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Pride Solvents

WORK PLAN FOR THE FOCUSED REMEDIAL INVESTIGATION/ FEASIBILITY STUDY

West Babylon, New York
(Site Code #1-52-025)
(WA #D003970-02.2)

May, 2000
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Prepared for:
New York State Department of Environmental Conservation
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Albany, New York 12233

Environmental Resources Management
175 Froehlich Farm Boulevard
Woodbury, New York 11797

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LIST OF ACRONYMS

ASP	Analytical Services Protocol
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Emergency Response, Compensation and Liability Act
CLP	Contract Laboratory Program
EA	Exposure Assessment
EC	Electrical conductivity
ELAP	Environmental Laboratory Accreditation Program
EM	Electromagnetic
ERM	Environmental Resources Management
FRI/FS	Focused Remedial Investigation/Feasibility Study
GPR	Ground Penetrating Radar
HASP	Health and Safety Plan
HEEA	Health and Environmental Exposure Assessment
MC	Macro Core
NGVD	National Geodetic Vertical Datum
NCP	National Contingency Plan
NTUs	Nephelometric Turbidity Units
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
SCDHS	Suffolk County Department of Health Services
OSWER	Office of Solid Waste and Emergency Response
PID/FID	photoionization detector and flameionization detector
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
QAO	Quality Assurance Officer
RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RF	Radio frequency utility locator
SCDHS	Suffolk County Department of Health Services
SCGs	Standards, Criteria, and Guidelines
SDG	sample delivery group
SOPs	Standard operating procedures
SOW	Statement of Work
SPDES	State Pollution Discharge Elimination System

SVOCs	semivolatile organic compounds
TAGM	Technical And Administrative Guidance Memorandum
TCL/TAL	Target Compound List/Target Analyte List
TVOCs	total volatile organic compounds
USGS	United States Geological Survey
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOCs	volatile organic compounds

1.0 INTRODUCTION

The Pride Solvents and Chemical Company is located at 78-88 Lamar Street in West Babylon, Suffolk County, New York. The Site is located within an industrial park known as the West Babylon Industrial Area. A site location map is provided in Figure 1-1.

The site is approximately 1.38 acres in size and contains two buildings with parking lots to the north and south and a loading dock between the buildings (see Figure 1-2). Directly to the north, south and west are various other commercial and manufacturing facilities. Approximately 500 feet to the west of the site is the Babylon Town Landfill. Cemeteries border the industrial park to the north, east and south.

The property has been owned and occupied by the current owner since 1973. The facility operates as a chemical and solvent distribution and solvent reclamation facility. The site is currently regulated as a hazardous waste treatment, storage and disposal facility under a Resource Conservation and Recovery Act (RCRA) Part B Permit (EPA ID No. NYD 057722258). Pride Solvents was listed on the Registry and as a Class 2 site in 1983. Pride Solvents is equipped to receive and store chlorinated and fluorinated solvent waste, then reclaim the material by a distillation process. The reclaimation/distillation is carried out in a portion of the 78 Lamar Street building. The remaining use of this building is for drum storage. The operation at 88 Lamar Street primarily consists of bulk storage, packaging and distribution of non-flammable, flammable and combustible organic solvents.

The Suffolk County Department of Health Services (SCDHS) cited the facility with several violations of its State Pollution Discharge Elimination System (SPDES) permit during the early 1980s. In March of 1980 samples obtained from two storm drains on the property, contained trichloroethylene (3110 ug/l and 458 ug/l) above concentrations allowed by the SPDES permit. In November of 1982 samples were again obtained from a storm drain which contained toluene (4600 ppb) above the SPDES permit limitations.

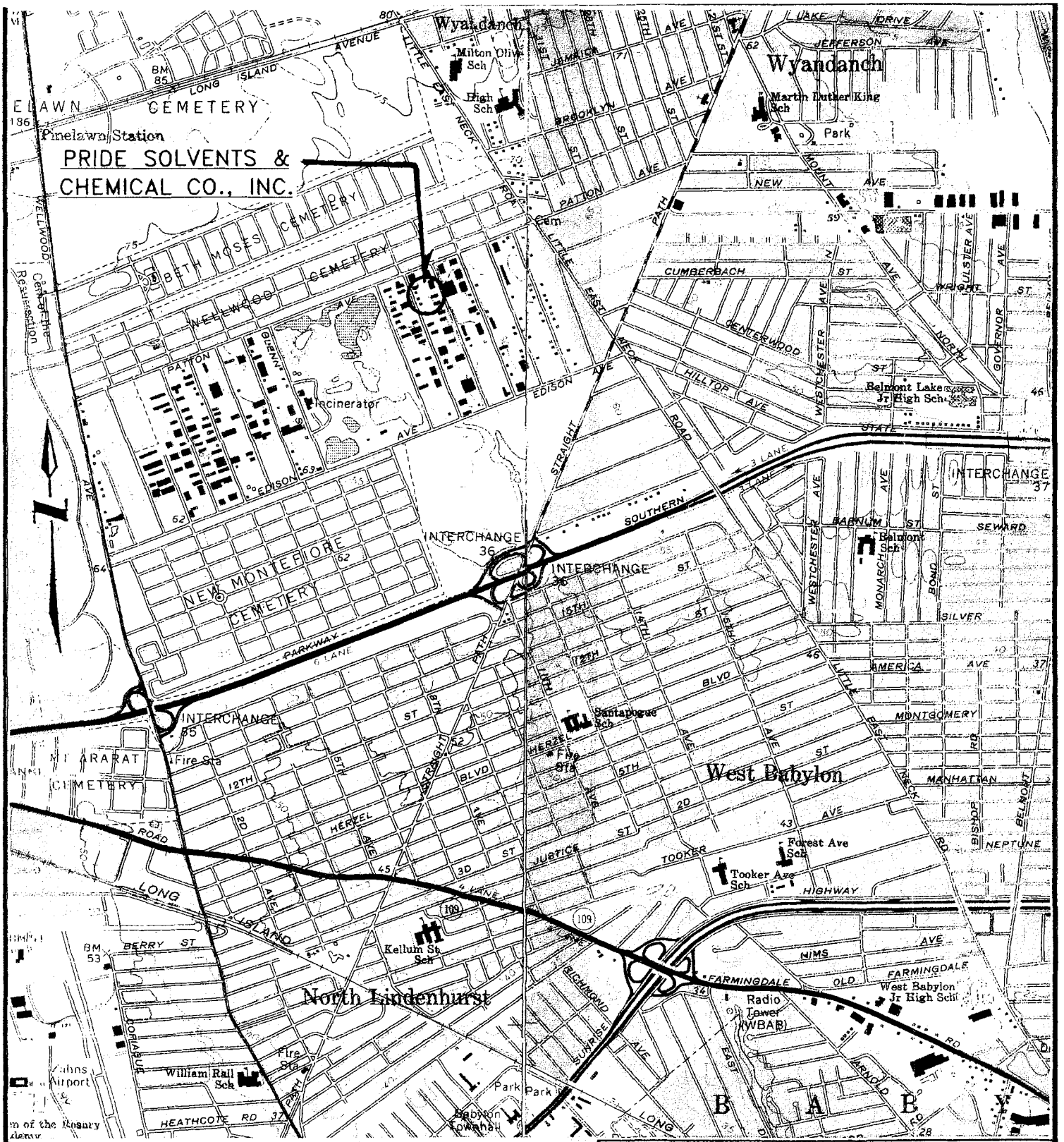
Remedial Investigation/Feasibility Study

This document, entitled "Focused Remedial Investigation/Feasibility Study (FRI/FS) Work Plan, Pride Solvents, West Babylon, New York", presents the planned activities to be performed. The FRI/FS Work Plan incorporates the required elements as set forth in the federal

Comprehensive Emergency Response, Compensation and Liability Act (CERCLA), the National Contingency Plan (NCP), the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) No. 4025 entitled "Guidelines For Remedial Investigations/Feasibility Studies", and the United States Environmental Protection Agency (USEPA) guidance document entitled "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA."

The goals of the FRI/FS will focus on the following:

- Evaluate the nature and extent of on-site and off-site ground water contamination;
- Determine if Pride Solvents is the source of off-site ground water contamination;
- Define pathways of contaminant migration;
- Determine potential receptors and impacts;
- Evaluate the need for corrective actions; and
- Identify and evaluate remedial measures.



SOURCE:

NEW YORK STATE QUADRANGLE MAPS
AMITYVILLE AND BAYSHORE, N.Y.

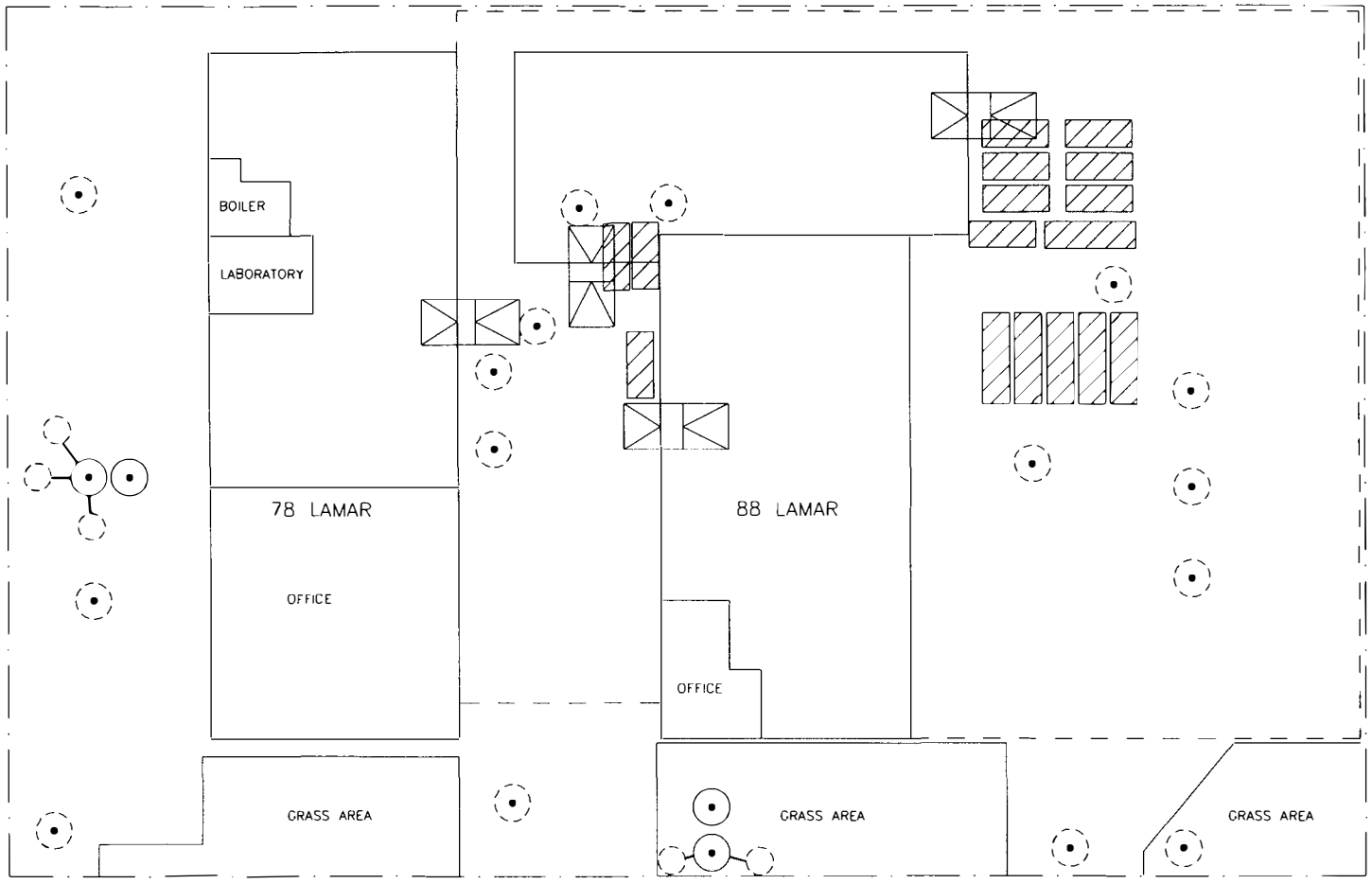
TITLE

SITE LOCATION
PRIDE SOLVENTS
NYSDEC I.D. NO 1-52-025

PREPARED FOR

NYSDEC

ERM Environmental Resources Management			SCALE 1"=2,000'	FIGURE 1-1
DRAWN: G.G.	JOB NO.: 72702.00.01	FILE NAME: MANUAL	DATE 1/7/00	



TITLE

SITE PLAN
PRIDE SOLVENTS & CHEMICAL CO
WEST BABYLON, NY

PREPARED FOR

NYSDEC

ERM Environmental Resources Management

SCALE	FIGURE
1"=40'	1-2

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2.0 SITE EVALUATION

The FRI/FS relies on all existing information and reports. As a result, most of the following subsections contained within Section 2.0 – Site Evaluation have been excerpted with minor modifications from several investigations conducted for the NYSDEC and Pride Solvents & Chemicals Company Inc.

