

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY..... 1

2.0 INTRODUCTION..... 2

 2.1 PURPOSE 2

 2.2 DETAILED SCOPE-OF-SERVICES 2

 2.3 SIGNIFICANT ASSUMPTIONS 2

 2.4 LIMITATIONS AND EXCEPTIONS 3

 2.5 SPECIAL TERMS AND CONDITIONS 3

3.0 SITE DESCRIPTION..... 3

4.0 USER PROVIDED INFORMATION 4

 4.1 OWNER, PROPERTY MANAGER, AND OCCUPANT INFORMATION 4

 4.2 REASON FOR PERFORMING PHASE I 4

5.0 RECORDS REVIEW..... 5

 5.1 STANDARD ENVIRONMENTAL RECORD SOURCES 5

 5.1.1 *Federal and State Agency Records* 5

 5.2 PREVIOUS ENVIRONMENTAL INVESTIGATIONS..... 6

 5.3 PHYSICAL SETTING SOURCES 7

 5.3.1 *USGS Topographic Maps* 7

 5.3.2 *USGS Bedrock Geology Map*..... 7

 5.3.3 *Historical Use Information on the Property*..... 8

 5.3.4 *Tax Assessor's Records*..... 8

 5.3.5 *Fire Insurance Maps*..... 9

 5.3.6 *USGS Maps*..... 10

 5.3.7 *Zoning/Land Use Records*..... 10

 5.3.8 *Fire Department Records*..... 10

6.0 SITE RECONNAISSANCE..... 10

 6.1 METHODOLOGY AND LIMITING CONDITIONS 10

 6.2 GENERAL SITE SETTING 10

 6.3 SITE OBSERVATIONS 11

 6.4 INTERIOR OBSERVATIONS 11

 6.4.1 *Stains or Corrosion*..... 11

 6.4.2 *Drains and Sumps*..... 11

 6.5 EXTERIOR OBSERVATIONS 11

 6.5.1 *Pits, Ponds, or Lagoons*..... 12

 6.5.2 *Underground Storage Tanks*..... 12

7.0 INTERVIEWS..... 12

 7.1 LOCAL GOVERNMENT OFFICIALS..... 12

8.0 FINDINGS 12

 8.1 CURRENT KNOWN OR SUSPECT ENVIRONMENTAL CONDITIONS 12

 8.2 HISTORICAL KNOWN OR SUSPECT ENVIRONMENTAL CONDITIONS 13

 8.3 DE MINIMUS CONDITIONS..... 13

9.0 OPINION 13

10.0 CONCLUSIONS & RECOMMENDATIONS..... 14

11.0 LIMITATIONS..... 15

1.0 EXECUTIVE SUMMARY

Lincoln Environmental, Inc. (Lincoln) was retained by Cumberland Farms, Inc. to conduct a Phase I Site Assessment of the property identified as Plat 14, Lot 516 located on Smith Street in North Providence, Rhode Island (the site). A Cumberland Farms, Inc. filling station abuts the site to the east. Lincoln's findings are summarized below:

- The site property is located on Smith Street in North Providence, Rhode Island. The property is identified by the North Providence Tax Assessor's Office as Plat 14, Lot 516. Currently the site consists of undeveloped land. Commercial properties make up the majority of the surrounding land usage.
- Lincoln completed a Site Investigation Report (SIR) at the adjacent Cumberland Farms facility located at 2064 Smith Street in March of 2001. Lincoln concluded that compounds commonly found in petroleum hydrocarbons had impacted soil and groundwater on the Cumberland Farms property at concentrations that exceed the RIDEM standards. Based on groundwater flow calculations, groundwater was calculated to flow in a southwesterly direction away from the site property.
- Lincoln identified the Centerdale Manor Restoration Project listed on the CERCLIS database as a property of environmental concern and a listed Superfund site. This property is located both in the site area and encompasses a portion of the adjacent Brook Village property, and sections of the Woonasquatucket River. The Brook Village property abuts the site to the west. The Centerdale Worsted Mills was located in the Brook Village area prior to 1936. Following the properties use as a woolen mill it was utilized as a chemical manufacturing company until the early 1970's. Past investigations conducted in the late 1970's and early 1980's identified "hundreds" of drums on the property in "various stages of deterioration".
- In 1997 and 1998 Roy F. Weston, Inc. (Weston) conducted sampling events at the Centerdale Manor property and the Brook Village property. Two sediment sample locations from Weston's sampling event are located on the western side of the subject site in a drainage channel and are identified as SD-07 and SD-09. Analytical results for these locations identified elevated concentrations of Dioxin's.
- Based on a review of Sanborn Fire Insurance Maps, the western portion of the site property maintained a Woolen Mill and a chemical manufacturing facility between 1921 and 1965. In addition a gasoline filling station was located north of the site property between, at least, 1951 and 1965.
- Based on site observations, Lincoln observed a few small trees and low lying vegetation. Wetland type vegetation was also observed at the southern portion of the site in what appeared to be a small brook during times of high water.
- Based on the information reviewed during this assessment, suspect environmental conditions have been identified at the site property.

