

US EPA ARCHIVE DOCUMENT

Worcester Company
1 Greystone Ave
North Providence

Greystone Motors
129 Waterman Ave
N. Prov

Rout 44 Self Storage
61 Putnam Pike
Johnston

Mehan Construction
79 Putnam Ave
Johnston

Evans Plating
50 Waterman Ave
N. Prov

Cumberland Farms
2064 Smith St
N. Prov

National Grid
521 George Waterman Rd.
Johnston

Town Asphalt/Auto Fluff
100 Allendale Ave.
Johnston

Tanury Plating
100 Railroad Ave
Johnston

Ed's Auto Parts
83 Railroad Ave
Johnston

Pat's Auto Sales
84 Railroad Ave.
Johnston

Narragansett Bay Commission Interceptor
Greenville, Lyman, Newman, Dyerville
Avenues
Johnston

WANP, LLC
4 Warren Avenue
N. Prov

Future Finishing Technologies
178 George Waterman Rd.
Johnston

C. Pezza & Sons, Inc.
100 Irons Ave.
Johnston

National Grid
Killingly St.
Johnston

Theta Realty
184 Woonasquatucket Ave
N. Prov

Trade Castings
258 Woonasquatucket Ave
N. Prov.





TABLE 2. ANALYTICAL RESULTS, GEOPROBE GROUNDWATER SAMPLES
Pezza Site - Johnston, RI
December , 2002

Date Sampled:		12/4/02	12/4/02	12/4/02	12/4/02	12/4/02	12/4/02	12/4/02	12/4/02	12/4/02	12/4/02	12/4/02	12/4/02	Groundwater Objectives (GB)
Boring Location:		B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-11	B-13	B-14	B-15	
Groundwater Depth:		14 - 18 ft	24 - 28 ft	14 - 18 ft	10 - 14 ft	9 - 13 ft	14 - 18 ft	14 - 18 ft	14 - 18 ft	14 - 18	14 - 18 ft	14 - 18	14 - 18	
Detected VOCs														
MTBE	mg/l	ND	ND	0.0053	ND	ND	ND	ND	ND	ND	10	ND	ND	5
Ethylbenzene	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.180	1.6
Naphthalene	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.130	NSA
n-Propylebenzene	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.059	NSA
Toluene	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.310	1.7
1,2,4-Trimethylbenzene	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.790	NSA
1,3,5-Trimethylbenzene	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.200	NSA
m,o,p-Xylene	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.760	NSA

Notes:

- Only analytes detected in at least one sample have been presented.

ND - Not detected above method detection limit.

NA - Not analyzed for this laboratory parameter.

VOCs - Volatile organic compounds (EPA Method 8260)

NSA - No standard available in RI's Remediation Regulations.

mg/l - milligrams per liter

10 indicates detected concentration exceeds RIDEM's GB Groundwater Objectives.

C. Pezza + Sons
Site

Table 4 Groundwater Analytical Results Plat 14, Lot 516 Smith Street North Providence, Rhode Island							
Well ID	Date	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	MTBE
MW-1	05/20/2002	<.5	<.5	<.5	<.5	<.5	<.5
MW-2	05/20/2002	<.5	<.5	<.5	<.5	<.5	<.5
MW-3	05/20/2002	1	<.5	<.5	7	62	1
RIDEM GB Standards		140	1,700	1,600	NE	NE	5,000

Notes:

- 1) All results reported in $\mu\text{g/l}$ = micrograms per liter
- 2) Monitor well samples analyzed via EPA Method 8260M.
- 3) This table summarizes BTEX compounds, Naphthalene & MTBE only. For a complete listing of analytes refer to the laboratory report.

Cumberland Farms
adjacent to CMRP

Table 5 Groundwater Analytical Results for Polynuclear Aromatic Hydrocarbons Plat 14, Lot 516 Smith Street, North Providence, Rhode Island								
MW No. Date	PAH Compounds							
	Acenaphthene	Acenaphthylene	Anthracene	Benzo(A)Anthracene	Benzo(A)Pyrene	Benzo(B)Fluoranthene	Benzo(K)Fluoranthene	Benzo(G,H,I)Perylene
MW-1								
05/20/2002	<10	<10	<10	<10	<10	<10	<10	<10
MW-2								
05/20/2002	<10	<10	<10	<10	<10	<10	<10	<10
MW-3								
05/20/2002	<10	<10	<10	<10	<10	<10	<10	<10

MW No. Date	PAH Compounds Continued								
	Chrysene	Dibenzo(A,H)Anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-CD)Pyrene	Naphthalene	2-Methyl Naphthalene	Phenanthrene	Pyrene
MW-1									
05/20/2002	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-2									
05/20/2002	<10	<10	<10	<10	<10	<10	<10	<10	<10
MW-3									
05/20/2002	<10	<10	23	<10	<10	18	<10	33	20