2.1 SITE HISTORY

Pride Solvents and Chemical Company is an inactive facility that specialized in recycling and distributing solvents. The site is located at 78-88 Lamar Street in West Babylon, Suffolk County, New York. The site is located within an industrial park known as the West Babylon Industrial Area. Pride Solvents has been the sole owner of the property since 1973.

Pride Solvents had operated the facility since at least 1979 until 2001. Pride Solvents was issued a SPDES permit on March 14, 1979. SCDHS cited the facility with violations of its SPDES permit in 1980 and 1982. In March of 1980 samples obtained from two storm drains on the property contained trichloroethylene (TCE) (3110 ug/l and 458 ug/l) above concentrations allowed by the SPDES permit. In November of 1982 samples were obtained from a storm drain which contained toluene (4600 ppb) above the SPDES permit limits.

In 1982, the facility completed extensive modifications and SCDHS inspected the site to ensure the overall compliance of the facility with Article XII of the Suffolk County Sanitary Code. Pride Solvents was approved for operation by the SCDHS in April of 1982. The construction included the installation of 16 underground storage tanks and 12 aboveground storage tanks.

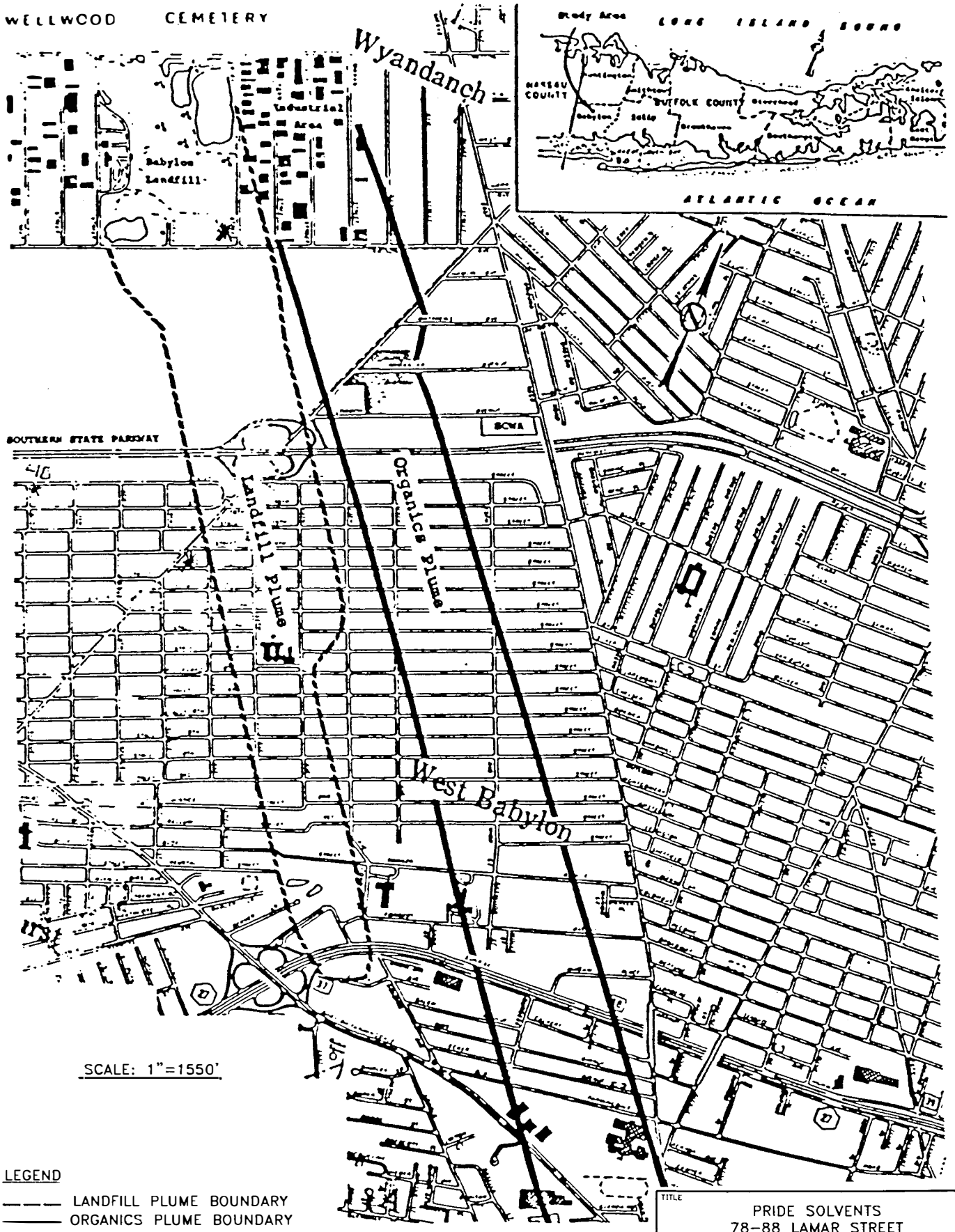
In 1995, a new permit was issued to Pride Solvents and Chemical Company, Inc. for the operation of a commercial hazardous waste container storage and solvent reclamation facility by the NYSDEC under Article 27, Title 7; 6NYCRR 360: Solid Waste Management. Authorized Activities included, a total storage capacity of 19,800 gallons (360 fifty-five gallon drums) of halogenated used solvents from off-site, an indoor container storage area for screenings, sludge and still bottoms generated from on-site reclamation. The reclamation of used solvents is carried out in one 650 gallon settling tank, one 600 gallon distillation tank, three

distillate storage tanks with a total capacity of 2775 gallons. All five tanks are aboveground storage tanks.

Numerous reports have been generated pertaining to Pride Solvents and Chemical Company and/or the surrounding industrial area. The following is synopsis of these reports.

In December of 1983 the SCDHS prepared the investigation report "Investigation of an Industrial Organic Chemical Plume in Ground Water: West Babylon, New York." This investigation was carried out because elevated concentrations of organic chemicals were detected in residential wells south of the industrial area. The SCDHS installed a total of 32 "profile wells" from depths ranging from 40 to 70 feet below grade. Ground water samples were obtained at ten-foot intervals from the water table to the bottom of each boring. Findings of the report indicate a "plume that clearly originates from the industrial area located east of the Babylon Town Landfill." Figure 2-1 illustrates that the organic plume and the landfill plume originate from separate areas, with the organic plume to the east and emanating from the industrial park that contains Pride Solvents.

Sample results reported within the 1983 report indicate concentrations of the organic solvent tetrachloroethylene (PCE) and its breakdown products, the industrial solvent 1,1,1 trichloroethane (1,1,1-TCA) and its breakdown products, Freon 113, methylene chloride (MeC), benzene, toluene and xylenes. Maximum concentrations observed within the West Babylon Industrial Area, down gradient of the Pride Solvents site, include PCE at 750 ppb, TCE at 7600 ppb, TCA at 2500 ppb and MeC at 570 ppb. Farther down gradient of the Industrial Area, still within the organic plume, the maximum concentrations observed included PCE at 13000 ppb, TCE at 13000 ppb, cis-dichloroethylene at 6400 ppb, TCA at 25000 ppb, MeC at 170 ppb and BTEX at 621 ppb. The plume extends an estimated 2 to 3 miles down gradient of the West Babylon Industrial Area, with the highest concentrations, at the time of the report, approximately 0.5 mile down gradient.


WELLWOOD CEMETERY
Wyandanch
Industrial Area
Babylon Landfill
Study Area
LONG ISLAND SOUND
NASSAU COUNTY
SUFFOLK COUNTY
ATLANTIC OCEAN
SOUTHERN STATE PARKWAY
SCWA
Landfill Plume
Organics Plume
West Babylon
SCALE: 1"=1550'
LEGEND
LANDFILL PLUME BOUNDARY
ORGANICS PLUME BOUNDARY
ALL PLUME BOUNDARIES ARE APPROXIMATE.
SOURCE: INVESTIGATION OF AN INDUSTRIAL ORGANIC CHEMICAL PLUME IN GROUND WATER: WEST BABYLON, NY. SCDHS, 1983
TITLE
PRIDE SOLVENTS
78-88 LAMAR STREET
WEST BABYLON, NEW YORK
PREPARED FOR
NYSDEC
ERM
Environmental Resources Management
SCALE
1"=1550'
FIGURE
2-1
DRAWN
G.G.
JOB NO.
72702
FILE NAME
MANUAL-3
DATE
4/21/00

In 1984, a report and work plan was prepared by Woodward-Clyde Consultants, Inc. for the Pride Solvents site. The report was a Phase I-Preliminary Investigation with a proposed work plan for Phase II. The report presented a Hazard Ranking System (HRS) score for the facility. The report identifies incidences where SCHDS sampled on-site storm drains in 1980 and 1982 and found TCE, PCE, methylene chloride and toluene contamination. The report also contains a listing of storage tanks at the site. The list includes: 16 underground storage tanks ranging in size from 1500 to 6000 gallons, 8 inside storage tanks with 5000 gallon capacities and 4 aboveground storage tanks ranging in size from 1500 to 2000 gallons. Also included was a list of 672 drums stored on-site. Table 2-1 provides a list of the contents of the storage tanks and drums as of 1981 and Table 2-2 provides a list of the contents of storage tanks and drums as of 1991.

In 1990, a total of 12 Underground Storage Tanks (USTs) were removed from the site and 4 USTs were abandoned in place. This accounted for all of the USTs that were listed for the site. None of the tanks were visually observed to have leaked. A total of 50 cubic yards of contaminated soil was removed during the excavation.

The H2M Group conducted a "Report on Hydrogeologic Investigation" in 1991 for Pride Solvents & Chemical Company, Inc. The investigation was completed to comply with the requirements of Corrective Action Program in Module III of Pride's RCRA Part B Permit. The investigation included the installation of five (5)-monitoring wells, soil sampling, ground water sampling and a soil gas survey. The soil gas was conducted at 24 points and revealed PID soil vapor concentrations of 0 to 106 ppm. Four surface soil samples were obtained; three of which were from alleged previous spills and one from the highest soil gas PID reading point. No exceedences were noted as per the report. A total of five soil samples were obtained during the well installations from above the water table. Several volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) were detected particularly in MW-2 (down gradient well); however, no concentrations were above then current NYSDEC Guidance Values. Four of the wells were installed to 20 feet with 10-foot screens and one well was installed to 50 feet also with a 10-foot screen. The 50 foot well is located at the up gradient edge of the site. Two rounds of ground water samples were obtained during this investigation. Sample results indicated that ground water underlying the site was impacted with volatile, semi-volatile and inorganic compounds above then current NYSDEC Guidance Values. The highest concentrations were detected in MW-1.

Table 2-1
1981 Bulk Material Storage and Drum Storage Inventory
Bulk Material Storage

Chemical	Storage Gallons
VARSOL #3	3000 (1)
LOPS	3000 (1), 5000 (1)
DIESEL FUEL	3000 (1)
VARSOL #18	6000 (1)
VARSOL #1	6000 (1)
DOW EB	5000 (2)
ORTHO	2000 (3)
DOW DE	1500 (3)
XYLOL	3000 (1)
VM&P	3000 (1)
LAKTANE	3000 (1)
METHANOL	3000 (1)
TELSOL 190	3000 (1)
GASOLINE	3000 (1)
TOLUOL	6000 (1)
ACETONE	6000 (1)
ISO ALCOHOL	6000 (1)
MEK	6000 (1)
1,1,1-TRICHLOROETHANE	5000 (2)
METHYLENE CHLORIDE	5000 (2), 1500 (3)
TETRACHLOROETHYLENE	5000 (2), 5000 (2), 1500 (3)
TRICHLOROETHYLENE	5000 (2)
TRICHLOROETHANE	5000 (2), 5000 (2)

(1) below grade tank
(2) inside storage
(3) outside storage above grade

Table 2-1
1981 Bulk Material Storage and Drum Storage Inventory
Drum Storage

Chemical		Number of Drums
Acetone		11
All Trichloroethane		95
Antifreeze		17
Aromatic 150		4
Nbutyl Acetate		3
Sec. Butyl Alcohol		3
Carbon Tetrachloride		2
Oil		44
Diactone Alcohol		15
Dibutyl Phthalate		3
Diethanolamine		10
Diethylene Glycol		9
Diethylene Triamine		2
Diisopropanolamine		1
DioctylyPhthalate		3
Dipropylene Glucose		8
Dowanol DE		4
Dowanol EB		9
Dowanol EE		7
Dowanol EM		2
Dowanol EPH		3
Dowanol TPM		7
EE Acetate		1
EAK		5
Ethyl Acetate 99		3
Ethylene Dichloride		4
Ethylene Glycol		18
Freons:	TF	18
	TES	7
	TMC	6
	TMS	16
	TA	2
	TDF	3
	TDFC	1
	TP35	1
	MF	1
	TWD602	3
	TE	2
Glycerine		8
HAN		4
Heptone		6
Herylene Glycol		3
Isobutyl Acetate		1
Isobutyl Alcohol		1
Isopropanol		10
TXIB		1

