP advises all site visitors that it is without complete knowledge of the content and nature of the substances onsite, or in the soil and air onsite; and that is without knowledge of the nature or degree of the hazards which might arise therefrom. The NYCDEP further advises that it has given the site a D hazard rating pursuant to applicable federal standards for the purpose of this inspection. Any person or persons who enter upon the Site, examine the Site, or conduct any activity on or in the vicinity of the Site do so at their own risk. The NYCDEP assumes no liability whatsoever for any damage, loss or injury of any kind arising in anyway from such entry upon, examination of or activity on or in the vicinity of Site by any persons.

The visitor agrees that, if given permission to enter upon and examine the Site, said visitor shall be solely responsible for and shall keep, save, and hold harmless the NYCDEP, its employees and contractors from and against any and all claims, demands, suits, actions, recoveries, judgments, costs and expenses in connection therewith on account of loss of life, property, or injury damage to the person, body or property of any person, agency or corporation, which shall arise from or result directly or indirectly from said entry upon, inspection of, or activity upon or in the vicinity of the site.

LIABILITY RELEASE FORM

Pelham Bay Landfill

(Continued)

Address of Firm

Representative's Name

Signature will certify both understanding and acceptance of the liability release.

Signature _____

Date _____

APPENDIX A

MONITORING WELL/PIEZOMETER CONSTRUCTION LOGS

Attached

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER MW-113

Project name & location PELHAM BAY LANDFILL, BRONX, NEW YORK	Well lock No. 3220	Elevation datum Bronx Datum (BD) 2.068 ft. above MSL
Drilling company WARREN-GEORGE INC.	Surveyor ETTLINGER & ETLINGER	Ground elevation 8.22 ft
Date and time of completion 5/26/92	Northing 29070.315	Top of protective steel casing elevation 11.42 ft
Inspector D. Davidson	Easting -19814.674	Top of riser pipe elevation 11.07 ft

	ELEV.	DEPTH	
	(ft above/ below BD)	(ft below / above ground)	
A = Top of Riser	11.07	A	2.85
B = Ground Surface			
C = Top of Bentonite Seal			
D = Top of Sand Pack			
E = Top of Screen			
F = Bottom of Screen			
G = Bottom of PVC/Steel			
H = Bottom of Borehole			

**GENERALIZED
SOIL DESCRIPTION**

0-10 inches: Brown organic soil.
11"- 13ft.: Sand, silt, gravel, and decomposed rock.

13-14 ft.: Dk-med. grey SILT.

14-18 ft.: Decomposed ROCK.

18-22 ft.: Fine biotite GNEISS with garnet.

22-23 ft.: Coarse grained PEGMATITE DIKE.

23-28 ft.: White and black biotite-feldspar GNEISS with garnet, quartz.

8.22 B 0

6.72 C 1.5

5.72 D 2.5

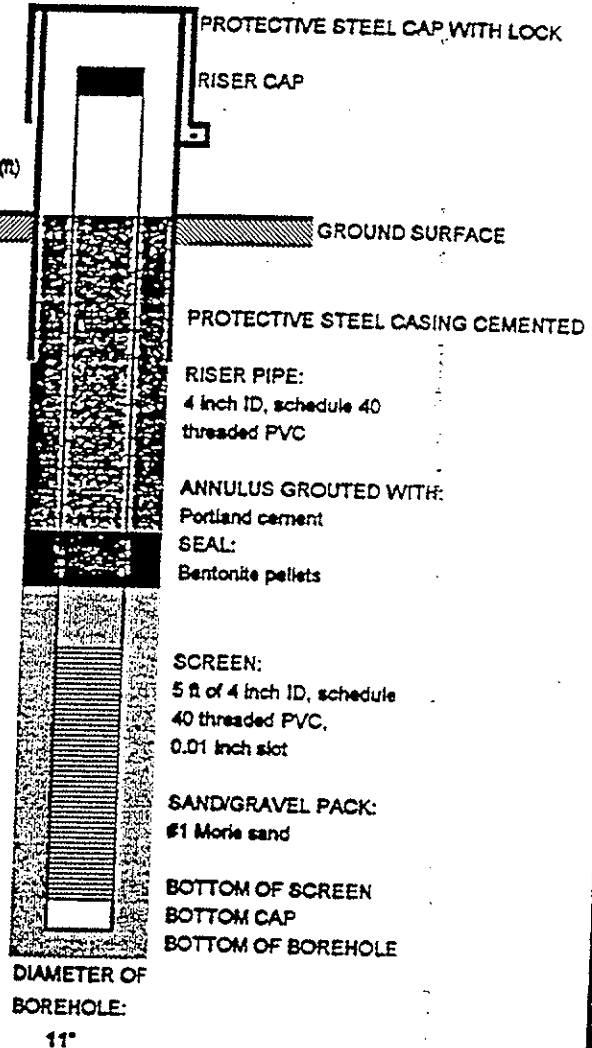
3.72 E 4.5

-1.28 F 9.5

-1.28 G 9.5

-19.78 H 28

STICKUP (ft)
3.2



REMARKS (Installation, development):

MATERIALS: 10 FT. OF 4" SCH 40 PVC RISER, 5 FT. OF SCH 40 PVC SCREEN, 2 BOTTOM/TOP CAPS, 4 BAGS #1 SAND, 1 BUCKET OF BENTONITE PELLETS, 2 BAGS OF PORTLAND CEMENT, 1 4" STICK UP.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER MW-114

Project name & location	Well lock No.	Elevation datum
PELHAM BAY LANDFILL, BRONX, NEW YORK	3220	Bronx Datum (BD) 2.608 ft. above MSL
Drilling company	Surveyor	Ground elevation
WARREN-GEORGE	ETTLINGER & ETTLINGER	7.96 ft
Date and time of completion	Neighboring	Top of protective steel casing elevation
5/27/82	28402.734	8.26 ft
Inspector	Easting	Top of riser pipe elevation
O. Davidson	-20517.831	8.01 ft

A = Ground Surface	ELEV.	DEPTHS
B = Top of Riser	(ft above/	(ft below/
C = Top of Bentonite Seal	below BD)	above ground)
D = Top of Sand Pack		
E = Top of Screen		
F = Bottom of Screen		
G = Bottom of PVC/Steel		
H = Bottom of Borehole		

GENERALIZED	7.96	A	0
SOIL DESCRIPTION	8.01	E	0.05

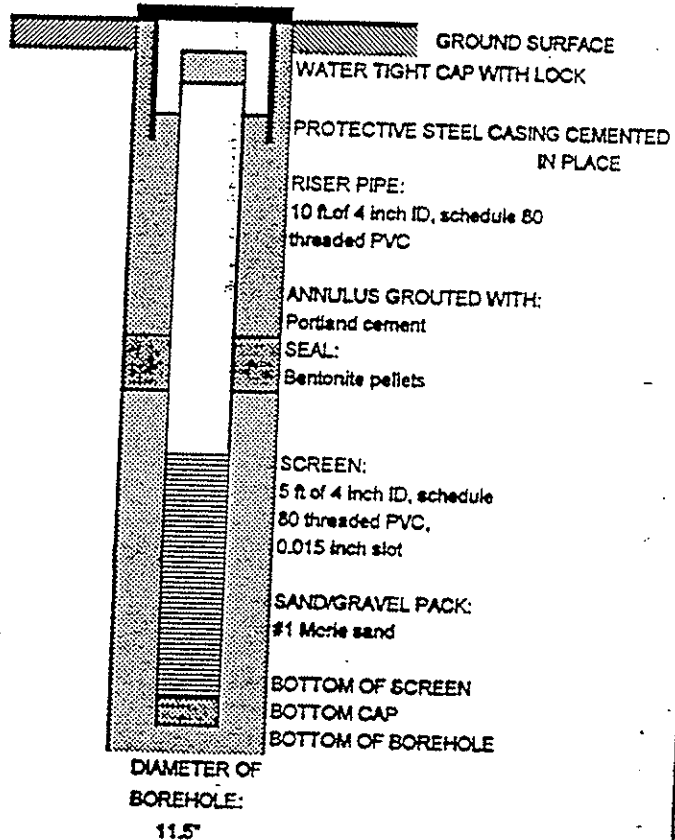
0-8 ft.: Dk. brown gravelly sandy organic soil.