All units in ug/l: micrograms per liter

Analysis via EPA Method 8270

No criteria has been established for PAHs in a GB designated area

Indeno(1,2,3-cd)pyrene	0.9	7.8	NE	ND	NT	NT	NT
Phenanthrene	40	10,000	NE	ND	NT	NT	NT
Pyrene	13	10,000	NE	ND	NT	NT	NT
Metals (ppm)							
Antimony	10	820	NE	ND	NT	NT	NT
Arsenic	7.0	7.0	NE	214	NT	NT	NT
Beryllium	0.4	1.3	NE	ND	NT	NT	NT
Cadmium	39	1,000	NE	ND	NT	NT	NT
Chromium	390	10,000	NE	190	NT	NT	NT
Copper	3,100	10,000	NE	113	NT	NT	NT
Lead	150	500	NE	192	NT	NT	NT
Mercury	23	610	NE	0.32	NT	NT	NT
Nickel	1,000	10,000	NE	ND	NT	NT	NT
Selenium	390	10,000	NE	ND	NT	NT	NT
Silver	200	10,000	NE	ND	NT	NT	NT
Thallium	5.5	140	NE	ND	NT	NT	NT
Zinc	6,000	10,000	NE	267	NT	NT	NT

Notes:

Industrial/Commercial Direct Exposure Criteria (I/CDEC) and the GB Leachability Criteria are from "Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases"

ND - Not detected

NT - Not Tested

NE - None established

All results are in ppm

Table 4 - Summary of Groundwater Analytical Results

Parameter	GB Groundwater Objective	JW-1	JW-2	JW-3	SB-1
VOCs (ug/L)					
MTBE	40	1.4	ND	ND	ND
Benzene	140	ND	ND	ND	0.5
Toluene	1,700	ND	ND	ND	1.1
TPH	NE	ND	ND	ND	NT
Pesticides	---	NT	NT	NT	ND
PCBs	---	NT	NT	NT	ND
Total Cyanides	---	NT	NT	NT	ND
Total Phenols	---	NT	NT	NT	ND
SVOCs (ug/L)					
Naphthalene	NE	ND	ND	ND	3.3
Acenaphthene	NE	ND	ND	ND	0.3
Diethylphthalate	NE	NT	NT	NT	2.9
Phenanthrene	NE	ND	ND	ND	0.9
Metals (mg/L)					
Antimony	NE	NT	NT	NT	ND
Arsenic	NE	ND	0.0060	ND	0.152
Beryllium	NE	NT	NT	NT	0.005
Barium	NE	0.261	0.0622	0.126	NT
Cadmium	NE	ND	ND	ND	ND
Chromium	NE	ND	ND	ND	0.248
Copper	NE	NT	NT	NT	0.303
Lead	NE	0.0093	ND	ND	3.94
Mercury	NE	ND	ND	ND	0.002

Route 44
Self Storage
Putnam Pike
Johnston

Table 4 – Summary of Groundwater Analytical Results

Parameter	GB Groundwater Objective	JW-1	JW-2	JW-3	JW-4	JW-5	JW-6	SB-1
VOCs (ug/L)								
MTBE	40	1.4	ND	ND	ND	ND	ND	ND
Benzene	140	ND	ND	ND	ND	ND	ND	0.5
Tolunene	1,700	ND	ND	ND	ND	ND	ND	1.1
Tetrachloroethylene	150	ND	ND	ND	ND	ND	1.7	ND
TPH	NE	ND	ND	ND	ND	ND	ND	NT
Pesticides	---	NT	NT	NT	NT	NT	NT	ND
PCBs	---	NT	NT	NT	NT	NT	NT	ND
Total Cyanides	---	NT	NT	NT	NT	NT	NT	ND
Total Phenols	---	NT	NT	NT	NT	NT	NT	ND
SVOCs (ug/L)								
Naphthalene	NE	ND	ND	ND	NT	NT	NT	3.3
Acenaphthene	NE	ND	ND	ND	NT	NT	NT	0.3
Diethylphthalate	NE	NT	NT	NT	NT	NT	NT	2.9
Phenanthrene	NE	ND	ND	ND	NT	NT	NT	0.9
Metals (mg/L)								
Antimony	NE	NT	NT	NT	NT	NT	NT	ND
Arsenic	NE	ND	0.0060	ND	NT	NT	NT	0.152
Beryllium	NE	NT	NT	NT	NT	NT	NT	0.005
Barium	NE	0.261	0.0622	0.126	NT	NT	NT	NT
Cadmium	NE	ND	ND	ND	NT	NT	NT	ND
Chromium	NE	ND	ND	ND	NT	NT	NT	0.248
Copper	NE	NT	NT	NT	NT	NT	NT	0.303
Lead	NE	0.0093	ND	ND	NT	NT	NT	3.94
Mercury	NE	ND	ND	ND	NT	NT	NT	0.002
Nickel	NE	NT	NT	NT	NT	NT	NT	0.0873
Selenium	NE	ND	ND	ND	NT	NT	NT	ND
Silver	NE	ND	ND	ND	NT	NT	NT	ND
Thallium	NE	NT	NT	NT	NT	NT	NT	ND
Zinc	NE	NT	NT	NT	NT	NT	NT	2.9