Table 2-1
1981 Bulk Material Storage and Drum Storage Inventory
Drum Storage

Chemical	Number of Drums
Lacquer Thinner	4
Methanol	4
Metrylene Chloride	10
MEK	7
MIAK	1
Mineral Spirits	13
Monochlorobenzene	1
Monoethanolamine	2
Monoisopropanolamine	10
Morpholine	7
N. Propyl Acetate	4
N. Propyl Alcohol	3
Orhodichlorbenzene	2
Perchloroethylene	16
Polyethylene Glycol	12
Polypropylene Glycol	2
Propylene Glycol	32
Rubber Solvent	1
Surfonic N-95	8
Shell Solv 71	16
Styrene Monomer	7
Ethyl Alcohol	30
Texanol	3
Shell Sol B	3
Toluene	6
1,1,2-Trichloroethane	2
Trichloroethylene	16
Tetra Ethylene Glycol	5
Triethanolamine	26
Tripopylene Glycol	8
Triisopropanolamine	3
Vinyl Toluene	4
VMP	1
Xylol	10

Source: Engineering Investigation at Inactive Hazardous Waste Sites in the State of New York, Pride Solvents and Chemical Company Site, Woodward - Clyde Consultants, Inc., 1984

Table 2-2
1991 Bulk Material Storage and Drum Storage Inventory
Bulk Material Storage

Chemical	Storage Gallons
Xylol (dimethylbenzene)	3000 (1)
VM & P (naptha) (A)	3000 (1)
Laktane (mixture C7-C8) (A)	3000 (1)
Varsol #3 (stoddard solvent) (C)	3000 (1)
Methanol (methly alcohol) (A)	3000 (1)
Aromatic 100 (C)	3000 (1)
EMPTY	3000 (1)
Diesel Fuel (C)	3000 (1)
Gasoline (A)	3000 (1)
LOPS (aliphatic solvent (C)	5000 (1)
Toluol (methyl benzene) (A)	6000 (1)
Acetone (dimethyl ketone) (A)	6000 (1)
150 Alcohol (isopropyl alcohol) (A)	6000 (1)
MEK (methyl ethyl ketone) (A)	6000 (1)
Varsol #18 (stoddard solvent) (C)	6000 (1)
Varsol #1 (stoddard solvent) (C)	6000 (1)
Reclaimed Cyclothane (1,1,1-trichloroethane) (B)	5000 (2)
Methylene Chloride (B)	5000 (2)
Perchloroethylene (tetrachloroethylene) (B)	5000(2)
Trichloroethylene (B)	5000 (2)
Chloro-SM (1,1,1-trichloroethane) (B)	5000 (2)
Reclaimed (1,1,1-trichloroethane)	5000 (2)
Relclaimed (trichloroethylene) (B)	5000 (2)
DOW DM (methyl carbitol diethylene glycol methyl ether) (C)	5000 (2)
Freon (fluorinated solvent) (B)	5500 (2)

Notes: (all removed or abandoned as of 1990)

(1) Outside storage, below grade
(2) Inside storage, above grade

(A) flammable
(B) non-flammable
(C) combustible

Table 2-2
1991 Bulk Material Storage and Drum Storage Inventory
Drum Storage

Chemical	Number of Drums
Acetone	11
1,1,1-Trichloroethane	25
Anti-freeze	4
Aromatic 150	4
Nbutyl Acetate	1
Sec. Butyl Alcohol	0
Carbon Tetrachloride	0
Diacetone Alcohol	0
Dibutyl Phthalate	0
Diethanolamine	0
Diethylene Glycol	1
Diethylene Triamine	0
Diisopropanolamine	0
DioctylyPhthalate	1
Dipropylene Glycol	10
Dowanol PM	5
Dowanol EB	3
Versene 100 Liquid	3
EE Acetate	4
Ethyl Acetate 99	7

Source: Report on Hydrogeologic Investigtion Pride Solvents & Chemical Company, Inc., H2M Group, 1991

The "Babylon Plume Tracking Investigation" report prepared by Engineering-Science in 1992 further investigated ground water VOC plumes detected from previous reports. The investigation focused on the Pinelawn Industrial Area (a.k.a. West Babylon Industrial Area) which encompasses both the west and east sides of the Babylon Town Landfill. A total of 45 borings were installed throughout the industrial area. Samples were obtained from slotted augers at three intervals, 20 to 30 feet below grade, 50 to 60 feet below grade and 75 to 90 feet below grade. Results indicated distinct differences in the occurrence and distribution of contaminants between the west and east side of the landfill. On the west side, several compounds, notably TCE and PCE were detected near the bottom of the Upper Glacial aquifer. Concentrations ranged from 65 to 402 ug/l of total chlorinated organics, respectively. On the east side of the landfill contamination was limited to the shallow portion of the Upper Glacial aquifer. Areas identified to the east were: Southern Dale St-PCE, TCE, 1,2-DCE in shallow and middle zones; Southern Nancy St-PCE, TCE, 1,1-DCE, VC in shallow. Of particular importance were the contaminants detected down gradient of the Pride Solvents Site in the areas of: Southern Lamar/Mahan St.-TCE, 1,2-DCE, 1,1,1-TCA in shallow and middle zones, PCE at a shallow depth and Middle Lamar St.-1,1,1-TCA at the shallow depth.

A 1993 Hydrogeologic Investigation Report was generated by Tyree Brothers Environmental Services, Inc. The 1991 H2M report described above was used as the basis of the Tyree report; however, Tyree recollected ground water, surficial soil and borehole samples from the same locations as H2M did in 1991. Borehole sample results indicated ground water impacts by low levels of methylene chloride and several phthalates. Metals were within range of those naturally occurring in New York State. Surficial soils contained low levels of methylene chloride phthalates and PCE at 99 ppb (northwest of 88 Lamar Street). Down gradient ground water samples contained 1,1,1-TCA, PCE, and TCE. MW-1 also contained 1,1-DCA, 1,2-DCE, toluene, ethylbenzene and xylenes. Concentrations in MW-1 were as high as 2400ppb for 1,2 DCE. Phthalates were also detected in the ground water along with several chlorobenzenes. Metals including chromium, copper, iron, lead, manganese and sodium were detected aboveground water standards in various wells. It was also noted in this report that 12 underground storage tanks were removed and Tyree abandoned four underground storage tanks in place during December of 1990. No tanks were visually observed to be leaking.

In 1994, N. Dennis Eryou, PH.D, P.E. conducted an Assessment of the Hazardous Waste Storage Tank System on behalf of Pride Solvents &

Chemical Company, Inc. The report indicated that the Site was designed as per 6 NYCRR 373.3-3.10 (b) (2) (I) with no evidence of improper construction or operation of system components. The tank integrity testing indicated that none of the hazardous waste storage tanks were leaking.

Tyree Brothers Environmental Services, Inc. prepared an "Investigation Summary Report of Pride Solvents" in July of 1996 for Pride Solvents. The investigation included the installation of six (6) additional monitoring wells, ten (10) Geoprobe borings to depths of between 5 and 10 feet below grade, sanitary system sampling, leaching basin/drywell sampling and ground water sampling of the newly installed wells. The monitoring wells were all 20 feet in depth with 15 feet of screen.

One soil sample (located between 78 and 88 Lamar Street) obtained from the Geoprobe activity contained 790 ppb of PCE. Several phthalates were detected in eight of the Geoprobe Soil samples. Iron was the only metal above guideline values. The sanitary systems at both 78 and 88 Lamar Street were also sampled. There are several leaching pools associated with each system. Sludge sampling results for a pool at 88 Lamar Street contained 1,1-DCA, 1,2-DCE, 1,1,1-TCA, TCE and PCE. Concentrations ranged from 150,000 ppb for 1,2-DCE to 8,500,000 ppb for PCE. Again phthalates were also detected along with 1,2,4 trichlorobenzene (11,000 ppb) and naphthalene (5,800 ppb). Several metals including barium, cadmium, chromium, copper, iron and lead were detected. The pools located at 78 Lamar St. contained low levels (less than 10 ppb) of 1,1-DCA, 1,2-DCE, 1,1,1-TCA, TCE and PCE. Toluene was detected in three pools as high as 4300 ppb. Semi-volatile compounds detected included several chlorobenzenes, phthalates, 4-chloroaniline and 3- and 4-methylphenol. Similar metals were encountered as in the pools at 88 Lamar Street.

Semi-volatiles detected included several phthalates, pyrenes and fluoranthenes. Metals including aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury and zinc were above guidance values. Leaching basin sediment results included TCE (< 24 ppb) and toluene in one basin at 180 ppb. Semi-volatile compounds again included the phthalates, pyrenes and fluoranthenes. Similar metals were found in the sediments as were in the liquid results.

Results from the six new ground water monitoring results indicated concentrations of 1,1-DCA, 1,2-DCE, 1,1,1-TCA, TCE and PCE all less than 180 ppb. Semi-volatile results indicated 1,2,4-trichlorobenzene at 41 ppb in one well and two phthalates were detected. Metals detected above guidelines were aluminum, chromium, iron, manganese and sodium.

An additional round of ground water samples was obtained from the eleven wells on the Site on 14 December 1998 and analyzed by H2M Laboratories. The sampling was conducted for the NYSDEC and was the first sampling event that included all eleven on-site wells. Results indicated concentrations of 1,1-DCA, 1,2-DCE, 1,1,1-TCA, TCE and PCE. Results were less than 38 ppb. The highest concentrations were detected in MW-1, a down gradient well. The up gradient well MW-5 did not contain any concentrations over method detection limits.

A 1998 IRM report was generated for the site. The IRM included cleaning out two sanitary systems and one leaching pool due to elevated levels of VOCs and SVOCs.

Dvirka and Bartilucci provided preliminary data tables and draft site maps to the NYSDEC in 1999 regarding offsite properties. The information was in reference to Preliminary Site Assessments conducted at 65 Edison Avenue, down gradient of Pride Solvents, and 69-71 Kean Street, cross gradient to the west of Pride Solvents. Ground water samples (undetermined depth) were obtained by Geoprobe. VOCs and sediment samples were obtained from on-site drywells. Contaminants encountered at the Edison Avenue site included Acetone and 2-Butanone in both the ground water and drywell sediments. Contamination at the Kean Street site consisted of acetone, carbon disulfide and 2-Butanone in the ground water. Contaminants in the drywell sediments consisted of 1,1,1-TCA (maximum of 45 ug/l), chloroethane (maximum of 14 ug/l), ethylbenzene (maximum of 97 ug/l), toluene (maximum of 15 ug/l), 1,2-DCE (maximum of 44 ug/l) and total xylenes (maximum of 490 ug/l).

Environmental Resources Management (ERM) conducted a preliminary off-site investigation of Pride Solvents in 2000. The investigation included the installation of seventeen-(17) profile ground water sampling locations to the approximate top of the Gardiners Clay (about 80 feet below grade). Three to seven ground water samples were collected at each profile location. Eight (8)-monitoring wells were installed to supplement the data obtained from the profile sampling points. The wells were installed in pairs with screened zones at the water table and at the top of the Gardiners Clay.

Ground water sampling detected PCE in the ground water. Two downgradient profile locations contained PCE at concentrations of 1500 ppb and 5000 pbb in the zone just above the clay layer. Ground water sampling results from the monitoring wells also revealed PCE in two of the deep wells (MW-1D and MW-2D) at concentrations between 160 ppb

and 850 ppb, respectfully. A full Remedial Investigation/ Feasibility Study Report will be conducted at the end of the current phase of work.

2.2 *SITE DESCRIPTION*

Pride Solvents and Chemical Company is located at 78-88 Lamar Street in West Babylon, New York. The site occupies 1.38 acres with two buildings connected by a loading dock area. Since 1979 the property has been occupied by Pride Solvents for the purpose of recycling and distributing solvents. The operation at 78 Lamar Street includes the reclamation of chlorinated and fluorinated solvents by distillation. The primary use of the building is for drum storage with a small portion delegated to the distillation process and some office space. The operation at 88 Lamar Street primarily consists of bulk storage, packaging and distribution of non-flammable, flammable and combustible organic solvents.

During a recent site visit several drywells/storm drains were noted within the parking lots to the north and south of the property as well as within the loading dock area. Several monitoring wells were also identified along the southern property boundary. The entire property is covered by either buildings or by asphalt except for grass areas in front of each building along Lamar Street.