2.0 INTRODUCTION

2.1 Purpose

The purpose of this report was to conduct a Phase I Site Assessment of the property identified as Plat 14, Lot 516 by the North Providence Tax Assessor's Office (the site). The site property is located on Smith Street adjacent to the Cumberland Farms Filling Station at 2064 Smith Street in North Providence, Rhode Island. This assessment was conducted with consideration to the American Society for Testing and Materials (ASTM) Designation E 1527-00, Standard Practice for Environmental Site Assessments. Per the ASTM Standard, the purpose of a Phase I Assessment is to identify recognized environmental conditions in connection with the site property, to the extent feasible pursuant to the processes prescribed in the standard. According to ASTM, recognized environmental conditions are defined as "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing or past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water."

2.2 Detailed Scope-of-Services

This assessment included a site visit, a radius search, and a review of public records for properties of environmental concern.

Local agency records and Rhode Island Department of Environmental Management (RIDEM), EPA CERCLIS, NPL, and RCRA listings were reviewed for changes in information pertaining to site ownership, emergency responses, documented or suspected release or disposal sites, and/or hazardous material use, storage, and generation.

Lincoln also conducted a site visit to document existing site conditions as they pertain to petroleum products and hazardous materials on visually accessible surface features.

2.3 Significant Assumptions

Information obtained from local, state, and/or federal agencies regarding the site or area properties, was assumed to be true and accurate and was not independently verified by Lincoln.

2.4 Limitations and Exceptions

Per the ASTM Standard, research conducted for this assessment was limited to information that was publicly available, practically reviewable, and obtainable within a reasonable time period for a reasonable cost. It should be noted that a review of reasonably ascertainable and practical standard historical sources resulted in prior site usage data gaps of greater than five-year intervals.

See Section 11.0 for further **Limitations** pertaining to this assessment.

2.5 Special Terms and Conditions

The environmental services provided were performed under the approved scope of work as set forth in Lincoln's signed proposal number 02R244 dated March 8, 2002. All work is subject to the Terms and Conditions attached to the original work authorization. As previously stated a **Limitations** section is also included as part of this assessment.

Per the ASTM Standard, there may be environmental issues or conditions at a property that a party or parties may wish to assess in connection with commercial real estate that are outside the scope of ASTM Designation E 1527-00. Whether or not a user elects to inquire into these non-scope considerations in connection with this practice or any other environmental site assessment, no assessment of such non-scope considerations is required for appropriate inquiry as defined by ASTM Designation E 1527-00.

3.0 SITE DESCRIPTION

The site property is located on Smith Street in North Providence, Rhode Island. The property is identified by the North Providence Tax Assessor's Office as Plat 14, Lot 516. Currently the site consists of undeveloped land. Commercial and residential properties make up the majority of the surrounding land usage. A Site Location Map, taken from the USGS topographical quadrangle map for the site area, is included as **Figure 1**.

Based on a review of the Tax Assessor's field card for the site property, the site consists of 16,500 square feet of land.

The site is located in an area zoned for commercial use. Access to the property can be attained from Smith Street. Surrounding land usage, as observed by Lincoln on April 4, 2002 is summarized in **Table 1**. A site plan depicting the site is included as **Figure 2**. A copy of the field card for the site parcel is included in **Appendix 1**.

Table 1	
Surrounding Land Usage	
Direction	Occupant (Apparent Usage)
North	Smith Street, commercial properties
East	Cumberland Farms, vacant land and commercial properties
South	Residential Apartment building, Woonasquatuckett River
West	Residential Apartment building and commercial properties

4.0 USER PROVIDED INFORMATION

The client/user provided no information pertaining to the site, regarding;

- Title Records,
- Environmental Liens or Activity and Use Limitations,
- Specialized Knowledge, or
- Valuation Reduction for Environmental Issues.

4.1 Owner, Property Manager, and Occupant Information

Information concerning environmental conditions of the site property was obtained from the owner of the site property. This information can be found in **Sections 6.3 through 6.4.2**.

4.2 Reason for Performing Phase I

This assessment is being performed to identify potential environmental conditions that may be associated with the site property.

5.0 RECORDS REVIEW

5.1 Standard Environmental Record Sources

Lincoln conducted a radius search review of surrounding properties of potential environmental concern as outlined in ASTM E 1527-00 guidelines utilizing software developed by the FirstSearch Technology Corporation. The radius search identifies properties with documented releases, complaints, or investigations with regard to petroleum products and/or hazardous materials. A copy of the FirstSearch™ Report is included as **Appendix 2**.