Notes:

GB Groundwater Objectives from "Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases"

ND – Not detected

NT – Not Tested

NE – None established

VOC results are in ug/L, Metals results are in mg/L

Table 2
LABORATORY TESTING - GROUNDWATER SAMPLES

RIDEM Remediation Regulations - GB Criteria										
GROUNDWATER	TABLE 4	TABLE 5	GZMW1A	MW1	MW-1	GZMW2C	MW-2	GZMW3D	MW3	MW-3
OBJECTIVES	GB GW	GB GW			historical		historical			historical
	Grndwater	UP CONC	sampld:	sampld:	sampld:	sampld:	sampld:	sampld:	sampld:	sampld:
	Objective	LIMITS	04/23/02	04/23/02	08/20/1999	04/23/02	08/20/1999	04/23/02	04/23/02	08/20/1999
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Petroleum Hydrocarbons (TPH)	NO STD	30,000	21	ND	---	ND	---	ND	ND	---
Volatile Organic Compounds										
Acetone	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	0.140	18	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Bromochoromethane	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Butanone (2-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Butylbenzene (n-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Butylbenzene (tert-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Butylbenzene (sec-)	NO STD	10,000	0.0024	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	0.070	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	3.200	56	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	NO STD	10,000	ND	ND	ND	0.0041	ND	ND	ND	ND
Chloroform	NO STD	10,000	ND	ND	0.002	0.0011	ND	0.0035	0.0011	0.0012
Chloromomethane	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Chlorotoluene (2-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Chlorotoluene (4-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane (1,2-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomchloromethane	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomchloropropane(DBCP)	0.002	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorobenzene (1,2-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorobenzene (1,3-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorobenzene (1,4-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Dichloroethane (1,1-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Dichloroethane (1,2-)	0.110	670	ND	ND	ND	ND	ND	ND	ND	ND
Dichloroethylene (1,1-)	0.007	23	ND	ND	ND	ND	ND	ND	ND	ND
Dichloroethylene (cis-1,2-)	2.400	69	ND	ND	ND	ND	ND	ND	ND	0.001
Dichloroethylene (trans-1,2-)	2.800	79	ND	ND	ND	ND	ND	ND	ND	ND
Dichloromethane	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Dichloropropane (1,2-)	3.000	140	ND	ND	ND	ND	ND	ND	ND	ND
Dichloropropane (1,3-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Dichloropropane (2,2-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Dichoropropene (1,1-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Dichoropropene (cis & trans-1,3-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Diethylether	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	1.600	16	0.0036	ND	ND	ND	ND	ND	ND	ND
Ethylene dibromide (EDB)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Hexanone (2-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	NO STD	10,000	0.0022	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene (1,4-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Isopropyltoluene (p-)	NO STD	10,000	0.007	ND	ND	ND	ND	ND	ND	ND
Methyl tertiary butyl ether (MTBE)	5.000	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	NO STD	10,000	0.0054	ND	ND	ND	ND	ND	ND	ND
Pentanone (4-Methyl-2-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Propylbenzene (n-)	NO STD	10,000	0.004	ND	ND	ND	ND	ND	ND	ND
Styrene	2.200	50	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene (ethene)	0.150	NO STD	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethane (1,1,1,2-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethane,1,1,2,2	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachlorofluoromethane	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Tetrahydrofuran	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	1.700	21	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorobenzene (1,2,4-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorobenzene (1,2,3-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethane (1,1,1-)	3.100	68	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethane (1,1,2-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethylene (TCE)	0.540	87	ND	ND	ND	ND	0.005	0.0022	0.0061	0.019
Trichloropropane (1,2,3-)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Trimethylbenzene (1,2,4-)	NO STD	10,000	0.033	ND	ND	ND	ND	ND	ND	ND
Trimethylbenzene (1,3,5-)	NO STD	10,000	0.010	ND	ND	ND	ND	ND	ND	ND
Trihalomethanes (Chloroform)	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	NO STD	10,000	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (Total o, m & p))	NO STD	10,000	0.012	ND	ND	ND	ND	ND	ND	ND
	Aggregate VOC concentration:		0.0799	0.000	0.002	0.0052	0.0050	0.0057	0.0072	0.0212
Notes:										
1. Data shown in bold represents analyte concentrations above the GB Groundwater Objective.										
2. Data shown as <u>underlined</u> represents analyte concentrations above the GB Upper Concentration Limits.										