8.01	C	0.05
7.14	D	0.82

8-12 ft.: Orange-brown and green-brown micaceous varved SILT.

12-22 ft.: Brown to olive green fine-coarse silty SAND w/ gravel, decomposed micaceous rock. Very green color at 18 ft. (chlorite?)	-3.86	F	11.82
	-3.86	G	11.82
Varved mica, silt stringers at 20 ft.	-5.54	H	13.5

FLUSHMOUNT (ft)
0.3



REMARKS (Installation, development):

MATERIALS: 5 FT. OF 4" SCH 80 PVC SCREEN, 10 FT OF 4" SCH 80 PVC RISER, 1 BOTTOM CAP, 3 BAGS OF #1 SAND, 1 BUCKET OF BENTONITE PELLETS, 1 BAG OF PORTLAND CEMENT, 1 FLUSH MOUNT CASING.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER MW-115

Project name & location	Well lock No.	Elevation datum
PELHAM BAY LANDFILL, BRONX, NEW YORK	3220	Bronx Datum (BD) 2.608 ft above MSL
Drilling company	Surveyor	Ground elevation
WARREN-GEORGE INC.	ETTLINGER & ETLINGER	18.44 ft
Date and time of completion	Northing	Top of protective steel casing elevation
6/8/92	27911.455	21.64 ft
Inspector	Easting	Top of riser pipe elevation
B. Atkinson	-20754.435	20.34 ft

- A = Top of Riser
- B = Ground Surface
- C = Top of Bentonite Seal
- D = Top of Sand Pack
- E = Top of Screen
- F = Bottom of Screen
- G = Bottom of PVC/Steel
- H = Bottom of Borehole

ELEV.		DEPTHS
(ft above/ below BD)		(ft below/ above ground)
20.34	A	1.9

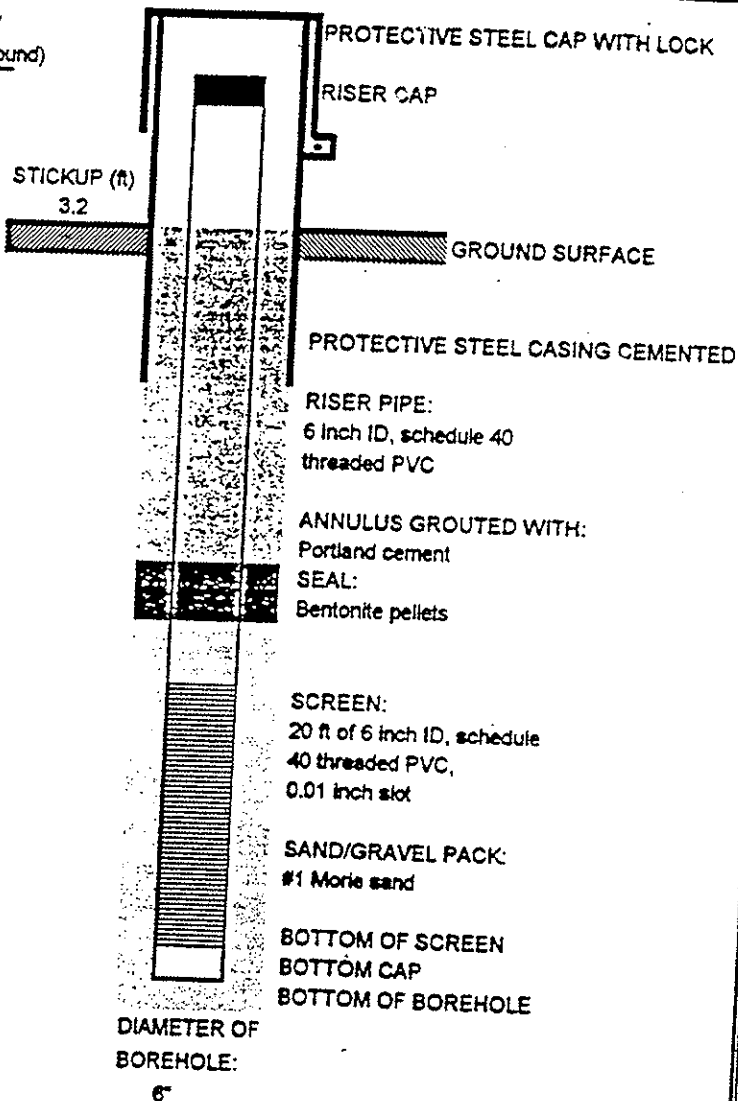
**GENERALIZED
SOIL DESCRIPTION**

0-6 ft.: Lt. brown cuttings.

6-16 ft.: Black cuttings.

16-41 ft.: Lt. brown-brown
fine SAND w/ mica and
gravel.

18.44	B	0
9.44	C	9
1.44	D	17
-2.56	E	21
-22.56	F	41
-22.56	G	41
-22.56	H	41



REMARKS (Installation, development) :

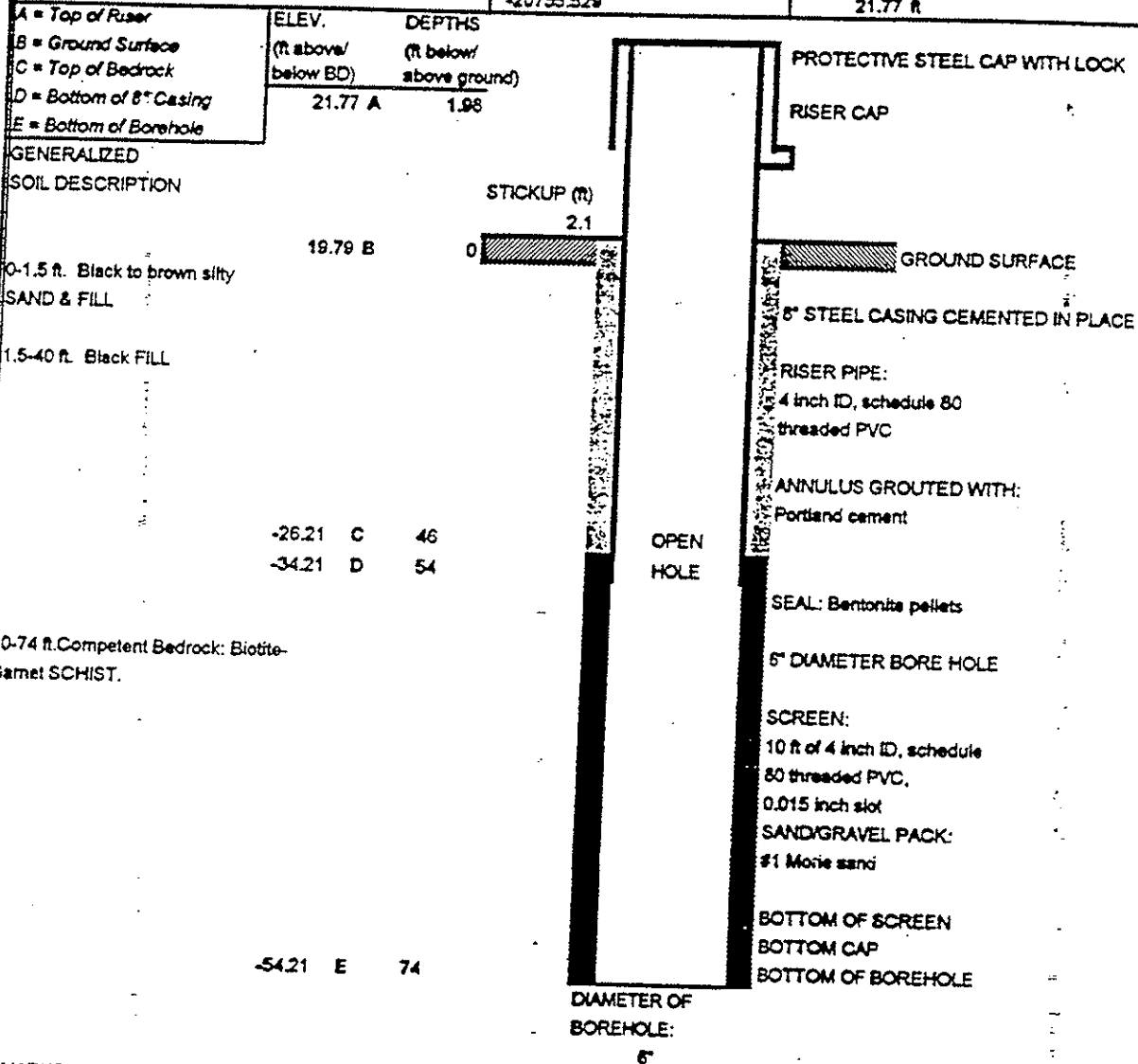
MATERIALS: 22 ft. OF 6" SCH 40 PVC RISER, 20 FT. OF 6" SCH 40 WIRE WRAPPED PVC SCREEN,
8 BAGS OF #1 SAND, 1 1/2 BUCKETS OF BENTONITE PELLETS, 4 BAGS OF CEMENT.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER

MW-115B

Project name & location PELHAM BAY LANDFILL, BRONX, NEW YORK	Well lock No. S220	Elevation datum Bronx Datum (BD) 2.608 ft. above MSL
Drilling company WARREN-GEORGE, INC.	Surveyor ETTLINGER & ETTLINGER	Ground elevation 19.79 ft
Date and time of completion 6/8/92	Northing 27904.201	Top of protective steel casing elevation 21.89 ft
Inspector B. Abelson	Easting -20755.529	Top of riser pipe elevation 21.77 ft



REMARKS (Installation, development):

Open bedrock hole 54 - 74 feet.

MATERIALS: 10 FT OF 4" SCH 80 PVC SCREEN, 104 FT OF SCH 80 PVC RISER,

21 FT OF 8" STEEL CASING, 1 BOTTOM CAP, 6 BAGS OF #1 SAND, 1 BUCKET OF BENTONITE PELLETS, 10 BAGS OF PORTLAND CEMENT, 1 6" STICK UP CASING.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER MW-117

Project name & location	Well lock No.	Elevation datum
PELHAM BAY LANDFILL, BRONX, NEW YORK	3220	Bronx Datum (BD) 2.608 ft above MSL
Drilling company	Surveyor	Ground elevation
WARREN-GEORGE, INC.	ETTLINGER & ETTINGER	5.18 ft
Date and time of completion	Northing	Top of protective steel casing elevation
6/1/92	26539.141	7.49 ft
Inspector	Easting	Top of riser pipe elevation
D. Davidson	-20177.984	7.33 ft

- A = Top of Riser
- B = Ground Surface
- C = Top of Bentonite Seal
- D = Top of Sand Pack
- E = Top of Screen
- F = Bottom of Screen
- G = Bottom of PVC/Steel
- H = Bottom of Borehole

ELEV.	DEPTHS
(ft above/ below BD)	(ft below/ above ground)
7.33 A	2.15

**GENERALIZED
SOIL DESCRIPTION**

0-2 ft.: Highly organic sandy, silty soil.

2-9 ft.: Crushed SLAG

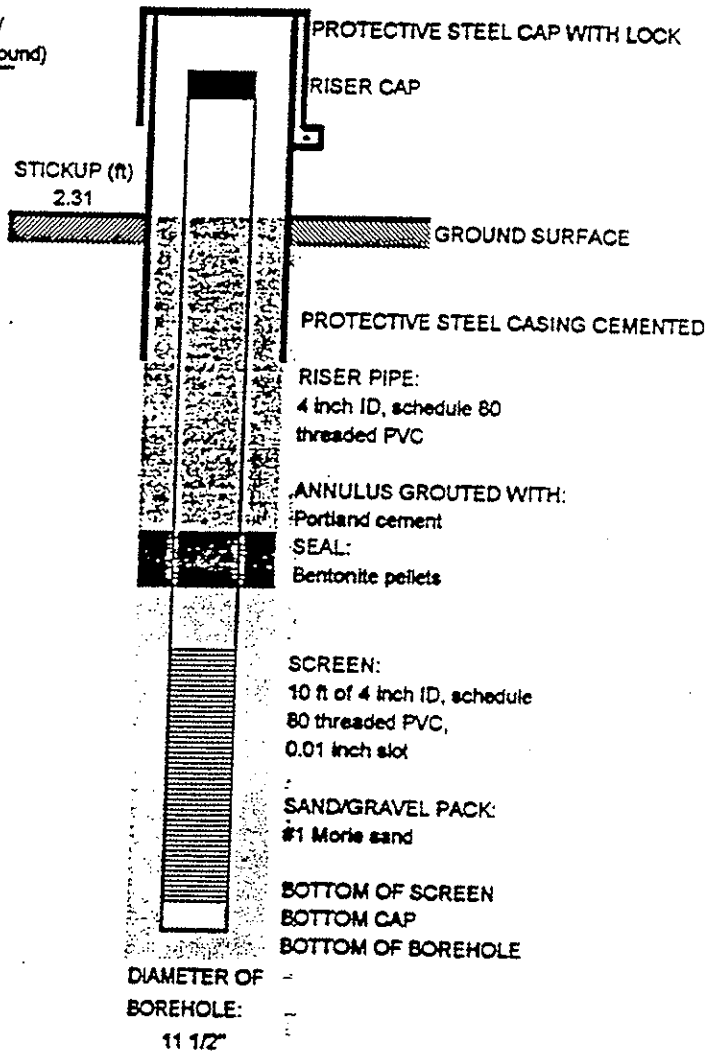
1.18 C	4
-0.82 D	6
-2.82 E	8

9-11 ft.: Lt. gray highly organic SILT.

11-18 ft.: Decomposed ROCK w/ silt and sand.

18-28 ft. NX core: Competent bedrock
Biotite-feldspar GNEISS
w/ quartz and garnet.

-12.82 F	18
-12.82 G	18
-12.82 H	18



REMARKS (Installation, development) :

MATERIALS: 10 FT OF 4" SCH 80 PVC SCREEN, 10 FT OF 4" SCH 80 PVC RISER, 1 BOTTOM CAP, 2 BAGS OF #1 SAND, 1 BUCKET OF BENTONITE PELLETS, 2 BAGS OF PORTLAND CEMENT, 1 6" STICK UP CASING.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER

MW-117B

Project name & location PELHAM BAY LANDFILL, BRONX, NEW YORK	Well lock No. 3220	Elevation datum Bronx Datum (BD) 2.608 ft. above MSL
Drilling company WARREN-GEORGE, INC.	Surveyor ETTLINGER & ETLINGER	Ground elevation 4.62 ft
Date and time of completion 6/29/92	Northing 26615.782	Top of protective steel casing elevation 6.52 ft
Inspector R. Costa	Easting -20186.704	Top of riser pipe elevation 6.40 ft

A = Top of Riser
B = Ground Surface
C = Top of Bedrock
D = Bottom of 8" Casing
E = Top of Bentonite Seal
F = Top of Sand Pack
G = Top of Screen
H = Bottom of Screen
I = Bottom of PVC/Steel
J = Bottom of Borehole