5.1.1 Federal and State Agency Records

The site property was not identified by the radius search. The property adjacent to the subject site was identified by the radius search on the Underground Storage Tank, Leaking Underground Storage Tank, State, and RCRA databases. One area property was identified by the FirstSearch report as a Superfund site listed on the CERLA database. Lincoln visited the Rhode Island Department of Environmental Management to review information regarding the identified properties. A discussion of Lincoln's findings are discussed below:

Centerdale Manor Restoration Project

Lincoln identified the Centerdale Manor Restoration Project listed on the CERCLIS database as a property of environmental concern. This property is located in the site area and encompasses the Centerdale Manor property, Brook Village property, and sections of the Woonasquatucket River. The Brook Village property abuts the site to the west. Based on information reviewed by Lincoln, previous investigations of these areas have identified the presence of organic and inorganic substances in soil, sediment, and surface water from sources including underground storage tanks, past site usage and leaking drums. The Centerdale Worsted Mills was located in the Brook Village area prior to 1936. Following the properties use as a woolen mill it was utilized as a chemical manufacturing company until the early 1970's. Past investigations conducted in the late 1970's and early 1980's identified "hundreds" of drums on the property in "various stages of deterioration". Stored in these drums were caustics, halogenated solvents, PCB's, ink wastes (heavy metals), and sulfuric acid. During this time, approximately one-hundred and fifty drums were observed scattered along the banks of the Woonasquatucket River.

In 1997 and 1998 Roy F. Weston, Inc. (Weston) conducted sampling events at the Centerdale Manor property and the Brook Village property. Two sediment sample locations from Weston's sampling event are located on the western side of the subject site in a drainage channel and are identified as SD-07 and SD-09. The sample depth at these locations was 0-6 inches below grade. Both of these samples are identified as "Reference" samples in Weston's, May 1997 Final Site Inspection Report. Analytical results for SD-07 and SD-09 identified 0.055 ug/l and 0.030 ug/l, respectively, of Dioxin.

"Dioxin's" describes a group of hundreds of chemicals that are highly persistent in the environment. The most toxic compound is 2,3,7,8-tetrachlorodibenzo-p-dioxin or TCDD. Dioxin is formed as an unintentional by-product of many industrial processes involving chlorine such as waste incineration, chemical and pesticide manufacturing and pulp and paper bleaching.

Based on the information from Weston's report, Dioxin's may be present in soil and/or sediment at the subject site. For reference purposes a copy of Weston's Final Site Inspection Report (May 16, 1997) and Final Summary Report For Expanded Site Inspection (March 9, 1999) for the Centerdale Manor property, are included as **Appendices 3 and 4** respectively.

5.2 Previous Environmental Investigations

Lincoln completed a Site Investigation Report (SIR) at the adjacent Cumberland Farms facility located at 2064 Smith Street in March of 2001. According to the obtained report, during petroleum piping upgrade activities in August 1998, impacted soil was noted and was attributed to routine operation and maintenance of the underground storage tank (UST) system and appurtenances. Excavation activities were performed in August 1998 in an attempt to achieve a reduction in volatile organic compounds (VOCs) to less than 20 parts per million (ppm). In this effort, approximately 74 tons of soil was transported off site for recycling via asphalt batching. A Release Characterization Report was submitted to the RIDEM in December 1998.

In a correspondence dated November 4, 1999 the RIDEM concurred with Lincoln to install a monitor well in the area of impact. A Monitor Well Installation/Sampling Letter Report was submitted to the RIDEM in January 2000. The monitor well tested positive for BTEX and MTBE compounds above the RIDEM GB groundwater standards, therefore requiring the RIDEM to request a site investigation.

In addition the March 8, 2001 SIR report states, the 2064 Smith Street property has operated as a gasoline filling station since at least 1983 under the ownership of VHS Realty Inc., which acquired the property in 1981. Site usage prior to 1981 is described as belonging to Herbert H. Sweet and Milton B. Sweet Estate, Inc. from 1971. Prior to 1971 and dating back to 1936, the Olneyville Wool Combing Company owned the property.

Lincoln installed three additional groundwater monitor wells on the Cumberland Farms property as part of the site investigation. Soil samples obtained during the installation process identified no detectable levels of volatile organic compounds. Based on groundwater samples obtained from the monitor wells, Lincoln concluded that compounds commonly found in petroleum hydrocarbons had impacted soil and groundwater on the Cumberland Farms property at concentrations that exceed the RIDEM standards. This impact was inferred to be limited to the immediate area surrounding MW-1 only. Lincoln recommended high vacuum extraction of impacted groundwater of MW-1, monthly for three consecutive months after which all wells would be resampled and submitted for analysis via EPA method 8260.

As of the date of this report, high vacuum extraction is completed on the CFI property on a monthly basis and quarterly monitoring of the groundwater monitor wells is completed on a quarterly basis.