Table 2
EVANS PLATING
LABORATORY TESTING - GROUNDWATER SAMPLES

RIDEM Remediation Regulations - GB Criteria											
GROUNDWATER	TABLE 3	TABLE 4	TABLE 5	GZMW1A	MW1	MW-1	GZMW2C	MW-2	GZMW3D	MW3	MW3
OBJECTIVES	GA GW	GB GW	GB GW			historical		historical			historical
	Grndwater	Grndwater	UP CONC	sampld:	sampld:	sampld:	sampld:	sampld:	sampld:	sampld:	sampld:
	Objective	Objective	LIMITS	04/23/02	04/23/02	08/20/1999	04/23/02	08/20/1999	04/23/02	04/23/02	08/20/1999
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l*	mg/l	mg/l
Metals - PP13 & Cyanide											
Antimony	0.006	NO STD	10,000	ND	ND	---	ND	---	ND	ND	---
Arsenic	0.050	NO STD	10,000	0.0135	ND	ND	ND	0.0067	ND	ND	0.0200
Barium	2.000	NO STD	10,000	---	---	ND	---	0.091	---	---	0.010
Beryllium	0.004	NO STD	10,000	ND	ND	---	ND	---	ND	ND	---
Cadmium	0.005	NO STD	10,000	0.500	0.271	0.035	0.032	0.150	0.026	0.025	0.003
Chromium	0.100	NO STD	10,000	0.0489	0.0093	---	0.0712	---	0.0125	0.0228	---
Copper	NO STD	NO STD	10,000	0.120	0.918	0.188	0.118	ND	ND	0.0523	ND
Lead	0.015	NO STD	10,000	0.0777	0.0132	0.005	0.0703	ND	ND	ND	ND
Mercury	0.002	NO STD	10,000	ND	ND	---	ND	---	ND	ND	---
Nickel	0.100	NO STD	10,000	6.170	7.52	1.610	0.246	4.650	0.951	56.500	42.700
Selenium	0.050	NO STD	10,000	ND	ND	0.011	ND	ND	ND	ND	ND
Silver	NO STD	NO STD	10,000	0.0520	ND	0.008	ND	ND	ND	ND	ND
Thallium	0.002	NO STD	10,000	ND	ND	---	ND	---	ND	ND	---
Zinc	NO STD	NO STD	10,000	4.64	0.550	0.175	0.120	0.045	0.114	1.180	0.569
Cyanide	0.200	NO STD	10,000	0.25	ND	0.050	0.02	2.580	ND	0.35	0.020
Notes:											
1. Data shown in bold represents analyte concentrations above the GA Groundwater Objective.											

CERTIFICATE OF ANALYSIS

Geisser Engineering

DATE RECEIVED: 01/03/92

DATE REPORTED: 01/23/92

INVOICE #: E1047

P.O. #:

PARAMETER	GROUNDWATER (MW#1 & MW#2)	SOIL (MW#1, MW#2 & B1)
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Total Petroleum Hydrocarbons	<1.0 mg/l	<34.1 mg/kg*
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Metals (Soluble):

Arsenic	<0.005 mg/l	----
Barium	<0.20 "	----
Cadmium	<0.01 "	----
Chromium	<0.03 "	----
Lead	<0.04 "	----
Mercury	<0.0005 "	----
Selenium	<0.005 "	----
Silver	<0.02 "	----

Characteristic of E.P. Toxicity:

Arsenic	----	<0.005 mg/l
Barium	----	<0.20 "
Cadmium	----	<0.01 "
Chromium	----	<0.03 "
Lead	----	<0.04 "
Mercury	----	<0.0005 "
Selenium	----	<0.005 "
Silver	----	<0.02 "

Polychlorinated Biphenyls

(Method #608/8080):

Aroclor-1016	<1.0 µg/l	<0.1 mg/kg*
Aroclor-1221	<1.0 "	<0.1 "
Aroclor-1232	<1.0 "	<0.1 "
Aroclor-1242	<1.0 "	<0.1 "
Aroclor-1248	<1.0 "	<0.1 "
Aroclor-1254	<1.0 "	<0.1 "
Aroclor-1260	<1.0 "	<0.1 "

Volatile Organic Compounds

1,1,1-trichloroethane	9 µg/l	ND
tetrachloroethylene	58 "	ND
Detection Limits:	1 µg/l	1.0 mg/kg

*Calculated on dry weight basis.

Note: A list of volatile organic compounds tested is attached.

RI ANALYTICAL LABORATORIES, INC.