The West Babylon Industrial Area surrounds the property. Numerous commercial and manufacturing buildings are located with the industrial area. Approximately 500 feet to the west of the site is the West Babylon Landfill. Cemeteries are located to the north and east and an open area to the south occupy the perimeter of the West Babylon Industrial Area.

2.2.1 *Land Use*

Pride Solvents and Chemical Company is located within an industrial park known as the West Babylon Industrial Area. The majority of buildings within the industrial area are used for commercial or manufacturing purposes with a small number of residential homes. There are four sites in the West Babylon Industrial Area, which have been classified as an NYSDEC Class 2 inactive hazardous waste.

Pride Solvents and Chemical Co. Spectrum Finishing

U.S. Electroplating Babylon Landfill

2.2.2 *Topography*

The Pride facility is located within the glacial outwash plain. The topography of the facility and surrounding area is nearly level with the exception of the nearby Babylon landfill. Average on-site elevation is approximately 60 feet above mean sea level. Slopes on the site are less than 3 percent. Due to development, the majority of the area surrounding the site is paved and surface runoff is to drywells/storm drains. Within the vicinity of the site are several surface water bodies. Santapoque Creek is the nearest downgradient surface water body. The creek is approximately 1.7 miles southeast of the site.

2.2.3 *Site Geology*

The southern half of Long Island, in which Pride Solvents and Chemical Company is located, consists of an outwash plain associated with the terminus of the Wisconsinan-age glacier. The outwash deposits below the West Babylon Industrial Area are approximately 90 feet thick and are referred to as the Upper Glacial aquifer. They consist of coarse quartz sand and some gravel. Beneath the Upper Glacial deposits is a distinct clay layer known as the Gardiners Clay. This unit consists of 10-13 feet of silty, gray clay. Depths of the clay range from 83-92 feet below grade in the industrial area. The Magothy Aquifer is located beneath the Gardiners Clay. (Engineering and Science, 1992)

2.2.4 *Site Hydrogeology*

Past reports have indicated that the ground water was encountered at depths ranging from 10 to 20 feet below land surface. During the 2000 investigation conducted by ERM ground water was encountered at approximately 17 feet below grade. Plotted ground water data from on-site wells indicate a gradient and flow direction similar to regional data (Kimmel and Braids[1]). The approximate flow direction is south-southeast with a gradient of 0.0017. A previous study in the area, conducted by Geraghty and Miller, indicated slight downward vertical gradient in the area (Engineering-Science, 1992) with primary flow laterally through the saturated zone of the Upper Glacial aquifer. Horizontal ground water velocity across the site was calculated as 3.2 feet per day, utilizing the

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[1] 1Kimmel, G.E. and Braids, O.C., Leachate Plumes in Ground Water from Babylon and Islip Landfills, Long Island, Geological Survey Professional Paper, 1980.

measured gradient of 0.0017, a permeability of 470 ft/day and a porosity of 25 percent (Kimmel and Braids[1]). This data is supported by calculations for head and gradient based on water table and potentiometric-surface altitudes of the Upper Glacial Aquifer from 1997 (Busciolano et al[2]). Similar south-southeasterly flow with a gradient of between 0.0011 and 0.0013 were determined.

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[2] Busciolano, R., Monit, J., and Chu, A., Water Table and Potentiometric-Surface Altitudes of the Upper Glacial, Magothy, and Lloyd Aquifers on Long Island, New York, in March-April, 1997, with a summary of Hydrogeologic Conditions, Water Resources Investigations Report 98-4019, USGS, 1998.

3.0 *PROJECT SCOPING AND INITIAL EVALUATION*

The scoping phase of the FRI/FS involved a review of data from previous investigations and meetings with representatives of NYSDEC. The scoping phase was intended to: determine the types of decisions that need to be made; identify the type and quality of the data needed to support those decisions; describe the methods by which data will be obtained and analyzed; and, prepare appropriate project plans documenting methods and procedures.

3.1 *PROJECT OBJECTIVES*

The objectives of the FRI/FS at this site are to:

- Evaluate the nature and extent of on-site and off-site soil and ground water contamination;
- Determine if Pride Solvents is the source of off-site ground water contamination;
- Define pathways of contaminant migration;
- Determine potential receptors and impacts;
- Evaluate the need for corrective actions; and
- Identify and evaluate remedial measures.

These objectives will be achieved through a series of investigative tasks that acquire data to characterize the environmental conditions at the site and determine the vertical and horizontal extent of physical and chemical contamination. Moreover, the investigative elements and data acquisition will be conducted in a manner to support identification and evaluation of remedial measures pursuant to:

- NYSDEC Technical and Administrative Guidance Memorandum (TAGM) on Selection of Remedial Actions at Inactive Hazardous Waste Sites (HWR-90-4030); and
- "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (EPA 540/G-89/004).

3.2 *CONTAMINATION PROBLEM DEFINITION*

Direct investigative techniques will be employed to properly characterize the vertical and horizontal extent of the contamination problem on-site and downgradient of the site. These techniques will focus on understanding the physical features of the site, along with the chemical composition of the environmental media most likely to be affected by any release of contaminants.

3.2.1 *Physical Features*

A property survey will be conducted to confirm the legal boundaries of the site. All relevant features including all structures, roads, fences, existing wells, drywells, underground utilities, power lines and fire hydrants will be depicted on the base map. Surrounding buildings will be included as part of the map based on tax maps and a site visit.

3.2.2 *Ground Water*

Numerous investigations have been conducted at the site as well as in the surrounding industrial area both to the east and west of the Babylon Town Landfill. From these investigations a good correlation has been made between regional and local ground water flow direction and gradient. Ground water in the area has historically ranged from 10 to 20 feet below grade. Flow direction has been determined to be in a south-southeasterly direction with a gradient of 0.0017. Horizontal ground water velocity across the site was calculated as 3.2 feet per day, utilizing the measured gradient of 0.0017, a permeability of 470 ft/day and a porosity of 25 percent (Kimmel and Braids[1]).

Except for one well, located along the upgradient edge of the site that has an overall depth of 50 feet, the wells currently located on the site were installed as water table wells. Consequently, the existing monitoring well network can only provide a limited understanding of contamination in the upper zone of the Upper Glacial aquifer. To more completely characterize the chemical quality of the ground water in the area of the site it will be necessary to sample at greater depth which will be achieved through ground water sampling using both direct push methodology and installation and sampling of additional new monitoring wells. As part of the FRI report ground water flow properties will be measured and/or calculated.

3.3 *PROJECT APPROACH*

This document presents the results of the scoping phase and contains the plans that detail the procedures and measurements that will yield the data needed to meet the objectives of the FRI/FS.

The field investigative tasks of the FRI/FS will consist of four tasks:

1) Geophysical investigation of the entire Pride Solvents site both inside and outside of the buildings.
2) Soil and ground water sampling via direct push profile borings at approximately 50 locations on- site and 10 locations off-site.
3) Soil sampling of fifteen (15) on-site drywells and sediment and liquid sampling of the two on-site septic systems and associated leaching pools.
4) Installation of ten (10) new monitoring wells (six on-site and four off-site) and ground water sampling of the 10 new wells and the eight wells installed during the 2000 investigation.

Section 4.2 will describe in detail the activities and approach for each of the above tasks.

Remedial action objectives will then be identified for impacted ground water and/or soil where unacceptable exposure pathways are identified. As part of the FRI Report, an exposure assessment will be performed following NYSDOH guidelines.

4.0 REMEDIAL INVESTIGATION

4.1 MOBILIZATION/DEMOBILIZATION

The mobilization task includes the planning and initial activities to support the field investigation. As part of the initial investigation activities ERM will perform the following:

- Mobilize equipment on an as-needed basis;
- Conduct field personnel orientation and Health and Safety Plan (HASP) meeting; and
- Conduct ambient air screening for total volatile organic compounds (TVOCs) using photoionization detector and flamionization detector (PID/FID) to establish background conditions prior to conductance of intrusive fieldwork.

The conclusion of activities will include:

- Demobilization of all equipment;
- Removal of containerized waste generated during the RI.

4.1.1 *Construction of Site Facilities*

This subtask will provide support for the field investigation and will include the items listed below:

- Location and construction of a containment area for soil cuttings, drums and purge water/development water drums. Based on access to a provided area, a fence with locking gate will be installed to hold all drums and material generated or used as part of the investigation.
- Communication with the Project Manager will be accomplished via cellular phone.

4.1.2 *Mobilize Equipment and Supplies*

This subtask will include all activities required to procure equipment and supplies and mobilize these items to the site. Resupply may be necessary for expendable supplies, though an effort will be made to procure, plan, order, and store the required expendables at ERM's warehouse located on Long Island.

4.1.3 *Field Personnel Orientation*

This activity will consist of an on-site project briefing for each field team member in order to become familiar with the history of Pride Solvents and the industrial area, the purpose of the remedial investigation, health and safety requirements, quality assurance protocols, and field procedures. Subcontractors involved in any field activities will also participate in an on-site briefing prior to commencing any fieldwork. Daily health and safety and field progress briefings will be held for the project team and subcontractor personnel conducted by the on-site safety coordinator.

4.1.4 *Demobilization*

All equipment will be demobilized from the Pride Solvent site at the completion of field sampling activities. All FRI generated wastes will be disposed of as prescribed in Section 4.3 - FRI Waste Management Disposal. Used personnel protective equipment will be placed in plastic bags, packed in 55-gallon ring-top drums, which will be sealed and labeled. These drums will be properly disposed of at the completion of all field activities (see Section 4.3, FRI Waste Management and Disposal).

4.2 *FIELD INVESTIGATION*

The FRI investigation has been designed to collect sufficient data to determine the extent of contamination in the area and evaluate if there have been impacts to human health or the environment and to determine how best to remediate the site consistent with the goals set forth in Section 3.1 - Project Objectives.

Accordingly, the scope of the FRI includes a field investigation that has been designed to initially obtain sufficient information to:

- Develop a reasonable understanding of the contamination located on-site and downgradient of the Pride Solvent site with particular interest in results at depth;
- Identify possible exposure routes for contaminants and identify potentially affected receptors; and
- Determine potential remedial alternatives.

The FRI will utilize techniques such as soil and ground water sampling at various depths within the Upper Glacial aquifer and the installation ground water monitoring wells with subsequent sampling. The following

is a detailed description of the objectives of the investigation and the techniques that will be utilized to accomplish these goals.

4.2.1 *Evaluation of Existing Data*

Available data regarding the Pride Solvents site will be reviewed and compiled to assist in evaluating the site. Data to be examined will include existing investigation reports contained in the files of the NYSDEC and the Suffolk County Department of Health Services.

4.2.2 *Geophysical Investigation*

A geophysical investigation will be conducted over the entire site using ground-penetrating radar (GPR), electromagnetic (EM), and radio frequency utility locating systems (RF). The combination of the GPR and EM surveys will primarily be utilized to determine the locations of any subsurface drainage features, the location of the on-site leaching pools, and the presence/absence of any USTs on-site.

A survey grid will be established over the entire site including inside the buildings (except for office areas) and outside all buildings prior to the collection of GPR and EM data. The GPR survey lines will be spaced at 10-foot intervals in two directions. The GPR survey will be conducted utilizing a GSSI SIR-2 imaging system and a 400-Megahertz (MHz) antenna. The EM survey lines will be spaced at either 5 or 10-foot intervals in one direction with data collected at 1-foot intervals. The EM survey will be conducted utilizing a Geonics EM61 instrument. The RF survey will be conducted primarily for utility clearance in the areas of proposed intrusive sampling activities. A Letter Report of Findings will be generated after all data has been collected. The report will include a description of survey procedures, a summary of field activities, results of the investigation, a relevant GPR profile, if applicable, and conclusions.

4.2.3 *Profile Borings*

4.2.3.1 *Profile Boring Installation*

Approximately 60 locations will be selected for profile sampling. Fifty of the locations will be on the Pride Solvents property and ten locations will be off-site in the downgradient direction from the site. Figure 4-1 provides a site map of the proposed on-site profile locations. Locations for the proposed on-site sampling may be moved based on the results of the geophysical investigation or other field determinations. Figure 4-2 provides the locations for the proposed downgradient sample locations.

resistivity as the probe is driven into a clay layer. The logs generated by the EC probe would be correlated with the MC soil samples obtained during the previously described clay delineation.

ERM proposes to utilize the EC probe at two of the four on-site soil borings that are being installed to determine the depth of the clay. At these locations, a second borehole using the EC probe will be advanced to the top of the clay at a location within 2 feet of the original boring. If a good correlation, between the depth of the clay as determined by the soil sampling and the depth the clay as determined by the EC probe, is found, then the EC probe would be substituted for the collection of soil samples at depth, particularly for the off-site locations to map the clay surface. Determination of the depth of the clay layer with the EC probe will be considerably faster and more cost-effective than continuous MC soil sampling at depth.