Based on groundwater flow calculations, groundwater was calculated to flow in a southwesterly direction away from the site property. A copy of Lincoln's March 8, 2001 SIR report is included as **Appendix 5**.

5.3 Physical Setting Sources

5.3.1 USGS Topographic Maps

Based on a review of the USGS topographical map of the site area, the elevation at the site is approximately 115 feet above mean sea level (MSL). Area topography slopes southwest towards the Woonasquatucket River. As stated previously a site location map is included as **Figure 1**.

5.3.2 USGS Bedrock Geology Map

Based on a review of the 1994 USGS Bedrock Geology map of Rhode Island, the site area is underlain by the Esmond Igneous Suite, which consists of gray, tan, greenish or pale-pink granite.

5.3.3 Historical Use Information on the Property

Lincoln reviewed historical sources in an attempt to develop a history of the previous uses of the site and surrounding properties to help identify past uses that could have led to recognized environmental conditions in connection with the site property. Per Section 7.3.2 of the ASTM Standard, only useful and reasonably ascertainable standard historical sources are required to be reviewed, to the extent necessary to identify obvious uses of the site property back to its first obvious developed use or 1940, whichever is earlier. Review of historic sources at less than five year intervals is not required by the ASTM Standard, and certain historical sources may be excluded if they are either not reasonably ascertainable, or if past experience has shown that the source is not likely to be useful, accurate, or otherwise incomplete.

Research regarding historical land usage of the site and surrounding properties was conducted using data obtained from the following agencies:

- North Providence Town Clerk's Office;
- North Providence Tax Assessor's Office;
- North Providence Town Archives;
- North Providence Building Inspector's Office;
- North Providence Fire Department;
- FirstSearch Technology Corporation.

5.3.4 Tax Assessor's Records

According to information reviewed at the North Providence Tax Assessor's Office, the site consists of 16,500 square feet of undeveloped land currently zoned for commercial use. A copy of the Tax Assessor's field card for the site parcel is included in **Appendix 1**.

The site is identified as Plat 14, Lot 516. Recent ownership information for the site parcel as recorded at the North Providence Town Hall Offices is summarized in **Table 3**.

Table 2		
Ownership Chronology		
Date	Ownership	Book/Page
	H.E. Sweet	
	J. Buoanano and HJ Bonino et al.	
	Centerdale Enterprises, Inc.	40/542
5/10/71	Joseph E. Buoanano at al.	80/687
12/11/79	Joseph E. Buoanano and Edward Ricci	95/817
5/6/91	Andreoni, Orlando A. et al	220/1149
1/9/97	Robert Ashness	307/631
1/9/98	Dorothy Ricci	323/311
4/27/98	Andreoni, Orlando, A. and Edward Ricci	328/828

5.3.5 Fire Insurance Maps

Sanborn™ maps are historic maps that were drafted for fire insurance purposes and often are used for historic land use determinations. Lincoln requested that Environmental Data Resources, Inc. (EDR) review their historic map collection for Sanborn® and other historic maps of the site area. According to EDR, historic map coverage is available for the site area for the years 1965, 1956, 1951, and 1921. A copy of each of the supplied maps is enclosed as **Appendix 6**. A description of the site as depicted in each map is provided below.

1965 – The majority of the site property appears to consist of undeveloped land. However, a furniture warehouse and restaurant is pictured on the western portion of the site. Immediately, west of the site is the Metro Atlantic Chemical Manufacturing facility. A filling station is also depicted on the property north of Smith Street and adjacent to the site.

1956 – The site and surrounding area appear unchanged from the depiction in the previous map.

1951 – The adjacent chemical manufacturing plant is identified as the Atlantic Chemical Company. Five gasoline tanks are depicted on the adjacent filling station property. The furniture warehouse and restaurant are depicted on the western portion of the site property.

1921 – The western portion of the site property maintains the Centerdale Worsted Mills, with a shipping, reeling and spooling building closest to the site property. A second wool storage building is located at the rear of the site property.

5.3.6 USGS Maps

A portion of the USGS topographical map for the site and surrounding area is included as **Figure 1**. The site is depicted as urban land.

5.3.7 Zoning/Land Use Records

The site is located in an urban area. Commercial properties are located north and east of the site. The Woonasquatucket River and a Residential Apartment building are located south and west of the site property. Commercial/industrial properties abut the site on its eastern most terminus.

5.3.8 Fire Department Records

Lincoln contacted the North Providence Fire Department regarding hazardous materials, environmental concerns, or underground storage tanks at the site. According to the fire department personnel, no environmental conditions were identified for the site property.

6.0 SITE RECONNAISSANCE

Per the ASTM Standard, the purpose of the site reconnaissance is to visually and physically observe the site property and any on-site structures to try to identify recognized environmental conditions associated with the site. Lincoln visited the site on April 4, 2002. Observations and findings from Lincoln's site visit follow. Photographs taken during Lincoln's site visit are included as **Appendix 7**.