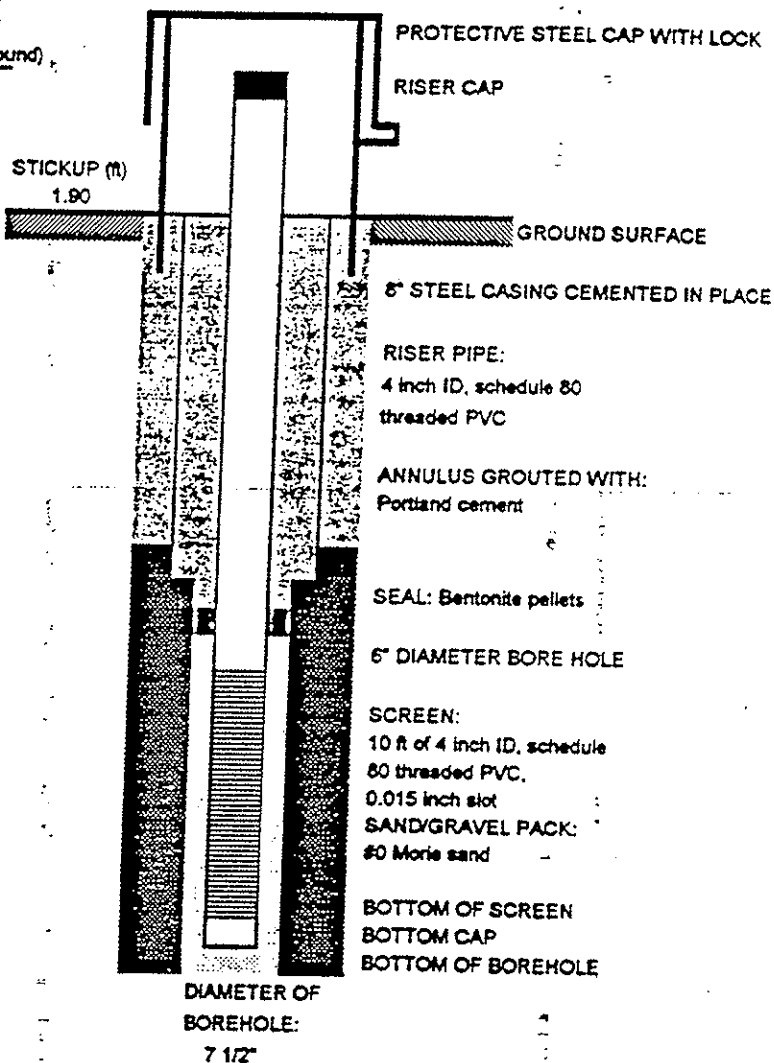
**GENERALIZED
SOIL DESCRIPTION**

0-16 ft.: Brown med. SAND
and SILT.

16-24.5 ft.: Decomposed
biotite SCHIST.

24.5-78 ft.: Competent
Bedrock:
Biotite-garnet SCHIST.

ELEV. (ft above MSL)	DEPTHS (ft below/ above ground)
6.40 A	1.78
4.62 B	0
-19.88 C	24.5
-21.38 D	26
-25.38 E	30
-27.38 F	32
-63.38 G	68
-73.38 H	78
-73.38 I	78
-73.38 J	78



REMARKS (Installation, development) :

MATERIALS: 28 FT OF 8" STEEL CASING; 1 BOTTOM PLUG; 10 FT OF SCH 80 4" PVC

SCREEN 0.015 SLOT; 70 FT OF 4" SCH 80 PVC RISER; 6 BAGS #10 MORIE SAND; 1/2 BUCKET BENTONITE PELLETS, 4 BAGS PORTLAND CEMENT; 1 STANDPIPE W/ LOCK.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER MW-118

Project name & location PELHAM BAY LANDFILL, BRONX, NEW YORK	Well log No. 3220	Elevation datum Bronx Datum (BD) 2.608 ft. above MSL
Drilling company WARREN-GEORGE, INC.	Surveyor ETTLINGER & ETTLINGER	Ground elevation 10.83 ft
Date and time of completion 6/3/92	Northing 26728.412	Top of protective steel casing elevation 13.73 ft
Inspector D. Davidson	Easting -19287.747	Top of riser pipe elevation 13.19 ft

- A = Top of Riser
- B = Ground Surface
- C = Top of Bentonite Seal
- D = Top of Sand Pack
- E = Top of Screen
- F = Bottom of Screen
- G = Bottom of PVC/Steel
- H = Bottom of Borehole

ELEV.		DEPTHS
(ft above/ below BD)		(ft below/ above ground)

13.19 A 2.36

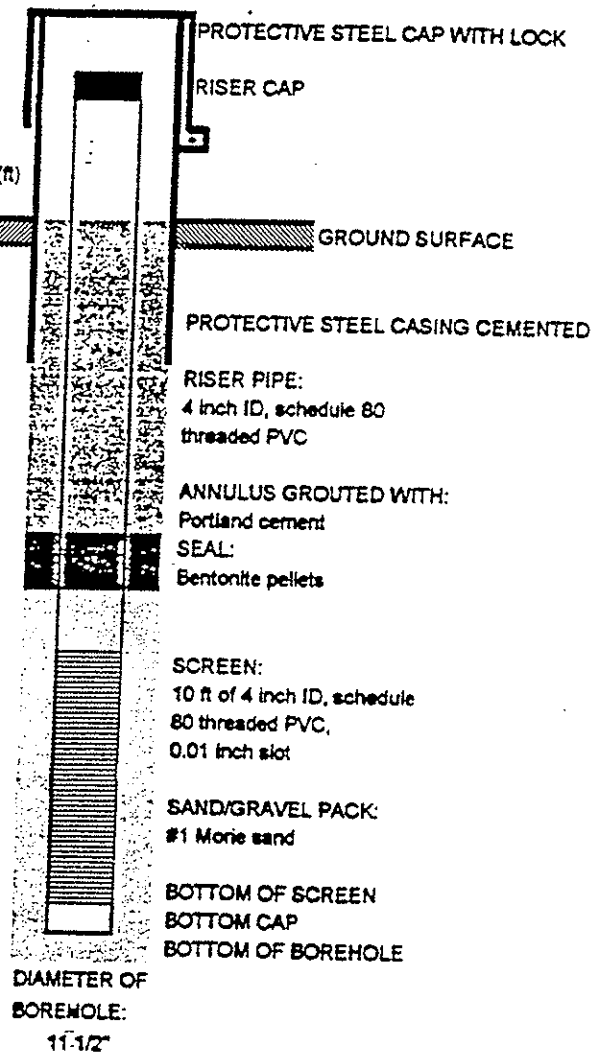
10.83 B 0

8.83 C 2
7.33 D 3.5

5.83 E 5

-4.17 F 15
-4.17 G 15
-4.71 H 15

STICKUP (ft)
2.9



0-6 ft.: Sand, silt, gravel, and decomposed rock.

6-15 ft.: FILL

REMARKS (Installation, development):

MATERIALS: 10 FT OF 4" SCH 80 PVC SCREEN, 10 FT OF 4" SCH 80 PVC RISER, 1 BOTTOM CAP, 6 BAGS OF #1 SAND, 1 BUCKET OF BENTONITE PELLETS, 3 BAGS OF PORTLAND CEMENT, 1 6" STICK UP CASING.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER MW-119

Project name & location	Well lock No.	Elevation datum
PELHAM BAY LANDFILL, BRONX, NEW YORK	3220	Bronx Datum (BD) 2.608 ft. above MSL
Drilling company	Surveyor	Ground elevation
WARREN-GEORGE INC.	ETTLINGER & ETLINGER	11.52 ft
Date and time of completion	Northing	Top of protective steel casing elevation
6/10/92	27200.06	13.92 ft
Inspector	Easting	Top of riser pipe elevation
D. Davidson	-18950.844	13.78 ft

	ELEV.		DEPTHS
	(ft above/ below BD)		(ft below/ above ground)
A = Top of Riser	13.78	A	2.26
B = Ground Surface			
C = Top of Bentonite Seal			
D = Top of Sand Pack			
E = Top of Screen			
F = Bottom of Screen			
G = Bottom of PVC/Steel			
H = Bottom of Borehole			

**GENERALIZED
SOIL DESCRIPTION**

0-27 ft.: FILL.