Page 2

Tanury Plating

100 Railroad Ave.

Johnston

Table 2 Groundwater Analytical Summary - March 18, June 5 and June 7, 1996
Volatile Organic Compounds via EPA Method 8260
Results in µg/l

Well ID	Date	DCE	TCE	PCE	MEK
LE-2S	6/5/96	<5	<5	44	<5
LE-3S	6/5/96	<5	<5	<5	5
LE-1D	3/18/96	24	2,300	8	<5
	6/7/96	43	2,900	9	<5
LE-2D	6/7/96	<5	<5	<5	27
LE-3D	6/7/96	<5	<5	<5	<5
GQRO-LEL*	---	69,000	87,000	NA	NA
GQRO-PEL**	---	2,400	540	150	NA

* = Groundwater Quality Remediation Objective per RIDEM Policy Memo 95-02 (10% LEL Method)

** = Groundwater Quality Remediation Objective per RIDEM Policy Memo 95-02 (PEL Method)

DCE = cis-1,2-Dichloroethene

TCE = Trichloroethene

PCE = Tetrachloroethene (perchloroethene)

MEK = Methyl ethyl ketone

NA = Not Applicable*

(Note: Acetone and/or methylene chloride were also reported in site wells, at concentrations of 12 µg/l or less)

7.0 SLUG TEST RESULTS

On July 9, 1996, several slug tests were performed on two of the deep monitor wells (LE-1D and LE-3D) installed during these investigations. No testing was performed on well LE-2D due to the substantial presence of silt within the well on the date of testing. The purpose of slug testing was to determine an appropriate value of hydraulic conductivity to be used in transport velocity calculations. Each test was performed by inserting a slug into the well, allowing the groundwater level to equilibrate, removing the slug, and measuring the rate of recharge of the groundwater level

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

178 George Waterman Road
Johnston, Rhode Island

Future Finishing
Technologies

Sample Identification Applicable Groundwater Objective Date Sampled	MW-1			MW-2			MW-3B			MW-4			MW-5			MW-6		MW-7		MW-8		MW-9	RIDEM	
	GA			GA			GA			GA			GA			GA		GB		GA		GA	Groundwater Objectives	
	9/8/2000	6/22/2005	4/11/2006	9/8/2000	6/22/2005	4/11/2006	9/8/2000	6/22/2005	4/11/2006	9/8/2000	6/22/2005	4/11/2006	9/8/2000	6/22/2005	4/11/2006	7/25/2005	4/11/2006	7/25/2005	4/11/2006	7/25/2005	4/11/2006	4/11/2006	GA Objectives	GB Objectives
VOLATILE ORGANIC COMPOUNDS by EPA Method 8260B (ug/L)																								
Vinyl Chloride	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 25	< 25	< 1	< 0.5	< 2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 25	< 0.5	2	NS
Methyl tert-butyl Ether (MTBE)	1.06	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 25	< 25	< 1	< 0.5	< 2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 25	< 0.5	40	5,000
1,1-Dichloroethene	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 25	< 25	< 1	< 0.5	< 2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 25	< 0.5	7	7
cis-1,2-Dichloroethene	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 25	< 25	< 1	< 0.5	< 2.5	2	0.8	< 0.5	< 0.5	< 10	< 25	< 0.5	70	2,400
Benzene	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 25	< 25	< 1	< 0.5	< 2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 25	< 0.5	5	140