6.1 Methodology and Limiting Conditions

Please refer to **Sections 2.4** and **2.5** for a discussion limiting conditions.

6.2 General Site Setting

Information regarding the general site setting, including site and vicinity characteristics, as well as descriptions of structures, roads, and other improvements, was provided in **Section 3.0** of this report.

6.3 Site Observations

The site property currently consists of 16,500 square feet of undeveloped land. Lincoln observed a few small trees and low lying vegetation. Wetland type vegetation was also observed at the southern portion of the site in what appeared to be a small brook during times of high water. However, this area did not contain running water at the time of Lincoln's site visit. What appeared to be a small concrete foundation was observed on the surface of a grass area located at the center of the site property. The Cumberland Farms filling station was observed to abut the site property to the east, with three underground storage tanks containing gasoline located approximately fifty feet from the site property.

Lincoln did not observe any of the following during the site visit on the site property:

- Stained Soil or Pavement,
- Solid Waste (see Section 6.3),
- Waste Water (see Section 6.4.2),
- Wells, or
- Septic Systems

6.4 Interior Observations

No buildings or structures were identified on the site property during Lincoln's site visit.

6.4.1 Stains or Corrosion

No stains or visual signs of corrosion were identified within the on-site building or on the site properties.

6.4.2 Drains and Sumps

No drain or sumps were identified on the site property.

6.5 Exterior Observations

No buildings or structures were identified on the site property during Lincoln's site visit. Please refer to **Section 6.3** regarding observations of the site property.

6.5.1 Pits, Ponds, or Lagoons

No pits, ponds, or lagoons were observed at the time of Lincoln's site visit. Wetland type vegetation was observed at the rear (south) side of the property on what appeared to be a small brook during times of high water.

6.5.2 Underground Storage Tanks

No evidence of underground storage tanks was observed on the site property during the site visit portion of this assessment. However, three underground storage tanks are located approximately fifty feet east of the site property at the Cumberland Farms filling station.

7.0 INTERVIEWS

No additional interviews were conducted during the course of this assessment.

7.1 Local Government Officials

Information obtained from local governmental officials was provided in **Section 5.0** of this report.

8.0 FINDINGS

8.1 Current Known or Suspect Environmental Conditions

The site property is located in an area identified as a Superfund site, known as the Centerdale Manor Restoration Project. Based on information reviewed by Lincoln, previous investigations of these areas have identified the presence of organic and inorganic substances in soil, sediment, and surface water. The Centerdale Worsted Mills was located in the Brook Village area prior to 1936. Following the properties use as a woolen mill it was utilized as a chemical manufacturing facility until the early 1970's. Based on a review of historical fire insurance maps, the eastern portion of the former chemical manufacturing company was located in the vicinity of the site property.

Two sediment sample locations from a previous investigation are located on the western side of the subject site in a drainage channel. These sediment samples identified concentrations of Dioxins.

In addition, the site property is located adjacent to a Cumberland Farms gasoline filling station. Lincoln has documented a past release to soil and groundwater at this property. Currently monthly vacuum extraction takes place at this property, as well as quarterly groundwater sampling.

8.2 Historical Known or Suspect Environmental Conditions

The above mentioned Centerdale Manor Superfund property is also identified as a historical known environmental condition. Past investigations conducted in the late 1970's and early 1980's identified "hundreds" of drums on the property in "various stages of deterioration". Stored in these drums were caustics, halogenated solvents, PCB's, ink wastes (heavy metals), and sulfuric acid. In addition, approximately one-hundred and fifty drums were observed scattered along the banks of the Woonasquatucket River.

Based on a review of historical fire insurance maps a gasoline filling station occupied the property on the north side of Smith Street between at least 1951 and 1965. This former filling station maintained several underground storage tanks as depicted on the maps. No information as to removal of the tanks or conditions of soil and or groundwater in the vicinity of the former filling station could be identified. This property is located less then 200 feet from the northern terminus of the site property.

8.3 De Minimus Conditions

No De Minimus conditions were identified for the site property during the course of this assessment.

9.0 OPINION

Based on the information reviewed during this assessment, suspect environmental conditions have been identified at the site property. Information reviewed for this report identified a Superfund site adjacent to the site property identified as the Centerdale Manor Restoration Project. Sediment samples taken in the vicinity of the site property identified concentrations of Dioxins. In addition, the site is located adjacent to a Cumberland Farms gasoline station where a known release of gasoline to soil and groundwater has occurred. A review of historical fire insurance maps identified a former gasoline filling station that was located less than 200 feet north of the site property from at least 1951 through 1965. No information regarding this property could be identified.