11.52 B 0

-0.48 C 12

-2.48 D 14

-6.48 E 18

27-52 ft.: RIP-RAP

52-58.5 ft.: White and black
biotite feldspar GNEISS
w/ muscovite, quartz, and
garnet.

-16.48 F 28

-16.48 G 28

-40.48 H 52

STICKUP (ft)
2.4

PROTECTIVE STEEL CAP WITH LOCK

RISER CAP

GROUND SURFACE

PROTECTIVE STEEL CASING CEMENTED

RISER PIPE:
4 inch ID, schedule 80
threaded PVC

ANNULUS GROUTED WITH:
Portland cement
SEAL:
Bentonite pellets

SCREEN:
10 ft of 4 inch ID, schedule
80 threaded PVC,
0.015 inch slot

SAND/GRAVEL PACK:
#1 Morie sand

BOTTOM OF SCREEN
BOTTOM CAP
BOTTOM OF BOREHOLE

DIAMETER OF
BOREHOLE:

11"

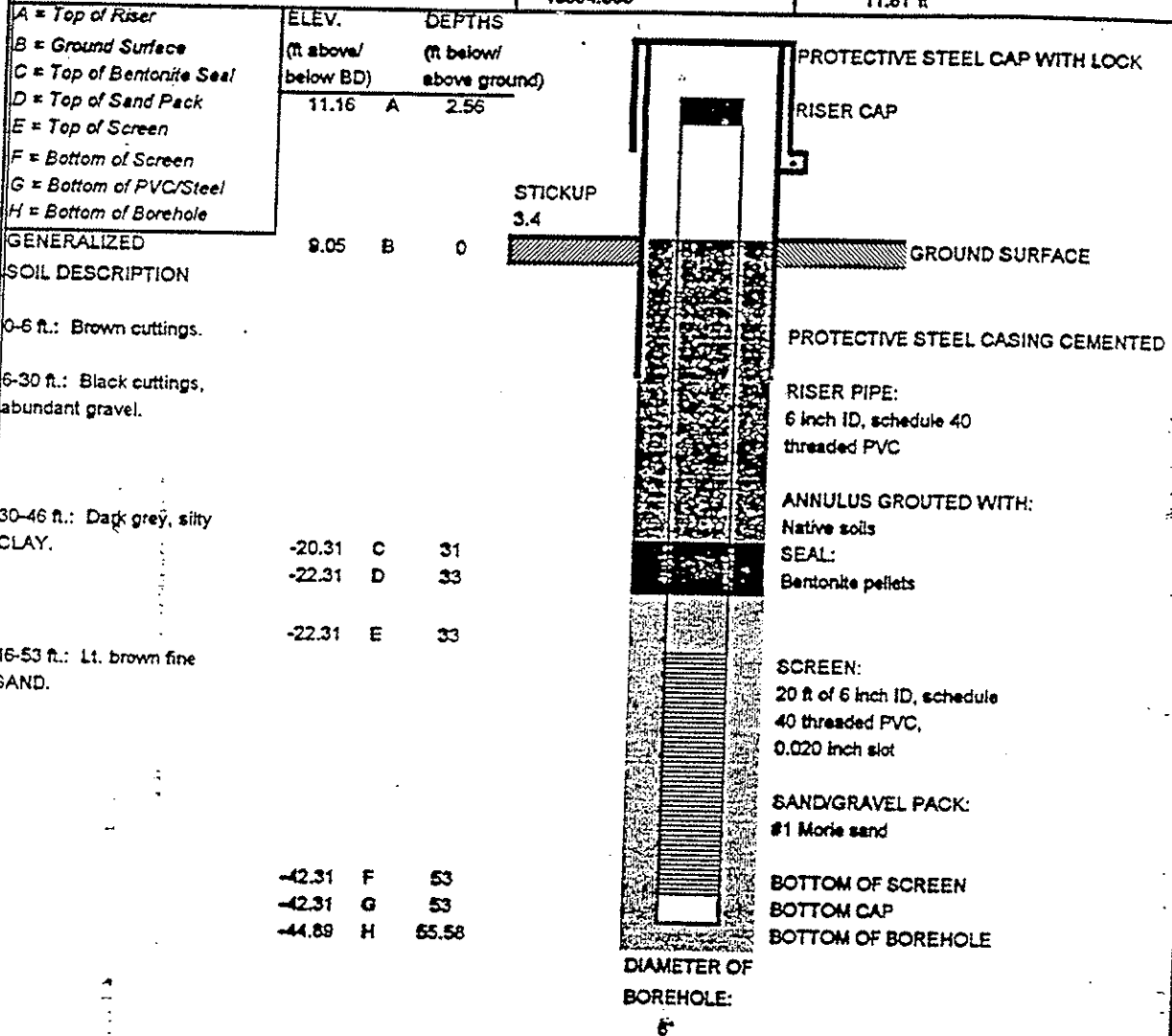
REMARKS (Installation, development):

MATERIALS: 10 FT OF 4" SCH 80 PVC SCREEN, 20 FT OF 4" SCH 80 PVC RISER, 1 BOTTOM CAP, 4 BAGS OF #1 SAND, 1 BUCKET OF BENTONITE PELLETS, 3 BAGS OF PORTLAND CEMENT, 1 6" STICK UP CASING.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER MW-120

Project name & location PELHAM BAY LANDFILL, BRONX, NEW YORK	Well lock No. 3220	Elevation datum Bronx Datum (BD) 2.603 ft. above MSL.
Drilling company WARREN-GEORGE, INC.	Surveyor ETTLINGER & ETTLINGER	Ground elevation 9.05 ft
Date and time of completion 6/10/92	Northing 27776.950	Top of protective steel casing elevation 12.45 ft
Inspector B. Atkinson	Easting -18994.003	Top of riser pipe elevation 11.61 ft



REMARKS (Installation, development):

MATERIALS: 20 FT OF 6" SCH 40 PVC SCREEN, 36 FT OF 6" SCH 40 PVC RISER, 1 BOTTOM CAP, 9 BAGS OF #1 SAND, 1 BUCKET OF BENTONITE PELLETS.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER

MW-120B

Project name & location PELHAM BAY LANDFILL, BRONX, NEW YORK	Well lock No. 3220	Elevation datum Bronx Datum (BD) 2.608 ft. above MSL
Drilling company WARREN-GEORGE, INC.	Surveyor ETTLINGER & ETTLINGER	Ground elevation 9.09 ±
Date and time of completion 5/22/92	Northing 27791.700	Top of protective steel casing elevation 10.99 ±
Inspector J. Prunetti	Easting -18995.120	Top of riser pipe elevation 10.84 ft

- A = Top of Riser
- B = Ground Surface
- C = Top of Bedrock
- D = Bottom of 8" Casing
- E = Top of Bentonite Seal
- F = Top of Sand Pack
- G = Top of Screen
- H = Bottom of Screen
- I = Bottom of PVC/Steel
- J = Bottom of Borehole

ELEV.		DEPTHS
(ft above/ below BD)		(ft below/ above ground)
10.84	A	1.75
9.09	B	0
-46.95	C	56
-54.95	D	64
-55.95	E	65
-57.95	F	67
-59.95	G	69
-69.95	H	79
-69.95	I	79
-69.95	J	79