Trichloroethene	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	3.14	< 25	< 25	1.87	< 0.5	< 2.5	4	2	< 0.5	< 0.5	< 10	< 25	0.9	5	540
Toluene	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 25	< 25	< 1	< 0.5	< 2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 25	< 0.5	1,000	1,700
Tetrachloroethene	< 1	< 0.5	< 0.5	63.6	1	< 0.5	< 1	< 0.5	< 0.5	2,130	2,400	2,100	1,090	47	110	13	4	9	2	990	1,700	2	5	150
Chlorobenzene	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	77	< 0.5	< 0.5	< 1	< 25	< 25	< 1	< 0.5	< 2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 25	< 0.5	100	3,200
Ethylbenzene	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 0.5	< 0.5	< 1	< 25	< 25	< 1	< 0.5	< 2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 10	< 25	< 0.5	700	1,600
Other VOC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--
METALS by EPA Methods 6010/7470A (mg/L)																								
Antimony	< 0.1	--	--	< 0.1	--	< 0.06	< 0.1	--	--	< 0.1	--	< 0.06	< 0.1	--	< 0.06	< 0.06	--	< 0.06	--	< 0.06	< 0.06	--	0.006	NS
Arsenic	< 0.05	--	--	< 0.05	--	< 0.03	< 0.05	--	--	< 0.05	--	< 0.03	< 0.05	--	< 0.03	< 0.01	--	< 0.01	--	< 0.01	< 0.03	--	NS	NS
Beryllium	< 0.001	--	--	< 0.004	--	< 0.004	< 0.001	--	--	< 0.001	--	< 0.004	< 0.001	--	< 0.004	< 0.004	--	< 0.004	--	< 0.004	< 0.004	--	0.004	NS
Cadmium	< 0.005	--	--	< 0.005	--	< 0.004	< 0.005	--	--	< 0.005	--	< 0.004	< 0.005	--	< 0.004	< 0.005	--	< 0.005	--	< 0.005	< 0.004	--	0.005	NS
Chromium	< 0.05	--	--	0.05	--	< 0.01	< 0.05	--	--	< 0.05	--	< 0.01	< 0.05	--	< 0.01	< 0.01	--	< 0.01	--	< 0.01	< 0.01	--	0.1	NS
Copper	< 0.02	--	--	0.06	--	< 0.025	< 0.02	--	--	< 0.02	--	< 0.025	< 0.02	--	< 0.025	< 0.025	--	< 0.025	--	< 0.025	< 0.025	--	NS	NS
Lead	< 0.02	--	--	0.07	--	< 0.005	< 0.02	--	--	< 0.02	--	< 0.005	< 0.02	--	< 0.005	< 0.005	--	< 0.005	--	< 0.005	< 0.005	--	0.015	NS
Mercury	< 0.0005	--	--	< 0.0005	--	< 0.0002	< 0.0005	--	--	< 0.0005	--	< 0.0002	< 0.0005	--	< 0.0002	< 0.0002	--	< 0.0002	--	< 0.0002	< 0.0002	--	0.002	NS
Nickel	< 0.04	--	--	0.05	--	< 0.04	< 0.04	--	--	0.65	--	0.5	0.32	--	0.11	< 0.04	--	< 0.04	--	< 0.04	< 0.04	--	0.1	NS
Selenium	< 0.05	--	--	< 0.05	--	< 0.05	< 0.05	--	--	< 0.05	--	< 0.05	< 0.05	--	< 0.05	< 0.05	--	< 0.05	--	< 0.05	< 0.05	--	0.05	NS
Silver	< 0.01	--	--	< 0.01	--	< 0.007	< 0.01	--	--	< 0.01	--	< 0.007	< 0.01	--	< 0.007	< 0.007	--	< 0.007	--	< 0.007	< 0.007	--	NS	NS
Thallium	< 0.1	--	--	< 0.1	--	< 0.02	< 0.1	--	--	< 0.1	--	< 0.02	< 0.1	--	< 0.02	< 0.02	--	< 0.02	--	< 0.02	< 0.02	--	0.002	NS
Zinc	0.08	--	--	0.29	--	< 0.2	0.05	--	--	0.06	--	< 0.2	0.07	--	< 0.2	< 0.2	--	< 0.2	--	< 0.2	< 0.2	--	NS	NS
CYANIDE (mg/L)																								
Total Cyanide	< 0.05	--	--	< 0.05	--	--	< 0.05	--	--	< 0.05	--	--	< 0.05	--	--	--	--	--	--	--	--	--	0.2	NS
NOTES: mg/L = milligrams per liter. ug/L = micrograms per liter. -- = Not analyzed. NS = No standard promulgated. ND = Not detected above the laboratory reporting limit BOLD concentrations exceed the applicable RIDEM GA or GB Groundwater Objectives																								