10.0 CONCLUSIONS & RECOMMENDATIONS

Lincoln has performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E-1527 of the property identified as Plat 14, Lot 516 in North Providence, Rhode Island. Any Exceptions to, or deletions from, this practice are described in this report. This assessment has revealed evidence of recognized environmental conditions in connection with the site. Lincoln recommends that a Limited Subsurface Investigation be conducted at the site property to determine if off-site sources have impacted the site.

11.0 LIMITATIONS

Information obtained from public agencies and a site inspection was used to characterize the site. The accuracy of the conclusions derived from this information is based solely on the accuracy of the information reported. Events occurring on the site after the site visit are beyond the scope of this report. If information becomes available concerning the site that is not included in this report, it should be made available to Lincoln so that conclusions and/or recommendations can be re-examined and modified where applicable.

No attempt was made to determine the compliance of present or former owners or operators of the site with federal, state, or municipal environmental or land use laws or regulations.

Although the services are extensive, findings and conclusions are limited to and by the information obtained. Lincoln makes no expressed or implied representations or warranties regarding any changes in condition of the premises after the date of the site visit. In addition, subsurface investigatory methods are available that could further define the soil and groundwater conditions. Per ASTM standards, asbestos-containing materials, radon gas, lead-based paint, lead in drinking water, and wetlands issues are considered to be non-scope considerations and were not addressed during this assessment.

Any qualitative or quantitative information regarding the site, which was not available to Lincoln at the time of this assessment, may result in a modification of the representations made in this report.

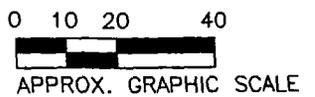
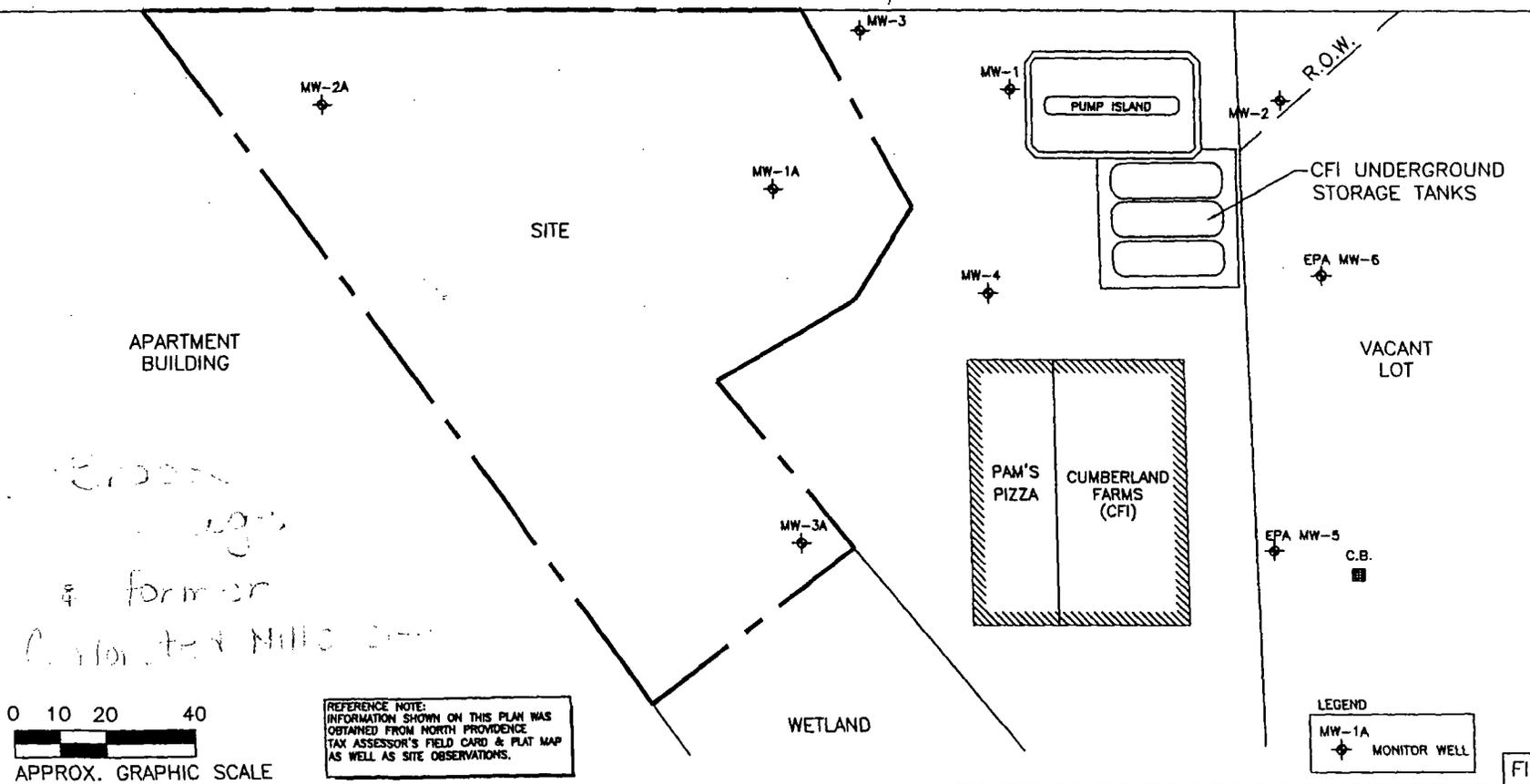
Lincoln has retained a copy of this report. No additions or deletions are permitted without the written consent of Lincoln. Use of this report in whole or in part by parties other than those authorized by Lincoln is prohibited.