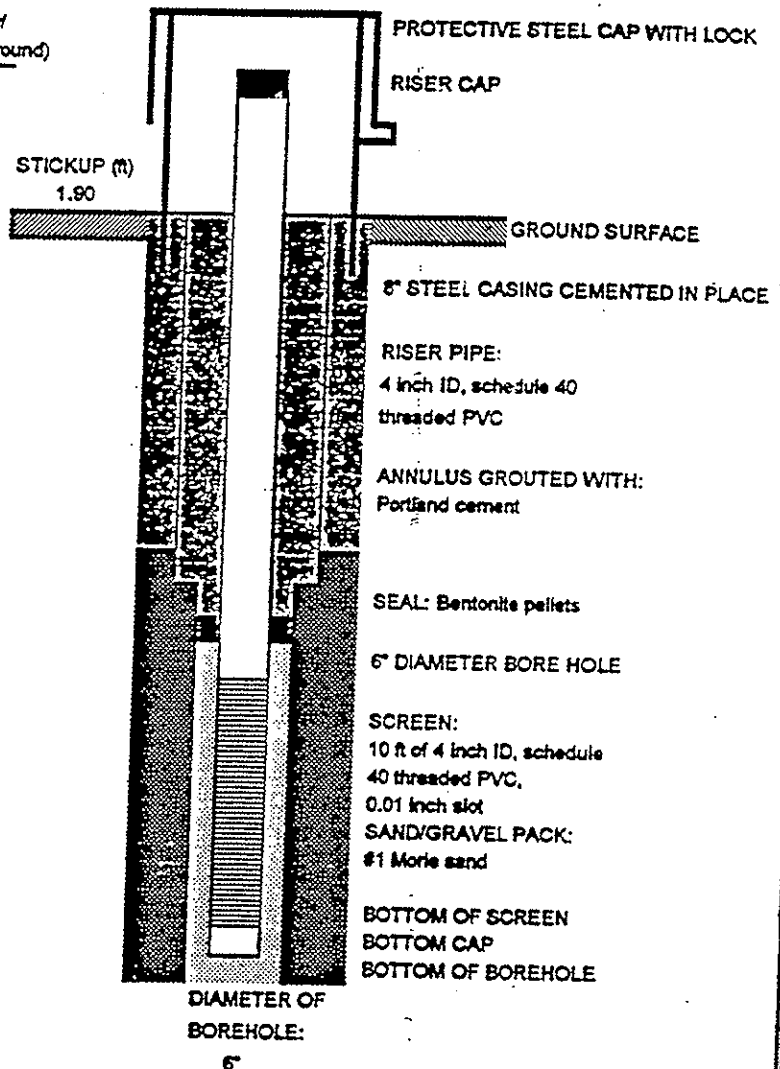
**GENERALIZED
SOIL DESCRIPTION**

0-45 ft.: Dark grey cuttings
and fluids; unconsolidated material.
(FILL?)

45-56 ft.: Tan cuttings, very
soft material. (Glacial
Sediment?)

56-79 ft.: Lt. grey cuttings;
BEDROCK.

-46.95	C	56
-54.95	D	64
-55.95	E	65
-57.95	F	67
-59.95	G	69
-69.95	H	79
-69.95	I	79
-69.95	J	79



REMARKS (Installation, development):

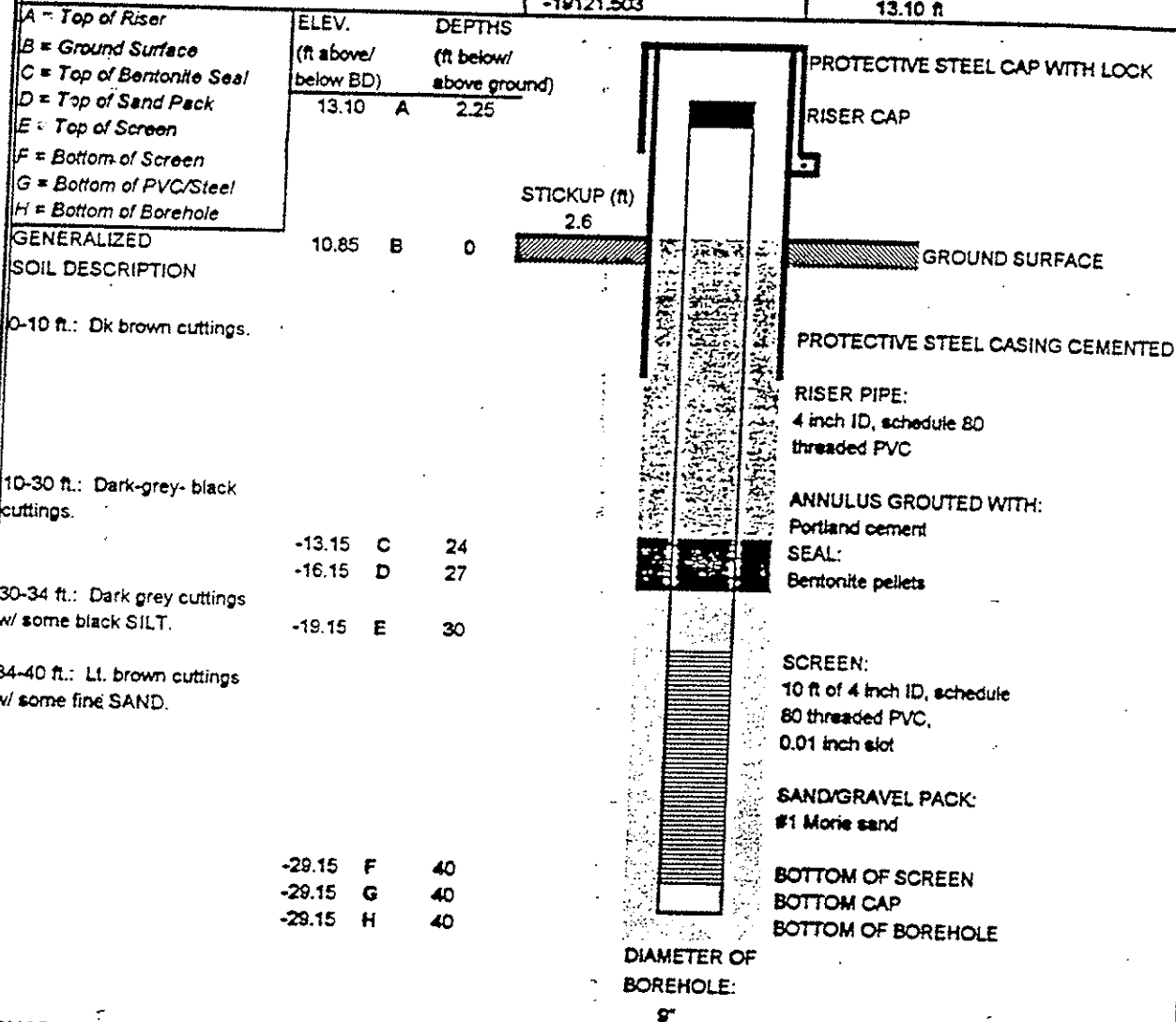
8" casing driven to 64 ft.; borehole advanced to 79 ft. to set well.

MATERIALS: 10 FT 4" SCH 40 PVC SCREEN; 70 FT 4" SCH 40 PVC RISER; 65 FT 8" STEEL CASING; 3 BAGS #1 MORIE SAND; 11 BAGS PORTLAND CEMENT; 1 BUCKET BENTONITE PELLETS; 1 BOTTOM CAP; 1 STANDPIPE W/ LOCK.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER MW-121

Project name & location PELHAM BAY LANDFILL, BRONX, NEW YORK	Well lock No. 3220	Elevation datum Bronx Datum (BD) 2.608 ft. above MSL.
Drilling company WARREN-GEORGE INC.	Surveyor ETTLINGER & ETTLINGER	Ground elevation 10.85 ft
Date and time of completion 5/29/82	Northing 28578.134	Top of protective steel casing elevation 13.45 ft
Inspector B. Atkinson	Easting -19121.503	Top of riser pipe elevation 13.10 ft



REMARKS (Installation, development):

MATERIALS: 32 ft. OF 4" SCH 80 PVC RISER, 10 FT. OF 4" SCH 80 PVC SCREEN, 1 BUCKET OF BENTONITE PELLETS, FIVE BAGS OF # 1 SAND, 4 BAGS OF PORTLAND CEMENT

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER MW-122

Project name & location PELHAM BAY LANDFILL, BRONX, NEW YORK	Well lock No. 3220	Elevation datum Bronx Datum (BD) 2.608 ft. above MSL.
Drilling company WARREN-GEORGE INC.	Surveyor ETTLINGER & ETTLINGER	Ground elevation 9.54 ft
Date and time of completion 6/2/92	Northing 28967.069	Top of protective steel casing elevation 12.04 ft
Inspector B. Atkinson	Easting -18311.343	Top of riser pipe elevation 11.68 ft

- A = Top of Riser
- B = Ground Surface
- C = Top of Bentonite Seal
- D = Top of Sand Pack
- E = Top of Screen
- F = Bottom of Screen
- G = Bottom of PVC/Steel
- H = Bottom of Borehole

**GENERALIZED
SOIL DESCRIPTION**

0-26 ft.: Brownish-dk. grey
gravelly cuttings.