Table 7
Groundwater Analytical Results
February 19, 2002
One Greystone Avenue
North Providence, Rhode Island

Sample / Date	Concentration			RIDEM Method 1 Objective	RIDEM GB Groundwater UCL
	MW-1	MW-2	MW-3		
Analyte	2/19/2002	2/19/2002	2/19/2002		
Mercury by Cold Vapor by SW-846 7470(Dissolved) (mg/L):			NA		
Mercury	<0.0002	<0.0002		NE	NE
Trace Metals by ICP by 6010B(Dissolved) (mg/L):			NA		
Antimony	<0.01	<0.01		NE	NE
Arsenic	<0.01	<0.01		NE	NE
Beryllium	<0.001	<0.001		NE	NE
Cadmium	<0.002	<0.002		NE	NE
Chromium	<0.01	<0.01		NE	NE
Copper	<0.01	<0.01		NE	NE
Lead	<0.004	<0.004		NE	NE
Nickel	<0.01	<0.01		NE	NE
Selenium	<0.01	<0.01		NE	NE
Silver	<0.002	<0.002		NE	NE
Thallium	<0.005	<0.005		NE	NE
Zinc	<0.01	<0.01		NE	NE
Volatiles by 8260B (ug/L):					
Acetone	<20	<20	<20	NE	NE
Acrylonitrile	<25	<25	<25	NE	NE
Benzene	<5	<5	<5	140	18000
Bromobenzene	<5	<5	<5	NE	NE
Bromochloromethane	<5	<5	<5	NE	NE
Bromodichloromethane	<5	<5	<5	NE	NE
Bromoform	<5	<5	<5	NE	NE
Bromomethane	<5	<5	<5	NE	NE
2-Butanone (MEK)	<10	<10	<10	NE	NE
n-Butylbenzene	<5	<5	<5	NE	NE
sec-Butylbenzene	<5	<5	<5	NE	NE
tert-Butylbenzene	<5	<5	<5	NE	NE
Carbon disulfide	<5	<5	<5	NE	NE
Carbon tetrachloride	<5	<5	<5	70	NE
Chlorobenzene	<5	<5	<5	3200	56000
Chloroethane	<5	<5	<5	NE	NE
Chloroform	7.6	6.9	<5	NE	NE
Chloromethane	<5	<5	<5	NE	NE
2-Chlorotoluene	<5	<5	<5	NE	NE
4-Chlorotoluene	<5	<5	<5	NE	NE
1,2-Dibromo-3-chloropropane (DBCP)	<2	<2	<2	2	NE
Dibromochloromethane	<5	<5	<5	NE	NE
1,2-Dibromoethane (EDB)	<5	<5	<5	NE	NE
Dibromomethane	<5	<5	<5	NE	NE
1,2-Dichlorobenzene	<5	<5	<5	NE	NE
1,3-Dichlorobenzene	<5	<5	<5	NE	NE
1,4-Dichlorobenzene	<5	<5	<5	NE	NE
Dichlorodifluoromethane	<5	<5	<5	NE	NE
1,1-Dichloroethane	<5	<5	<5	NE	NE
1,2-Dichloroethane	<5	<5	<5	110	670000
1,1-Dichloroethene	<5	<5	<5	7	23000
cis-1,2-Dichloroethene	<5	<5	<5	2400	69000
trans-1,2-Dichloroethene	<5	<5	<5	2800	79000
1,2-Dichloropropane	<5	<5	<5	3000	140000
1,3-Dichloropropane	<5	<5	<5	NE	NE
2,2-Dichloropropane	<5	<5	<5	NE	NE
1,1-Dichloropropene	<5	<5	<5	NE	NE
cis-1,3-Dichloropropene	<5	<5	<5	NE	NE
trans-1,3-Dichloropropene	<5	<5	<5	NE	NE
Ethylbenzene	<5	<5	<5	1600	16000
Hexachlorobutadiene	<5	<5	<5	NE	NE
2-Hexanone	<10	<10	<10	NE	NE
Isopropylbenzene	<5	<5	<5	NE	NE
4-Isopropyltoluene	<5	<5	<5	NE	NE
Methyl tert-butyl ether (MTBE)	<5	<5	<5	5000	NE
4-Methyl-2-pentanone (MIBK)	<10	<10	<10	NE	NE
Methylene chloride	<5	<5	<5	NE	NE
Naphthalene	<5	<5	<5	NE	NE
n-Propylbenzene	<5	<5	<5	NE	NE
Styrene	<5	<5	<5	2200	50000
1,2,3-Trichloropropane	<5	<5	<5	NE	NE
1,1,1,2-Tetrachloroethane	<5	<5	<5	NE	NE
1,1,2,2-Tetrachloroethane	<5	<5	<5	NE	NE
Tetrachloroethene (PCE)	<5	<5	<5	150	NE
Toluene	<5	<5	<5	1700	21000
1,2,3-Trichlorobenzene	<5	<5	<5	NE	NE
1,2,4-Trichlorobenzene	<5	<5	<5	NE	NE
1,1,1-Trichloroethane	<5	<5	<5	3100	68000
1,1,2-Trichloroethane	<5	<5	<5	NE	NE
Trichloroethene (TCE)	<5	16	<5	540	87000
Trichlorofluoromethane	<5	<5	<5	NE	NE
1,2,4-Trimethylbenzene	<5	<5	<5	NE	NE
1,3,5-Trimethylbenzene	<5	<5	<5	NE	NE
Vinyl chloride	<5	<5	<5	NE	NE
Total Xylenes	<5	<5	<5	NE	NE
Total Trihalomethanes	7.6	6.9	<5	NE	NE

US EPA ARCHIVE DOCUMENT

Table 7 (concluded)
Groundwater Analytical Results
February 19, 2002
One Greystone Avenue
North Providence, Rhode Island