Ground Water Sampling

Ground water samples will be collected at all sixty sampling locations immediately following the completion of the soil sampling. The ground water samples will be obtained at 10-foot intervals starting at the top of the Gardiners Clay (as determined by the soil sampling or EC probe) and continuing upward to the water table. Ground water samples will be obtained using a SP15 screen point sampler. This sampler utilizes a screen with a standard slot size of 0.004 inch (0.1mm) with an exposed length of 41 inches.

The screen point sampler is driven to the desired depth. While the sampler is driven to depth, O-rings at the drive head and at the expendable drive point provide a watertight seal. Once the desired depth is achieved, chase rods are sent downhole to release the screen. The chase rods are then removed and the screen is revealed by retracting the drive rods. After the drive rods are retracted only water from the screened interval can enter through the screen and fill the drive rods.

Ground water samples will be obtained by placing new polyethylene tubing down the drive rods into the screened zone. The polyethylene tubing will be fitted with a ball and check valve and oscillated up and down to fill the tubing with water. Each sampling interval will be purged of approximately four volumes of water. Once the purging has been completed the tubing will be brought to the surface and decanted from the bottom of the tubing by removing the ball and check valve.

After completion of the water sampling at the zone just above the Gardiners Clay, the drive rods and screen will be retracted ten feet. Once the new zone is reached, new tubing will be placed into the screen zone. The new zone will then be purged and sampled as described above. This sampling procedure will be repeated every ten feet until the water table is reached.

The budget for the soil and groundwater sampling has been estimated based on performing three boring per day as required by the NYSDEC.

All soil and ground water samples obtained will be sent for laboratory analysis. The analysis will consist of target compound list (TCL) VOCs analysis using the NYSDEC Analytical Services Protocol (ASP) Method 95-1.

4.2.3.3 *Hydropunch Sampling*

All ground water and soil sampling is expected to be performed using direct push technology. However, particularly for the off-site sampling, if the clay layer is deeper than expected a drill rig will be mobilized to the site to perform ground water sampling using Hydropunch technology. Sample intervals will be the same as for the direct push method. At any location where Hydropunch sampling is utilized, 4.25-inch augers will be used to drill to the desired depth. The Hydropunch sampler will then be lowered through the augers and hammered approximately four feet into the undisturbed formation. The hammer rods will then be pulled back approximately three feet to reveal the screen. As the screen is revealed only water entering the screen zone can fill the hammer rods. A disposable bailer will be used to purge the sample interval of between one-half to one gallon of water. Once the purging is completed the bailer will be used to collect the sample. The sample will be transferred directly from the bailer into laboratory supplied bottles. Any samples obtained utilizing the Hydropunch technology will be analyzed in the same manner as the direct push sampling.

A direct push drilling rig will be utilized to obtain the soil and ground water samples. Approximately twenty sampling locations on-site will be performed within the buildings and require coring/drilling through the concrete slab. Where possible the off-site profiles will be conducted in the town right-of-way, otherwise permission will need to be obtained from the owners of the property where profile locations have been designated.

4.2.3.2 *Soil and Ground water Sampling via Direct Push*

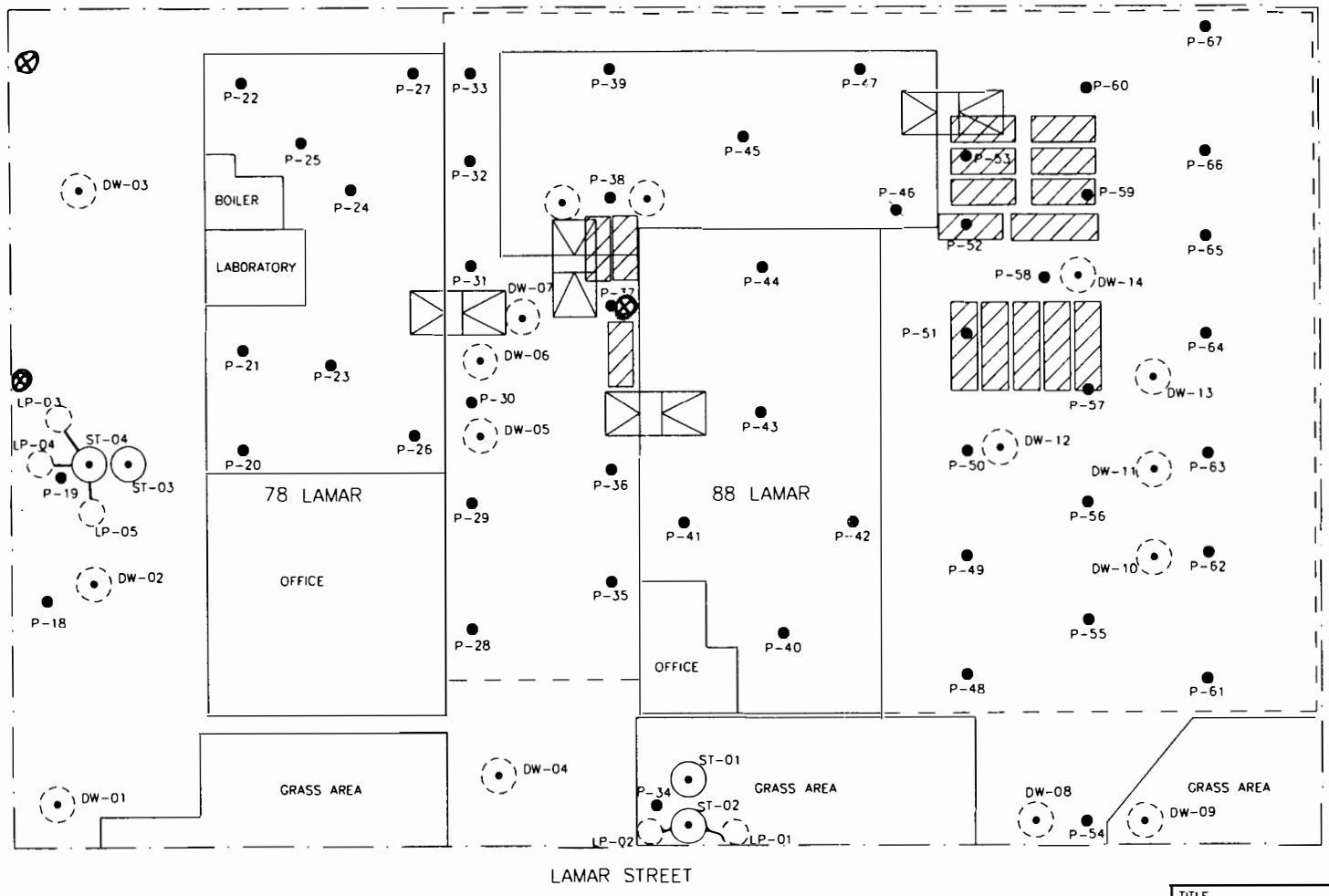
Soil Sampling

At each of the sixty locations continuous Macro Core (MC) soil sampling will be conducted until ground water is encountered. The MC sampler is approximately four feet long, therefore, based on the depth to water (approximately 17 feet), approximately five MC soil samples will be obtained at each location. Each MC soil sample will be brought to the surface and visually logged by ERM field personnel. The sample will also be screened with a PID/FID and the results will be logged into the project field book. Once the soil sample has be logged and screened, a sample will be retained for off-site laboratory analysis.

A new acetate liner will be utilized for each sampling interval to eliminate possible cross-contamination between samples. All other equipment utilized during soil sampling will be decontaminated between samples with an Alconox wash followed by a potable water rinse.

Prior to conducting the ground water-sampling task, the depth of the clay layer beneath the site will be determined. At four on-site locations continuous MC soil samples will be collected starting at approximately 75 feet below grade and continuing until the top of the clay layer is determined. ERM proposes that the four locations be spaced evenly across the site in a north south line. The information obtained on the depth to the clay layer from these four locations will be utilized to determine the depth of the bottom ground water sample at each of the other fifty on-site sampling locations.

An alternate method for determining the precise depth of the clay layer is to use a Direct Sensing Soil Conductivity probe (commonly referred to as an electrical conductivity (EC) system). The EC probe connects to the direct push rods and readings from the probe are fed to a computer for real-time display. As the probe is driven into the subsurface, readings are continuously transferred from the probe to the computer, which records changes in soil conductivity and resistivity with depth. Typically readings from an EC probe show an increase in conductivity and



TITLE

PROPOSED SAMPLING LOCATIONS PRIDE SOLVENTS & CHEMICAL CO WEST BABYLON, NY

PREPARED FOR

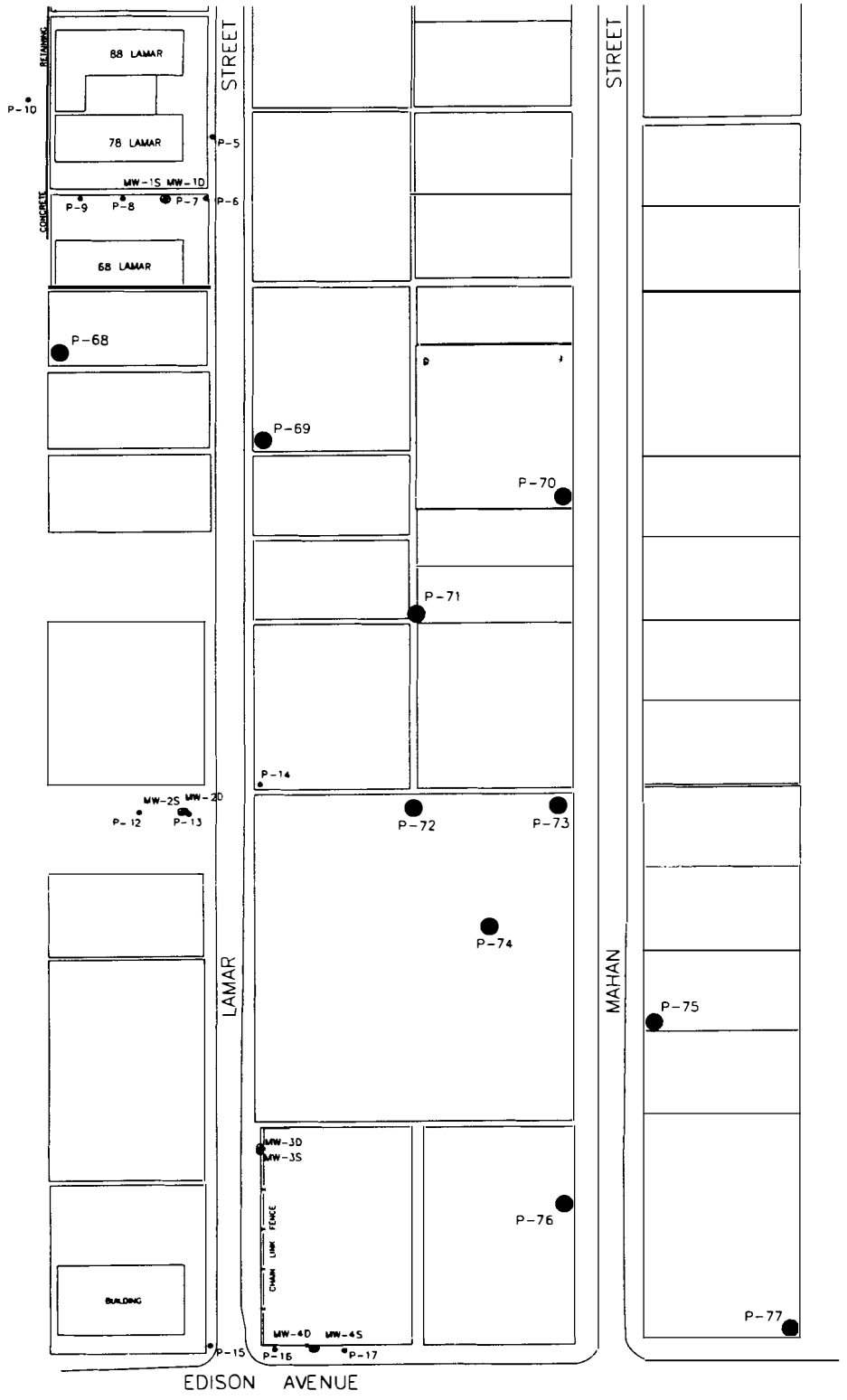
NYSDEC

Environmental Resources Management

ERM

SCALE	FIGURE
1"=40'	4-1

DRAWN:	JOB NO.:	FILE NAME:	DATE
G.D.	72702.01	72702001	07/20/01



LEGEND:

- ● PROPOSED PROFILE LOCATION
- ⊕ EXISTING PROFILE LOCATION
- ⊖ MONITORING WELL

TITLE

PROPOSED PROFILE SAMPLE LOCATIONS DOWN GRADIENT OF PRIDE SOLVENTS

PREPARED FOR

NYSDEC

Environmental Resources Management

ERM

SCALE	FIGURE
1"=200'	4-2

DRAWN	JOB NO.:	FILE NAME:	DATE
G.G.	72702	MANUAL-2	4/21/00

4.2.4 *Drywell Sampling*

Approximately fifteen stormwater drywells are present on the site. Each of the drywell covers will be removed and a grab sediment sample will be obtained from approximately two feet below the top of the sediment within the structure. The samples will be obtained with a stainless steel bucket auger or stainless steel sediment core sampler. The samples will be brought to the surface and immediately transferred to laboratory supplied bottles. The sampling equipment will be decontaminated between samples with an Alconox wash followed by a potable water rinse.