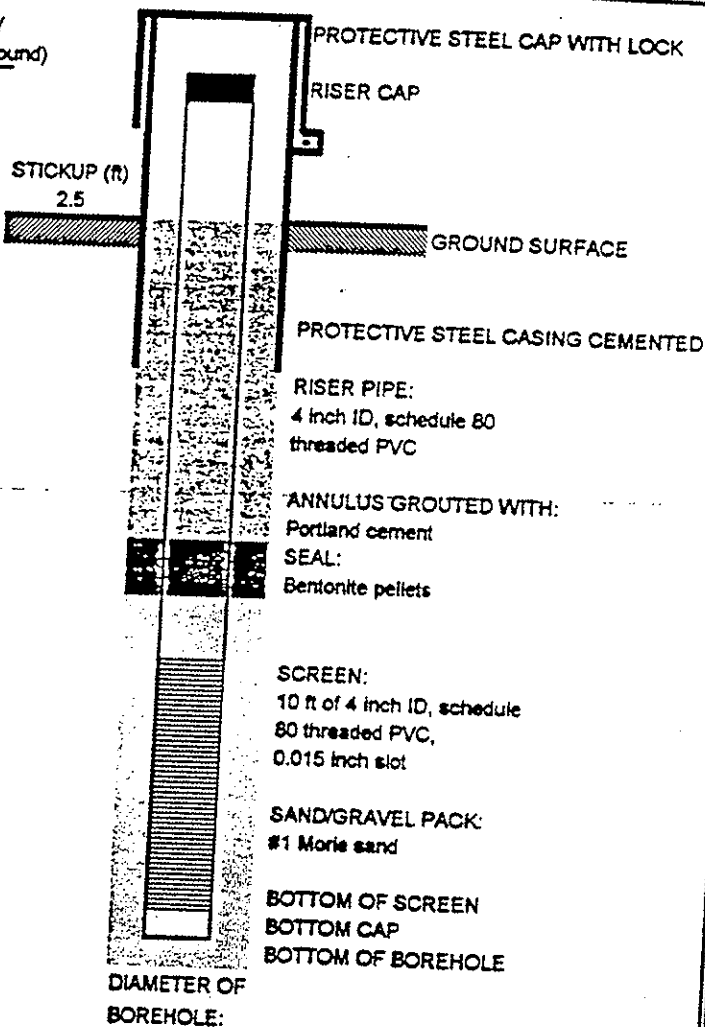
26-28 ft.: Dk. grey-black
SILT.

28-37 ft.: Lt. brown fine
SAND.

ELEV. (ft. above/ below BD)	DEPTHS (ft. below/ above ground)
11.68 A	2.14

9.54 B	0
-11.46 C	21
-14.46 D	24
-17.46 E	27

-27.46 F	37
-27.46 G	37
-27.46 H	37



REMARKS (Installation, development):

30 FT. OF SCH 80 4" PVC RISER, 10 FT. OF SCH 80 4" PVC SCREEN, 1 BUCKET OF BENTONITE PELLETS, 5 BAGS OF #1 SAND, 4 BAGS OF PORTLAND CEMENT, 2 SCH 80 PVC BOTTOM/TOP CAPS.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER MW-124

Project name & location	Well lock No.	Elevation datum
PELHAM BAY LANDFILL, BRONX, NEW YORK	3220	Bronx Datum (BD) 2.608 ft. above MSL.
Drilling company	Surveyor	Ground elevation
WARREN-GEORGE, INC.	ETTLINGER & ETLINGER	22.14 ft
Date and time of completion	Northing	Top of protective steel casing elevation
7/2/82	26498.996	22.24 ft
Inspector	Easting	Top of riser pipe elevation
M. McGill	-20818.821	22.12 ft

- A = Ground Surface
- B = Top of Riser
- C = Top of Bentonite Seal
- D = Top of Sand Pack
- E = Top of Screen
- F = Bottom of Screen
- G = Bottom of PVC/Steel
- H = Bottom of Borehole

ELEV.	DEPTHS
(ft above/ below BD)	(ft below/ above ground)

GENERALIZED
SOIL DESCRIPTION

0-5 ft.: Brown SAND and
SILT.

5-7 ft.: Tan fine-coarse dense
SAND, some coarse-fine gravel,
dry.

7-14 ft.: Brown SAND and
GRAVEL.

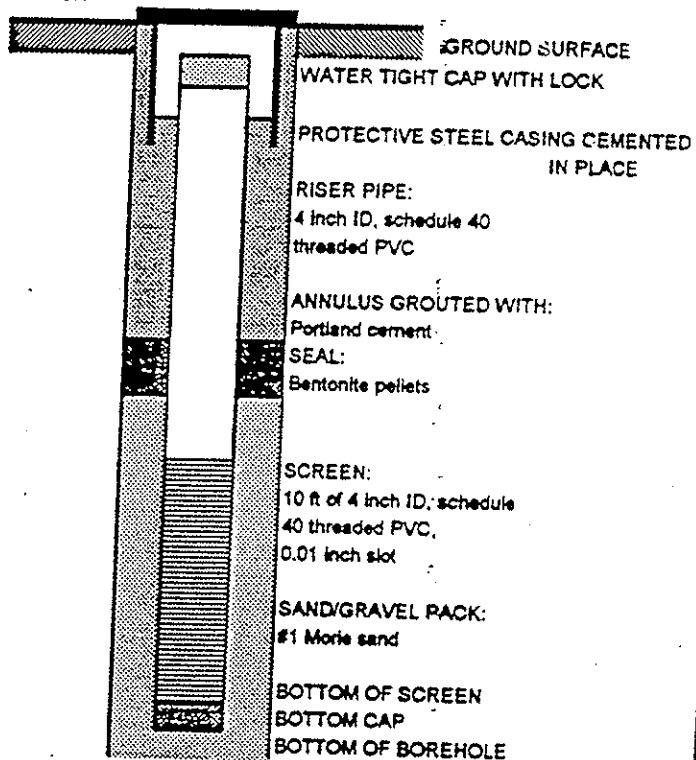
14-14.5 ft.: Brown SAND
dense, some gravel and
weathered bedrock, wet.

22.14	A	0
22.12	B	0.02

21.14	C	1
19.14	D	3
18.14	E	4

8.14	F	14
8.14	G	14
8.14	H	14

FLUSHMOUNT (ft)
0.1



DIAMETER OF
BOREHOLE:
8"

REMARKS (Installation, development):

MATERIALS: 10 FT OF 4" SCH 40 PVC SCREEN, 4 FT OF 4" SCH 40 PVC RISER, 1 BOTTOM CAP, 3 BAGS OF #1 SAND, 1 BUCKET OF BENTONITE PELLETS, 4 BAGS OF PORTLAND CEMENT, 1 FLUSH MOUNT CASING.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER MW-124B

Project name & location	Well lock No.	Elevation datum
PELHAM BAY LANDFILL, BRONX, NEW YORK	3220	Bronx Datum (BD) 2.608 ft. above MSL.
Drilling company	Surveyor	Ground elevation
WARREN-GEORGE, INC.	ETTLINGER & ETLINGER	20.90 ft.
Date and time of completion	Northing	Top of protective steel casing elevation
7/7/82	26520.305	21.00 ft.
Inspector	Easting	Top of riser pipe elevation
R. Coste	-20800.743	20.60 ft.