COMMERCIAL PROPERTIES

SMITH STREET



C.B.



REFERENCE NOTE:
INFORMATION SHOWN ON THIS PLAN WAS
OBTAINED FROM NORTH PROVIDENCE
TAX ASSESSOR'S FIELD CARD & PLAT MAP
AS WELL AS SITE OBSERVATIONS.

LEGEND
MW-1A
MONITOR WELL

FIGURE 2

SITE PLAN

DATE: 4/9/02
LE JOB NO. RCF8338E

BY: TM
DWG: RCF8338ESP
Copyright © Lincoln Environmental, Inc.



Lincoln Environmental, Inc.
Smithfield, Rhode Island (401)232-3353

PLAT 14, LOT 516
SMITH STREET
NORTH PROVIDENCE, RHODE ISLAND

Other i.d.:

CURRENT OWNER				TOPO.	UTILITIES	STRT/ROAD	LOCATION	CURRENT ASSESSMENT					
ANDREONI ORLANDO A ET AL EDWARD W RICCI JOSEPH E BUONAN 2700 HOSPITAL TRUST PROVIDENCE, RI 02903				1Level	1All PubL	1Paved	4Bus. Dis	Description	Code	Appraised Value	Assessed Value	5410 NORTH PROVIDEN MMC	
				SUPPLEMENTAL DATA				COMM LAND	1420	56,900	56,900		
				Account No.: 01087010 SUB-DIV PHOTO WARD PREC.				COMMERCL	1420	1,000	1,000		
								Total		57,900	57,900		
RECORD OF OWNERSHIP				BK-VOL/PAGE	MO/DY/YR	SALE PRICE	V.C.	PREVIOUS ASSESSMENTS (HISTORY)					
ANDREONI ORLANDO A ET AL						0		Yr	Code	Assessed Value	Yr	Code	Assessed Value
								Total			Total		Total
EXEMPTIONS				OTHER ASSESSMENTS				THIS SIGNATURE ACKNOWLEDGES A VISIT BY A DATA COLLECTOR OR ASSESSOR X					
Year	Type/Description	Code	Amount	Code	Description	Number	Amount					Comm. Int.	
Total			0.00										
COMPARABLE				APPRAISED VALUE SUMMARY									
Rtng	Parcel I.D./MBLU			Md Yr	Value	Adjust.	Adjust. Value	Appraised Bldg. Value (Card) 0					
								Appraised X.F.(B) Value (Bldg) 0					
								Appraised O.B.(L) Value (Bldg) 1,000					
								Appraised Land Value (Bldg) 56,900					
								Special Land Value 0					
								Total Appraised Card Value 57,900					
								Total Appraised Parcel Value 57,900					
								Exemption(s)					
								Net Total Appraised Parcel Value		57,900			

BUILDING PERMIT RECORD								VISIT/CHANGE HISTORY				
Permit I.D.#	Issue Date	Type	Description	Amount	Insp. Date	%Cmp	Date Cmp	Comments	Date	I.D.	Cd	Purpose/Result
									11/29/94	JF	00	Measur+Listed

LAND LINE DATA AND VALUATION SECTION																	
B#	UsCd	Description	Zone	D	Fmtg	Depth	No. of Units	Tp	Unit Price	I Fctr	Sl	Cn Fct	Nhbhd	Adj.	Notes-Adj/Spcl Lnd Prng	Adj. Unit Price	Land Value
1	3030	ACC COM LD	BL				16,550.00	SF	2.29	1.00	0	1.00	8000	1.50		3.44	56,900
Total Land Units							16,550.00	SF								Total	56,900