All sediment samples obtained will be sent for laboratory analysis. The analysis will consist of TCL VOCs analysis using the NYSDEC ASP Method 95-1.

4.2.5 *Septic System Sampling*

Two septic systems are present at the site. The first is located to the east of 88 Lamar Street and second system is located south of 78 Lamar Street. Previous investigations conducted at the site indicated that the system located at 88 Lamar Street contains a sanitary septic tank and two leaching pools and the system at 78 Lamar Street contains a sanitary septic tank and three leaching pools. The septic tanks for both systems are identifiable at the surface by manhole covers. The leaching pools are not visible at the surface and therefore will need to be exposed.

A backhoe will be used to uncover the leaching pools at each system. The backhoe will remove any soil overlying the leaching pool and place the soil on plastic sheeting for re-use as backfill after all sampling is conducted. The cover will then be removed from the leaching pool and set aside. Soil/sediment samples will then be obtained from each leaching pool.

Soil/sediment sampling will be performed with a stainless steel bucket auger or stainless steel sediment core sampler. Samples will be brought to the surface and immediately transferred to laboratory supplied bottles. Based on the recent inactivity at the site and therefore inactivity of the sanitary systems, it is assumed that liquids will not be present in any of the leaching pools. The sampling equipment will be decontaminated between samples with an Alconox wash followed by a potable water rinse.

Both liquid and sediment/sludge sampling will be conducted on the two septic tanks. Liquid samples will be obtained first from each tank

utilizing a pre-cleaned polyethylene disposable bailer. Sediment/sludge sampling will be performed after the liquid sampling. Sediment/sludge samples will be collected with a stainless steel bucket auger or stainless steel sediment core sampler. All samples will be brought to the surface and immediately transferred to laboratory supplied bottles. The sampling equipment will be decontaminated between samples with an Alconox wash followed by a potable water rinse.

All samples obtained from the septic system sampling will be sent for laboratory analysis. The analysis will consist of TCL VOCs analysis using the NYSDEC ASP Method 95-1.

After sampling has been conducted the area around each leaching pool will be restored. At both systems the covers to the leaching pool will be re-installed and backfilled with previously excavated soil. Final restoration around the system at 88 Lamar Street will consist of re-grading and seeding. Final restoration of the system at 78 Lamar Street will consist of grading and compacting the soil and asphalt patching the excavated areas.

Disposal of the liquid and sediment/sludge from the septic tanks may be necessary. In order to expedite sludge and liquid removal, a representative from the SCDHS will be requested to be on-site to oversee the sanitary system sampling. Based on the observations of the SCDHS representative and the results of the septic tank sampling, the need for disposal will be determined. Budgetary provision has been made for the disposal of the liquids as non-hazardous.

4.2.6 Ground Water Monitoring Well Installation

A total of ten new monitoring wells will be installed at locations to be determined after completion of prior field tasks. Six wells will be installed on-site and four wells will be installed off-site. The locations of the on-site wells will be based upon results of the soil and ground water sampling, the drywell sediment sampling and the septic sampling. The location of the off-site well locations will be based on the results of the off-site ground water sampling. All wells will be deep wells installed to the top of the Gardiners Clay. Split spoon sampling will not be conducted throughout the entire borehole. Continuous split spoon sampling will be only conducted starting at approximately 75 feet below grade in order to determine the top of the clay layer prior to setting the well.

4.2.6.1 *Well Construction*

The ten new wells will be constructed of 2-inch diameter polyvinyl chloride (PVC) well casing with 10-foot screens. Figure 4-3 presents a Typical Well Construction detail. All wells will be screened so that the bottom of the screen is just above the top of the Gardiners Clay. The well designation will be noted on the casing and locks used for all site wells will be keyed alike and keys provided to the NYSDEC.

4.2.6.2 *Monitoring Well Development*

Drilling and well installation procedures typically result in disturbance of natural bedding and hydraulic permeability of the surrounding formation. A development goal will be achieving discharge turbidity of 50 NTUs (Nephelometric Turbidity Units) or less. Stabilization (+/- 20 percent in four successive measurements) of well discharge turbidity, temperature and specific conductance measurements will be used as the completion criteria for this task.

4.2.6.3 *Monitoring Well Horizontal and Vertical Control Survey*

The horizontal location and vertical position (measuring point) of each newly installed monitoring well will be determined by a licensed land surveyor. This will enable interpolation of gathered hydrogeologic information between wells. The measuring point elevation of each well will be determined to an accuracy of 0.01 feet in order to accurately map ground water flow patterns. Vertical elevations will be determined relative to the NGVD (National Geodetic Vertical Datum).

In addition, as stated in Section 3.2.1, a property boundary survey will be conducted for 78-88 Lamar Street to determine the legal boundaries of the property.

4.2.7 *Ground Water Sampling*

4.2.7.1 *Monitoring Well Sampling*

Monitoring well sampling will be conducted at the ten new wells and the eight wells installed as part of the 2000 investigation approximately two weeks after development of the ten new wells. All wells will be purged following NYSDEC protocols and field parameters will be collected for temperature, pH, specific conductance and dissolved oxygen.

Samples will be collected using a low-flow protocol. Analysis will include TCL VOCs by NYSDEC ASP Method 95-1. Field parameters will be recorded using an inline flow cell.

4.2.8 Ground Water Elevation Monitoring

Each of the ten proposed monitoring wells and the existing eight wells will have their location and top of casing elevations determined using a common datum. This information will be incorporated into maps depicting water level elevations and flow patterns that will be prepared for each round of data collection.

Figure 4-3
Typical Monitoring Well Construction

ERM, INC.

WELL : Typical

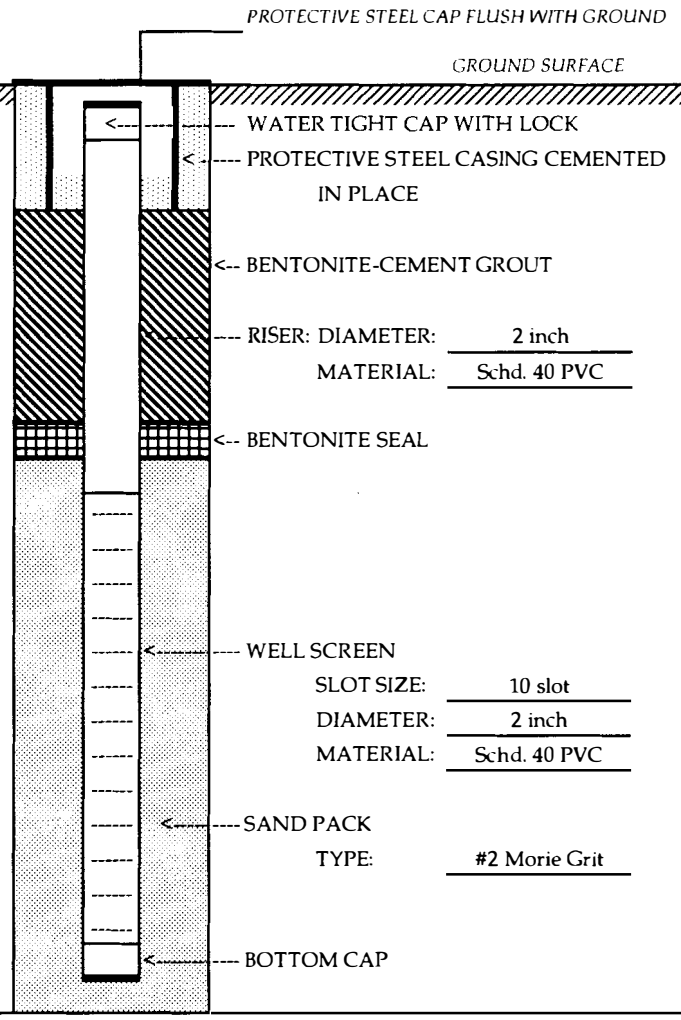
175 Froehlich Farm Blvd., Woodbury, NY 11797

MONITORING WELL CONSTRUCTION LOG

Project Name & Location	Project No.	Water Level(s) (ft below top of PVC casing)			Site Elevation Datum (feet)
Pride Solvents	**72702.00**				
Drilling Company	Foreman	Date	Time	Level (feet)	Ground Elevation (feet)
Surveyor					Top of Protective Steel Cap Elevation (feet)
Date and Time of Completion	Geologist				Top of Riser Pipe Elevation (feet)

Generalized Soil Description	*Elevation	**Depth
	0.00	0.0
	0.00	0.5
	-1.50	1.5
	-36.00	36.0
	-38.00	38.0
	-40.00	40.0
	-50.00	50.0
	-50.50	50.5

CONSTRUCTION DETAILS



BOTTOM OF BOREHOLE

REMARKS _____

* Elevation (feet) above mean sea level unless noted

** Depth in feet below ground surface

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rev. 9/96

4.3 *RI WASTE MANAGEMENT AND DISPOSAL*

The following section describes the handling and ultimate disposal of solid and liquid wastes generated during the implementation of the RI. Waste generated during the RI is expected to consist of drill cuttings, trash (boxes, paper, etc.), decontamination wash water, purge water and used protective clothing. All waste generated will be disposed of following applicable rules and regulations. Ten composite samples will be obtained from waste material and sent for laboratory characterization.

Accordingly, handling and disposal will be as follows:

- Non-contaminated trash and debris will be placed in trash bags and returned to ERM's warehouse to be disposed of by a local garbage hauler.
- Non-contaminated protective clothing will be packed in plastic bags and returned to ERM's warehouse to be disposed of by a local garbage hauler.
- Cuttings will be collected at the Hydropunch boring and well sites during installation will be placed in 55-gallon ring-top drums and stored in a designated area for later disposal based in accordance with any applicable federal and state regulation..
- Liquids generated from equipment decontamination, well purging and development will be placed in 55-gallon ring-top drums and stored in a designated area for later disposal based in accordance with any applicable federal and state regulation.
- Used protective clothing and equipment that is suspected to be contaminated with hazardous waste will be placed in plastic bags, packed in 55-gallon ring-top drums, and disposed of in accordance with any applicable federal and state regulation in addition to those referenced above by a waste subcontractor.

4.4 *SAMPLE ANALYSIS AND VALIDATION*

4.4.1 *Sample Analysis*

All samples collected during the Pride Solvent FRI/FS will be submitted to a NYSDOH Environmental Laboratory Accreditation Program (ELAP)

Contract Laboratory Program (CLP) certified laboratory meeting requirements for documentation, data reduction and reporting. An ASP Category "B" deliverables package shall be provided by the laboratory. Data summary tables will be submitted to the NYSDEC with qualifiers and comparisons to regulatory standards.

4.4.2 *Data Validation Protocols*

Data validation is the assessment of data quality with respect to method requirements and technical performance of the analytical laboratory. Analytical data packages will be examined to ensure that all required lab components are included, all QA/QC requirements were performed, and the data use restrictions are well defined.

Summary documentation regarding QA/QC results will be completed by the laboratory using NYSDEC ASP forms and will be submitted with the raw analytical data packages (NYSDEC ASP CLP deliverables).

Data validation will be performed by an independent third party validator to assess and document analytical data quality in accordance with the project data quality objectives. The validation will evaluate data for its quality and usability. This process will qualify results so that the end user of the analytical results can make decisions with consideration of the potential accuracy and precision of the data. For example, the results are acceptable as presented, qualified as estimated and flagged with a "J," or rejected and flagged with an "R."

Because the NYSDEC ASP is based on the USEPA CLP, the USEPA Region II CLP Organics Data Review guidelines and the USEPA National Functional Guidelines for Evaluating Organics Analyses, the CLP will assist in formulating standard operation procedures (SOPs) and guidelines for the data validation process. Consequently, the data will be validated according to the protocols and QC requirements of the analytical methods, the NYSDEC ASP, USEPA Region II CLP Organics Data Review (CLP/SOW OLM 03.2) SOP No. HW-6 Revision #11 (May 1996), USEPA CLP National Functional Guidelines for Organic Data Review (February 1994), and the reviewer's professional judgment. The order in which the aforementioned guidance documents and/or criteria are listed does not imply a hierarchy of reliance on a particular document. The most comprehensive reference sources will be relied upon to perform the most complete validation possible.