Sample / Date	Concentration			RIDEM Method 1 Objective	RIDEM GB Groundwater UCL
	MW-1	MW-2	MW-3		
Analyte	2/19/2002	2/19/2002	2/19/2002	GB Groundwater	
Semivolatiles by GC/MS by SW-846 8270C (ug/L):	NA		NA		
Azobenzene		<5		NE	NE
Acenaphthene		<5		NE	NE
Acenaphthylene		<5		NE	NE
Aniline		<10		NE	NE
Anthracene		<5		NE	NE
Benzidine		<20		NE	NE
Benzo[a]anthracene		<5		NE	NE
Benzo[a]pyrene		<5		NE	NE
Benzo[b]fluoranthene		<5		NE	NE
Benzo[g,h,i]perylene		<5		NE	NE
Benzo[k]fluoranthene		<5		NE	NE
Benzoic acid		<25		NE	NE
Benzyl alcohol		<10		NE	NE
Benzyl butyl phthalate		<5		NE	NE
Bis(2-chloroethoxy)methane		<5		NE	NE
Bis(2-chloroethyl)ether		<5		NE	NE
Bis(2-chloroisopropyl)ether		<10		NE	NE
Bis(2-ethylhexyl)phthalate		<5		NE	NE
4-Bromophenyl phenyl ether		<5		NE	NE
4-Chloro-3-methylphenol		<5		NE	NE
4-Chloroaniline		<10		NE	NE
2-Chloronaphthalene		<5		NE	NE
2-Chlorophenol		<5		NE	NE
4-Chlorophenyl phenyl ether		<5		NE	NE
Chrysene		<5		NE	NE
Dibenz[a,h]anthracene		<5		NE	NE
Di-n-butyl phthalate		<5		NE	NE
Di-n-octyl phthalate		<5		NE	NE
Dibenzofuran		<10		NE	NE
1,2-Dichlorobenzene		<5		NE	NE
1,3-Dichlorobenzene		<5		NE	NE
1,4-Dichlorobenzene		<5		NE	NE
3,3-Dichlorobenzidine		<5		NE	NE
2,4-Dichlorophenol		<5		NE	NE
Diethyl phthalate		<5		NE	NE
Dimethyl phthalate		<5		NE	NE
2,4-Dimethylphenol		<5		NE	NE
2,4-Dinitrophenol		<5		NE	NE
2,4-Dinitrotoluene		<5		NE	NE
2,6-Dinitrotoluene		<5		NE	NE
Fluoranthene		<5		NE	NE
Fluorene		<5		NE	NE
Hexachlorobenzene		<5		NE	NE
Hexachlorobutadiene		<5		NE	NE
Hexachlorocyclopentadiene		<5		NE	NE
Hexachloroethane		<5		NE	NE
Indeno[1,2,3-cd]pyrene		<5		NE	NE
Isophorone		<5		NE	NE
2-Methyl-4,6-dinitrophenol		<5		NE	NE
2-Methylnaphthalene		<5		NE	NE
2-Methylphenol		<5		NE	NE
3- & 4-Methylphenols		<5		NE	NE
Naphthalene		<5		NE	NE
2-Nitroaniline		<10		NE	NE
3-Nitroaniline		<10		NE	NE
4-Nitroaniline		<10		NE	NE
Nitrobenzene		<5		NE	NE
2-Nitrophenol		<5		NE	NE
4-Nitrophenol		<5		NE	NE
N-Nitrosodi-n-propylamine		<5		NE	NE
N-Nitrosodimethylamine		<5		NE	NE
N-Nitrosodiphenylamine		<5		NE	NE
Pentachlorophenol		<5		NE	NE
Phenanthrene		<5		NE	NE
Phenol		<5		NE	NE
Pyrene		<5		NE	NE
2,4,5-Trichlorophenol		<5		NE	NE
2,4,6-Trichlorophenol		<5		NE	NE

Where necessary, the RIDEM objectives, in ppm, have been converted to ppb to match the laboratory reporting method.

NA: Analysis not performed
ND: No analytes detected above quantitation limits
NE: No allowable limit is established for the substance
<x: Indicates analyte concentration not detected at or above specified laboratory quantitation limit (x)

laboratory for analysis for PP13 and VOCs via EPA Method 8260B. Laboratory analytical results are summarized in **Table 8**. No exceedances of Method 1 GB Criteria or GB Upper Concentration Limit (UCL) were detected. Analytes not shown were below detection limits. Laboratory analytical reports, including Chain-of-Custody documentation, are included as **Appendix 4**.

Table 8
Groundwater Analytical Results
March 26, 2002
One Greystone Avenue
North Providence, Rhode Island

Sample / Date	Concentration					RIDEM Method 1 Objective	RIDEM GB Groundwater UCL
	MW-5	MW-6	MW-7	MW-8	MW-9	GB Groundwater	
Analyte	3/26/2002	3/26/2002	3/26/2002	3/26/2002	3/26/2002		
Mercury by Cold Vapor by SW-846 7470(Dissolved) (mg/L):	ND	ND	ND	ND	ND		
Trace Metals by ICP by 6010B(Dissolved) (mg/L):							
Zinc	<0.01	<0.01	<0.01	0.022	<0.01	NE	NE
Volatiles by 8260B (ug/L):							
1,2-Dibromo-3-chloropropane (DBCP)	<2 ^d	<2 ^d	<2 ^d	<2 ^d	<2 ^d	2	NE
Trichloroethene (TCE)	<5	<5	<5	59	7.7	540	87000

Where necessary, the RIDEM objectives, in ppm, have been converted to ppb to match the laboratory reporting method.

ND: No analytes detected above quantitation limits

NE: No allowable limit is established for the substance

<x: Indicates analyte concentration not detected at or above specified laboratory quantitation limit (x)

Sample Results:

d: Although the analyte was not detected, the laboratory quantitation limit for this sample exceeds RIDEM GB Groundwater Objectives

3.2 Current Investigatory Activities - March – May 2003

3.2.1 Ground Penetrating Radar Survey

Hager-Richter Geoscience, Inc. of Salem, New Hampshire performed a ground penetrating radar (GPR) survey across select locations at the Site on March 17, 2003. The survey was conducted in an effort to locate buried pipes, specifically outfalls to the river, and to locate a reported 1,500-gallon UST. Several anomalies were detected; however, results of the survey were inconclusive.