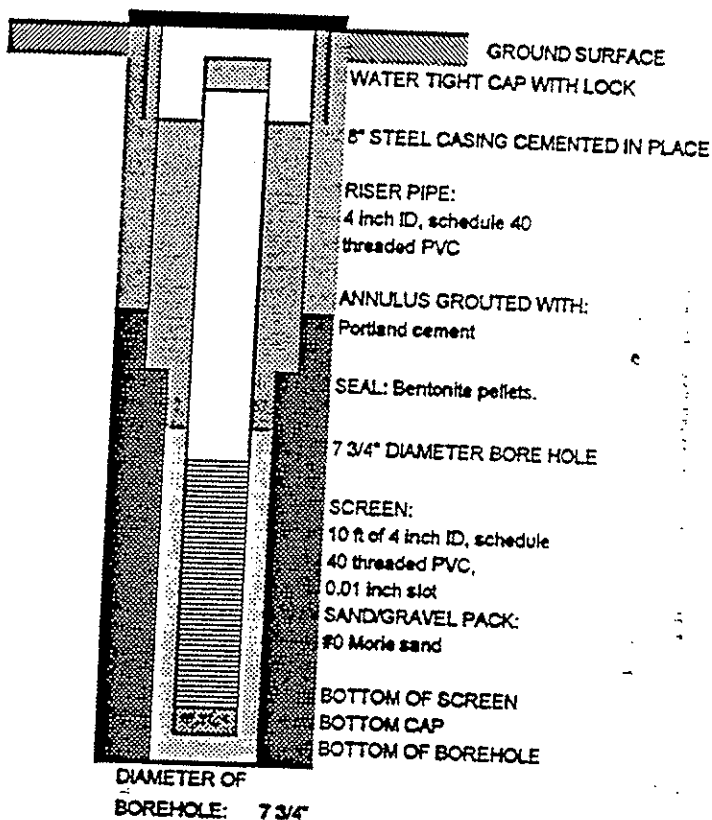
	ELEV.		DEPTHS
	(ft. above/ below BD)		(ft. below/ above ground)
A = Ground Surface			
B = Top of PVC Riser	20.90	A	0
C = Top of Bedrock	20.60	B	0.3
D = Bottom of 8" Casing			
E = Top of Bentonite Seal			
F = Top of Sand Pack			
G = Top of Screen			
H = Bottom of Screen			
I = Bottom of PVC/Steel			
J = Bottom of Borehole			

**GENERALIZED
SOIL DESCRIPTION**

0-13 ft.: Brown SAND.

13-63 ft.: Biotite, garnet, quartz SCHIST.	0.93	C	19.97
	-6.07	D	26.97
	-9.07	E	29.97
	-11.07	F	31.97
	-39.07	G	59.97
	-49.07	H	69.97
	-49.07	I	69.97
	-49.07	J	69.97

FLUSHMOUNT (ft)
0.1



REMARKS (Installation, development):

MATERIALS: 20 FT 8" STEEL CASING; 10 FT 4" SCH 40 PVC SCREEN, .010 SLOT; 60 FT 4" SCH 40 PVC RISER; 1/2 BUCKET BENTONITE PELLETS; 5 BAGS #0 MORIE SAND; 7 BAGS PORTLAND CEMENT; 1 BOTTOM CAP; 1 FLUSHMOUNT WELL CAP W/ LOCK.

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

CONSTRUCTION OF WELL / PIEZOMETER MW-126

Project name & location	Well lock No.	Elevation datum
PELHAM BAY LANDFILL, BRONX, NEW YORK	3220	Bronx Datum (BD) 2.608 ft. above MSL
Drilling company	Surveyor	Ground elevation
WARREN-GEORGE, INC.	ETTLINGER & ETTINGER	124.12 ft
Date and time of completion	Northing	Top of protective steel casing elevation
7/11/92	27770.025	125.23 ft
Inspector	Easting	Top of riser pipe elevation
R. Costa	-19860.461	124.68 ft

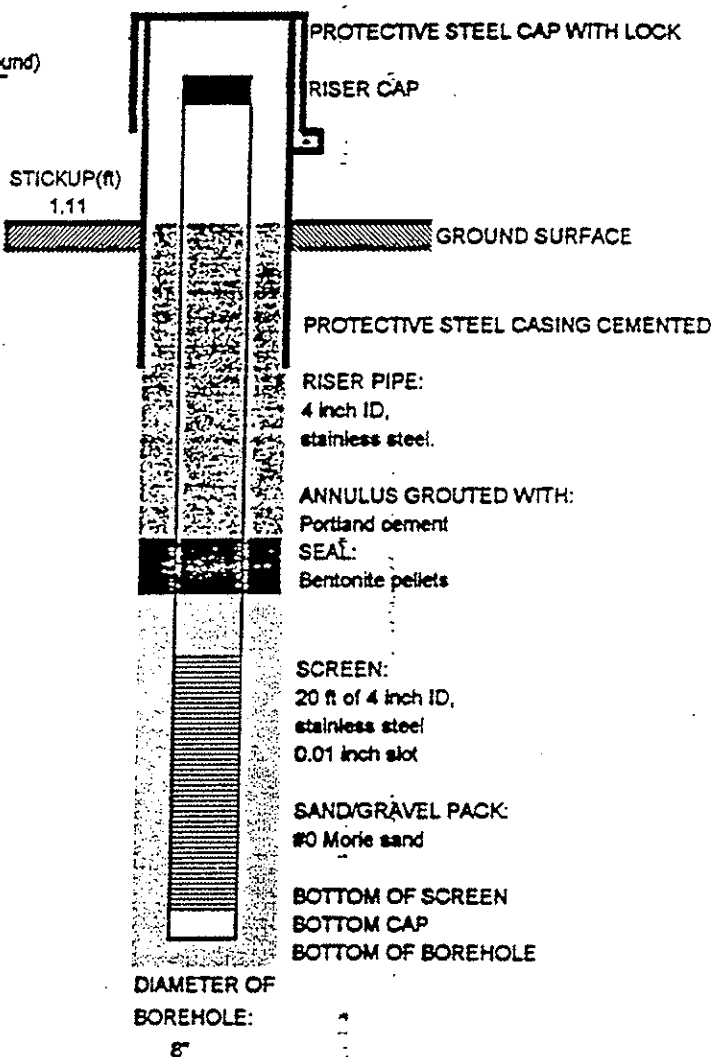
	ELEV.	DEPTHS
	(ft above/ below BD)	(ft below/ above ground)
A = Top of Riser		
B = Ground Surface		
C = Top of Bentonite Seal		
D = Top of Sand Pack	124.68	A 0.56
E = Top of Screen		
F = Bottom of Screen		
G = Bottom of PVC/Steel		
H = Bottom of Borehole		

GENERALIZED
SOIL DESCRIPTION

0-139 ft.: Black, decomposed
REFUSE including plastic, wood, metal,
rubber, cloth, and glass.

11.12	C	113
9.12	D	115
5.12	E	119

-14.88	F	139
-14.88	G	139
-14.88	H	139



REMARKS (Installation, development):

MATERIALS: 20 FT OF 4" STAINLESS STEEL SCREEN, 109 FT OF 4" STAINLESS STEEL RISER, 1 STAINLESS
STEEL BOTTOM CAP, BAGS OF #10 SAND, BUCKETS OF BENTONITE PELLETS, BAGS OF PORTLAND CEMENT,
1 6" STICK UP CASING.