The data validation process will provide an informed assessment of the laboratory's performance based upon contractual requirements and

applicable analytical criteria. The report generated as a result of the data validation process will provide a base upon which the usefulness of the data can be evaluated by the end user of the analytical results.

During the review process, it will be determined whether laboratory submittals for sample results are supported by sufficient back-up data and QA/QC results to enable the reviewer to conclusively determine the quality of data. Each data package will be checked for completeness and technical adequacy of the data. Upon completion of the review, the reviewers will develop a QA/QC data validation report for each sample delivery group (SDG).

At a minimum the following items/criteria will be reviewed:

- Quantitation and detection limits;
- Sample holding times and preservation (pH and temperature);
- GC/MS tuning and performance;
- Initial calibrations;
- Continuing calibrations;
- Method, instrument and holding blanks;
- Field and trip blanks;
- Field duplicate results;
- Surrogate spike recoveries;
- Matrix spike/matrix spike duplicate/matrix spike blank results;
- Internal standard area counts and retention times;
- Data system printouts;
- GC chromatograms and mass spectra;
- Qualitative and quantitative compound identification; and
- Case narrative and deliverable compliance.

After completion of the validation, a data validation report will be prepared by the third party validator. The report will be reviewed by the ERM Quality Assurance Officer.

4.4.3 *Data Validator's Qualifications*

The person completing the data validation will have, at a minimum, the following credentials:

- A bachelors degree in chemistry or natural science with a minimum of 20 hours in chemistry; and
- One-year experience in the implementation and application of the protocol(s) used in data generation.

Successful completion of the USEPA Data Validation Training Course may be substituted for the analytical experience requirement. The validator must also have a minimum of one (1) year experience evaluating CLP data packages for contract and protocol compliance. The resume of the Quality Assurance Officer (QAO) and other key personnel will be provided, as required.

5.0 EXPOSURE ASSESSMENT

5.1 OBJECTIVES

A qualitative Health and Environmental Exposure Assessment (HEEA) for the site will be prepared based on the findings of the current investigation. The objectives of the HEEA are to identify potential exposure pathways for contaminants at the site, identify potential on-site and off-site receptors, and qualitatively evaluate potential exposures to these receptors. The HEEA will follow NYSDOH guidelines.

The HEEA will evaluate potential exposures to human and receptors. The approach for evaluating impacts to human health is described below.

5.2 METHODOLOGY

The evaluation of potential exposures to human health will consist of the following steps:

- Identification of potential exposure pathways (including identification of public and private wells 0.5 mile up gradient and 1.5 miles down gradient of the site;
- Identification of chemicals of potential concern for each pathway; and
- Qualitative evaluation of exposure pathways.

Each of these steps is described below.

Identification of Potential Exposure Pathways

In this step, current and future potential exposure pathways for chemicals at the Pride Solvents site will be identified. In order for there to be a complete exposure pathway, there must be a source of chemical(s), a transport mechanism, and a receptor.

Identification of Chemicals of Potential Concern

Chemicals of potential concern for each complete exposure pathway will be identified by comparing the maximum detected concentrations of chemicals in each of the relevant media at the site to applicable Standards,

Criteria and Guidance (SCGs). Those chemicals for which SCGs are exceeded will be further evaluated in the following step.

Qualitative Evaluation of Potential Exposure Pathways

In this step, a qualitative assessment of exposures associated with the potential chemicals of concern for each of the exposure pathways will be prepared. This step will identify site-specific factors influencing the impact of exceedences of SCGs, where appropriate.

5.3 *REPORT PREPARATION*

A final HEEA report will be prepared. The HEEA will include the findings of the evaluation of human health exposures described in this section. The HEEA will be incorporated into the RI report described above.

6.0 *FOCUSED RI REPORT*

The preparation of a comprehensive RI Report will begin at the conclusion of the field investigation. In developing the scope of the RI, it was recognized that soil and ground water investigative efforts have previously been conducted at the Pride Solvent site as well as within the industrial area surrounding the site. Accordingly, the RI Report will build upon the findings and conclusions of previous investigative efforts conducted by NYSDEC's contractors and the SCDHS. The previous findings and conclusions will be incorporated into the RI Report along with new information obtained through the performance of this RI. Previous reports prepared by others will be incorporated into the RI Report by reference as necessary. The RI Report will summarize the RI field investigations, laboratory analytical results and the Exposure Assessment (EA). The RI Report will include the following:

- Objectives of the remedial investigation;
- Site description, including the physical and environmental setting of the Pride Solvents site and study area;
- History of the Pride solvents site;
- Description of field investigation methods and activities;
- Supporting documentation (e.g., profile logs, field data forms, etc.);
- Impacts to soil;
- Description of the ground water flow;
- Nature and extent of ground water contamination (findings of the field investigation);
- Figures and tables summarizing all site related data;
- Plan views of ground water flow and the distribution of contaminants (isoconcentration contour maps);
- Contaminant fate and transport;
- Exposure Assessment; and
- Findings and conclusions.

A draft RI Report will be submitted to NYSDEC for review and comment. A meeting will then be held at NYSDEC headquarters to determine whether additional investigative activities are needed.

7.0 *FOCUSED FEASIBILITY STUDY*

Preparation of the Focuses Feasibility Study for the Pride Solvents Site is described in the following sections.

7.1 *PURPOSE*

The purpose of a Focused Feasibility Study (FFS) is to determine an appropriate remedial response for specific site conditions (sources, pathways and receptors) posing an unacceptable exposure pathways. At the Pride Solvents Site, the FS will focus on Remediation of off-site ground water. The remedial response to be selected in the FS will consist of actions, which will eliminate unacceptable exposure pathways or reduce them to levels that are protective of human health and the environment.

The FS for off-site ground water at the Pride Solvents Site will accomplish the following objectives:

- Establish remedial objectives including cleanup goals for off-site ground water relying on Applicable or Relevant and Appropriate federal and state Requirements (ARARs) and NYSDEC Standards, Criteria and Guidance (SCGs) where applicable;
- Identify response actions which can achieve the established objectives;
- Identify ARARs and SCGs that apply to the identified response actions or where they will be implemented (e.g., action and location-specific ARARs or SCGs);
- Define and screen technologies that can accomplish those response actions; and
- Assemble the appropriate technologies into remedial action alternatives and subject those alternatives to a detailed evaluation consistent with the NCP and NYSDEC TAGM on Selection of Remedial Actions at Inactive Hazardous Waste Sites (HWR-90-4030).

The FFS report will propose, based on the results of the alternative evaluation, implementation of the most cost-effective remedial action alternative, which satisfies or exceeds the remedial objectives.

7.2 *PROCEDURES*

The FFS will be developed in accordance with the requirements of 6 NYCRR Part 375-1.10 (Remedy Selection) and the National Contingency Plan (NCP). The NYSDEC Technical and Administrative Guidance Memorandum (TAGM) on Selection of Remedial Actions at Inactive Hazardous Waste Sites (May 15, 1990) will also be used to guide the development of the FFS. The FFS will be completed in five stages:

- Define Remedial Action Objectives;
- Identify and Select Representative Remedial Action Technologies;
- Develop and Evaluate Remedial Action Alternatives;
- Compare Remedial Action Alternatives; and
- Prepare FS Report.

The five stages to completion of the FFS are described in detail below.

7.2.1 *Define Remedial Response Objectives*

Remedial response objectives and criteria will be developed for off-site ground water at the Pride Solvents Site based upon the following:

- Results of the RI and the Exposure Assessment (if prepared);
- NYSDEC requirements for the selection of remedy as defined in 6 NYCRR Part 375;
- USEPA requirements of the NCP (NCP, 40 CFR 300);
- ARARs (federal) or SCGs (state); and
- Public health and environmental concerns.

The source areas, exposure pathways and receptors at the Pride Solvents Site will be identified and a list of potential applicable or relevant and appropriate requirements (SCGs) will be developed. Potential chemical, location and action specific ARARs will also be identified. The list of potential ARARs will be developed based on a review of New York State and USEPA standards, criteria and guidance (SCGs). USEPA laws and regulations will be considered to the extent that they are more stringent than those of New York State. Location and action specific SCGs will be used in the evaluation of remedial action alternatives. Chemical-specific ARARs will be used to develop chemical-specific cleanup levels for the site. Chemical-specific cleanup levels will be developed in accordance with the requirements of 6 NYCRR Part 375 and the NCP.

7.2.2 *Identify and Select Representative Remedial Action Technologies*

Once the objectives of the remedial response have been determined, remedial action technologies will be identified. The chemical and physical characterization of the site will be considered in the identification of the remedial technologies. Generally, a number of technologies are available to address off-site ground water issues at the site. The purpose of this task is to identify, describe and determine which technologies can be used to satisfy, in whole or in combination, the remedial response objectives for the site. The remedial technologies that cannot be implemented at the site will be eliminated from further consideration.

Remedial technologies will be identified through a review of New York State and USEPA guidelines, relevant literature, and through ERM's experience in developing remedial action plans for similar problems. Technologies will be identified to address both source control of substances of concern originating from the site and control of potential off-site ground water contamination. Alternative technologies and resource recovery technologies will be given particular consideration.

Exposure assessment will identify: (1) which site chemicals are substances of concern; and (2) which exposure pathways pose are unacceptable and, as a result, would require remediation. Only technologies that address the environmental media and exposure pathways, were identified as unacceptable exposure pathways, will be evaluated in the FS.

Within each technology, there may be several technology processes offering similar benefits at comparable costs. The selection of process options will be based on effectiveness and technical feasibility, however, in some cases, more than one process option may be identified.

7.2.3 *Develop and Evaluate Remedial Action Alternatives*

Individual technologies may satisfy some, but not all, of the remedial response objectives for the site. Several technologies may be combined to form a comprehensive approach that will satisfy the remedial response objectives for the site. Accordingly, the applicable remedial action technologies identified in Section 6.2.2 will be assembled into remedial action alternatives for the site. All significant site issues and pathways of migration of the substances of concern will be considered during the development of remedial action alternatives. Remedial approaches to be developed in this stage of the FFS will include alternatives in which the following is a principal element: (1) treatment to reduce toxicity, mobility or volume, including destruction, separation or in-situ methods; and (2)

containment measures to control and isolate chemicals of concern. In addition, a no action alternative will be evaluated.

Screening of the alternatives will occur after the technologies have been combined. Screening of the remedial alternatives is conducted to narrow the list of potential alternatives that will need detailed evaluation. As the alternatives are developed, each remedial alternative should be screened based on the ability to meet medium-specific remedial action objectives, implementability and short-term and long-term effectiveness. Cost will not be a screening tool during the screening process.

Detailed analysis of the alternatives will be conducted after the screening process is complete. Each alternative will be evaluated for the criteria identified in 6 NYCRR Part 375-1.10 and NCP at 40 CFR Part 300.430 (e)(9):

1. Protection of human health and the environment.
2. Compliance with SCGs.
3. Long-term effectiveness and permanence.
4. Reduction of toxicity, mobility or volume.
5. Short-term effectiveness.
6. Implementability.
7. Cost.

Protection of human health and the environment and compliance with SCGs are threshold criteria which all alternatives will be required to meet in order to be eligible for selection. Compliance with SCGs will be required unless, as stated in 6 NYCRR Part 375-1.10, "good cause exists why conformity should be dispensed with." The criteria to be used in the FFS for determining the need to comply with SCGs will be those discussed in 6 NYCRR Part 375-1.10 and in the NCP at 40 CFR 300.430(f)(1)(ii)(C).

Long and short term effectiveness, reduction of toxicity, mobility or volume and implementability are primary balancing criteria that will be used to compare the alternatives. Community acceptance, an additional criteria identified in 6 NYCRR Part 375-1.10, will be addressed by the NYSDEC based on comments received during public review of the NYSDEC Proposed Remedial Action Plan (PRAP). The PRAP is to be prepared by the NYSDEC based on the information contained in the FFS.

An analysis of the alternatives will be performed to provide the rationale for the remedy selection process. The detailed evaluation will include at a minimum the following criteria:

- The component treatment and disposal technologies that comprise a specific alternative, as well as any permanent facilities required, will be described.
- Specific engineering considerations required to implement each alternative (design efforts or additional information needed will be defined).
- The degree to which each alternative would permanently and significantly reduce the volume, toxicity or mobility of the substances identified in the exposure assessment as chemicals of concern will be analyzed.
- The evaluation will include an analysis of whether waste biodegradation or in-situ destruction or other advanced, innovative or alternative technologies would be appropriate to reliably minimize present or future threats, if any, to public health or welfare of the environment.
- Each alternative will be compared to the remedial response objectives in order to determine its ability to adequately protect human health and the environment.
- Each alternative will be analyzed for compliance with the SCGs identified during the development of remedial objectives.
- Environmental impacts and proposed methods for mitigating any adverse effects, as well as the costs of such mitigation efforts will be defined.
- Operation, maintenance and monitoring requirements of the remedial measures will be defined.
- Off-site disposal and transportation needs will be defined.
- The evaluation will include a discussion of health and safety considerations during remedial implementation including requirements for safety plans. This section will address the short-term health and safety considerations for the on-site workers as well as nearby residents, if any.
- A description of how the alternative may be divided into functional components to allow for a possible phased (i.e., operable unit) approach to implementation will be included.

The technical requirements for permits that might be needed for each alternative, if any, will be identified in accordance with 6 NYCRR Part 375-1.7.

A detailed breakdown of the capital, operation and maintenance costs will be presented in an appendix to the FFS report. These costs will be summarized in the text of the FFS. The present worth cost of each alternative should be calculated using a 5 percent discount rate. For each alternative, all engineering equipment shall be sized and process diagrams and schematics will be provided. Engineering calculations shall be provided in the appendix of the FS report to support the process data.

7.2.4 *Compare Remedial Action Alternatives*

Upon completion of the alternative assessment, a comparison of the remedial alternatives will be performed. This comparison will include determining the relative importance of both the cost and non-cost criteria including the potential concerns related to feasibility and effectiveness. This section of the FFS will include a table that summarizes the analysis of alternatives. The table will describe, for each alternative evaluated, the following: (1) short and long term effectiveness; (2) the ability to reduce the toxicity, mobility or volume of the substances of concern; (3) implementability; (4) cost; (5) compliance with SCGSs; and (6) the overall protection each alternative offers for human health and the environment. This information will also be used to determine the ability of each alternative to address the remedial response objectives. The alternatives will be compared in the FS report but will not be ranked. A preferred Alternative will not be chosen.

7.2.5 *Focused Feasibility Study Report*

Following completion of the FFS, a draft FFS Report will be submitted to NYSDEC for review and approval. The FFS Report will contain an evaluation of remedial technologies. The FFS Report will be developed in accordance with the guidelines presented in the NYSDEC TAGM "Selection of Remedial Actions at Inactive Hazardous Waste Sites." (HWR-90-4030; 15 May 1989) and in the Interim Final USEPA guidance document "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (EPA/540/G-89/004; October 1988). The FFS report will be prepared, signed and stamped by a Professional Engineer who is licensed and registered in New York State.

8.0 SCHEDULE

The schedule for the Pride Solvents Site RI/FS is shown in Figure 8-1.

Figure 8-1
Pride Solvents Project Schedule

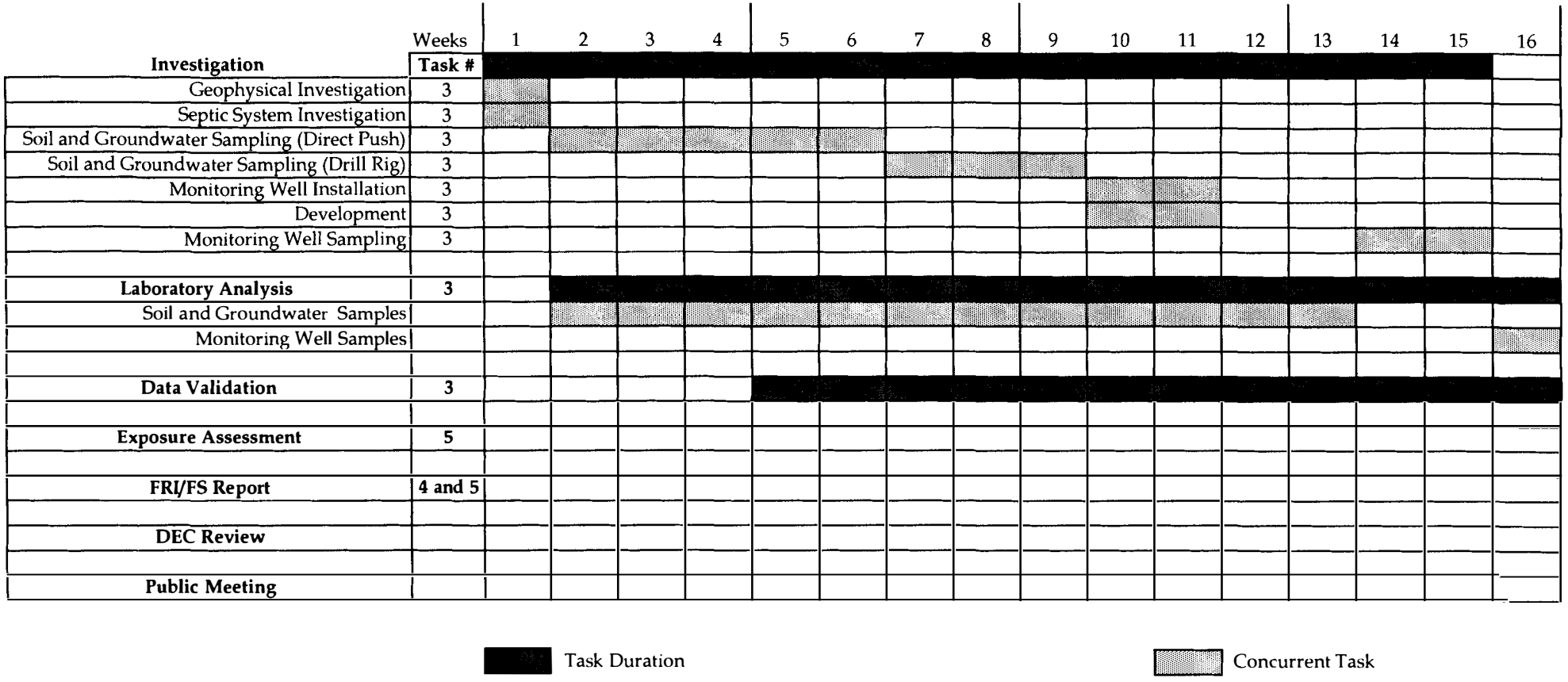
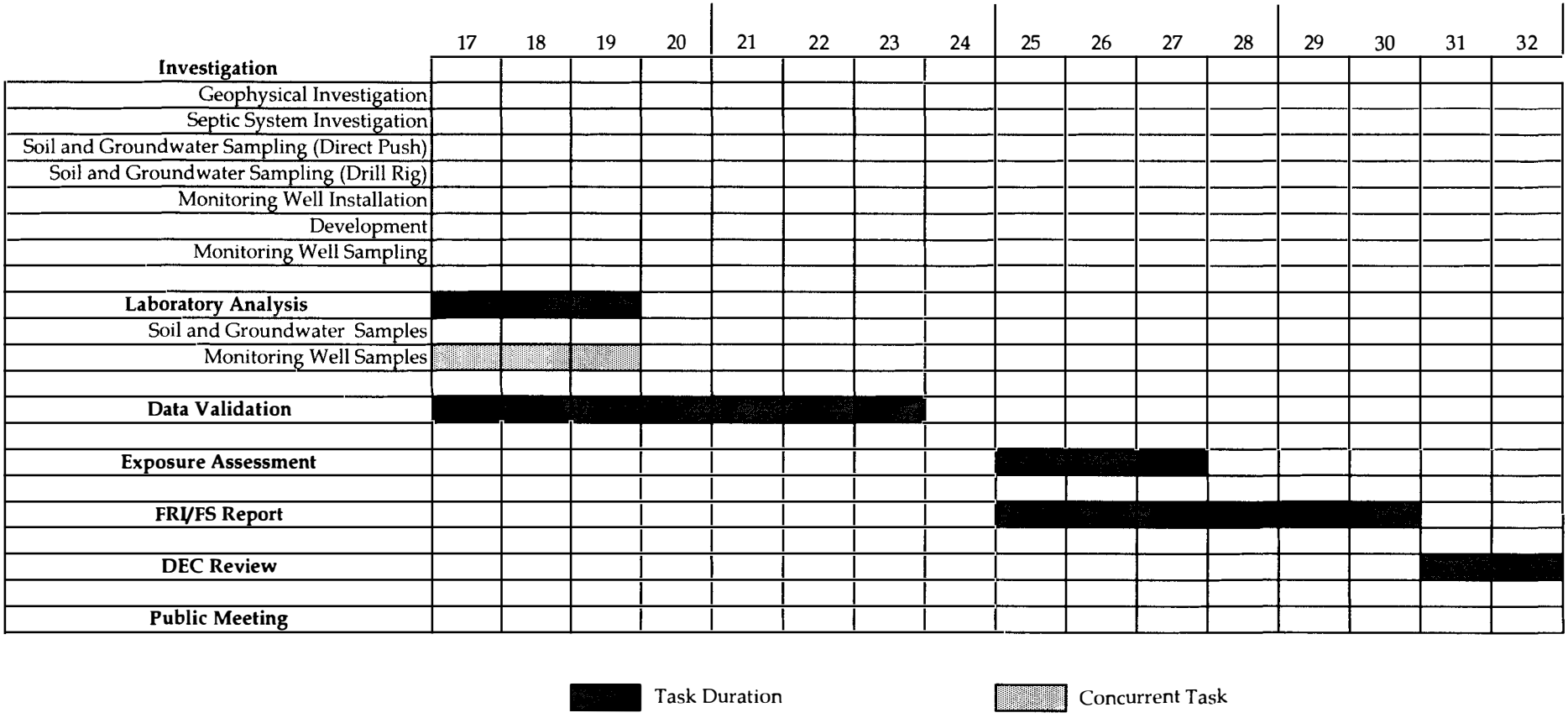


Figure 8-1
Pride Solvents Project Schedule



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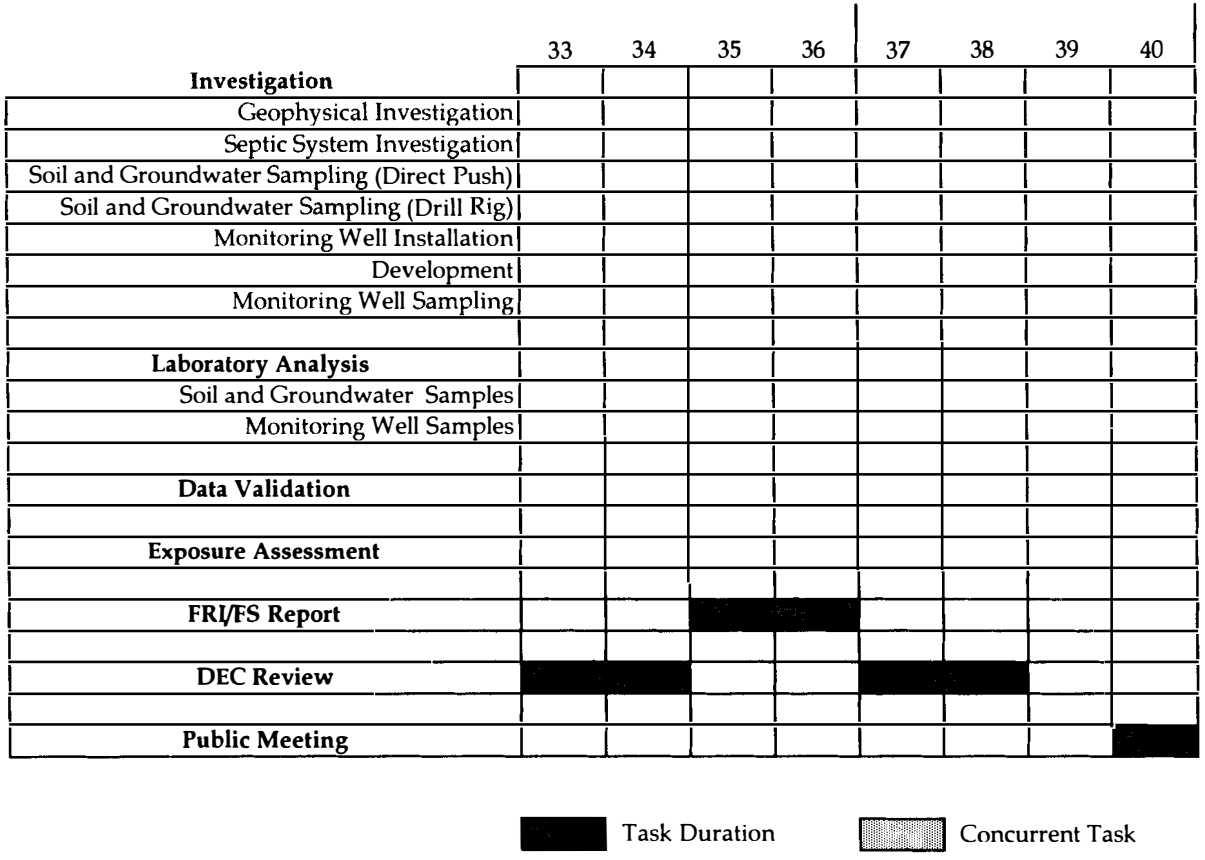
Pride Solvents Project Schedule



9.0 *PROJECTED BUDGET*

The RI/FS budget, including subcontractor and equipment costs is shown in Appendix A.