CONSTRUCTION DETAIL										SKETCH								
Element	Cd	Ch	Description		Commercial Data/Elements													
Style/Type	94		Outbuildings		Element	Cd	Ch	Description										
Model	00		Vacant		Heat + A/C													
Grade					Frame Type													
Stories					Baths/Plmng													
Occupancy					Ceiling/Wl Fr													
Exter. Wall	1				Rooms/Prtns													
	2				% Com.Wall													
Roof Structure					Wall Height													
Roof Cover					Condo./Coop. Data													
Inter. Wall	1				Description	Code	Description	Factor										
	2				Cndo. Cmplx													
Inter. Floor	1				Floor Adj.													
	2				Unit Locatn													
Heating Fuel					Numbr Units													
Type					Numbr Levis													
Air/Cn	Type				% Ownership													
Bedrooms					COST/MARKET VALUATION													
Bathrooms					Unadj Base Rate													
Total Rooms					Size Adj Factor													
Bath Type					Grade(Q) Index													
Kitchen Style					Adj Base Rate													
NOTES					Bldg Value New													
GRASS AREA FOR BROOK VILLAGE					Year Built													
					Efectve Yr Built													
					Nrml Physcl Dep													
					Functnl Obslnc													
					Eco/Ext Obslnc													
					Spec'l Cnd Code													
					Spec'l Cnd %													
					Overall % Cndtn					0								
					Deprec Bldg Value													
OB-OUTBUILDINGS & YARD ITEMS (L)										BUILDING SUB-AREA SUMMARY SECTION								
Code	Description	L	Units	Unit Price	Yr.	Dp Rt	%Cnd	Appr. Value		Code	Description	Gross Area	Eff. Area	Unit Cost	Undeprec. Value			
LT1	LIGHTS-IN W/P L		3	690.00	82	0.00	50	1,000										
Total OB Value										Ttl. Gross Liv/Lease Area		0	0	Bldg Value				
1,000																		
INCOME SECTION										XF-BUILDING EXTRA FEATURES (B)								
										Code	Description	Bf	Units	Unit Price	Yr.	Dp Rt	%Cnd	Appr. Value
										(Sketch) Traverse Code						Total XF Value	0	

FirstSearch Technology Corporation

Environmental FirstSearch™ Report

TARGET PROPERTY:

2064 SMITH ST

NORTH PROVIDENCE RI 02911

Job Number: RCF8338G

PREPARED FOR:

Lincoln Environmental, Inc.

333 Washington Highway

Smithfield, RI 02917

Environmental Consultants and Engineers

04-02-02



Tel: (781) 320-3720

Fax: (781) 320-3715

**Environmental FirstSearch
Search Summary Report**

Target Site: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

FirstSearch Summary

Database	Sel	Updated	Radius	Site	1/8	1/4	1/2	1/2 >	ZIP	TOTALS
NPL	Y	01-09-02	1.00	0	0	0	0	0	0	0
CERCLIS	Y	01-09-02	0.50	0	1	0	1	-	0	2
RCRA TSD	Y	01-14-02	0.50	0	0	0	0	-	0	0
RCRA COR	Y	01-14-02	1.00	0	0	0	0	0	0	0
RCRA GEN	Y	01-14-02	0.25	0	2	3	-	-	4	9
RCRA NLR	Y	01-14-02	0.25	1	2	1	-	-	1	5
ERNS	Y	12-31-00	0.25	0	1	0	-	-	3	4
NPDES	N	01-14-02	0.25	-	-	-	-	-	-	-
FINDS	N	07-08-01	0.25	-	-	-	-	-	-	-
TRIS	N	07-16-98	0.25	-	-	-	-	-	-	-
State Sites	Y	01-09-02	1.00	0	4	0	4	9	6	23
Spills-1990	N	01-04-01	0.25	-	-	-	-	-	-	-
Spills-1980	N	NA	0.25	-	-	-	-	-	-	-
SWL	Y	01-24-01	0.50	0	0	0	0	-	1	1
Permits	N	NA	0.25	-	-	-	-	-	-	-
Other	N	NA	0.25	-	-	-	-	-	-	-
REG UST/AST	Y	02-19-01	0.25	1	5	5	-	-	4	15
Leaking UST	Y	01-09-02	0.50	0	2	3	3	-	1	9
State Wells	N	07-11-00	0.50	-	-	-	-	-	-	-
Aquifers	N	10-21-98	0.50	-	-	-	-	-	-	-
ACEC	N	03-15-00	0.50	-	-	-	-	-	-	-
Wetlands	N	11-20-00	0.50	-	-	-	-	-	-	-
Floodplains	N	05-13-98	0.50	-	-	-	-	-	-	-
Receptors	Y	01-01-95	0.50	0	0	0	0	-	0	0
Nuclear Permits	N	04-30-99	0.50	-	-	-	-	-	-	-
Historic/Landmark	N	03-08-01	0.50	-	-	-	-	-	-	-
Federal Land Use	N	06-17-98	0.50	-	-	-	-	-	-	-
Federal Wells	N	NA	0.50	-	-	-	-	-	-	-
Releases(Air/Water)	N	01-06-00	0.25	-	-	-	-	-	-	-
- TOTALS -				2	17	12	8	9	20	68

Notice of Disclaimer

Due to the limitations, constraints, inaccuracies and incompleteness of government information and computer mapping data currently available to DataMap Technology Corp., certain conventions have been utilized in preparing the locations of all federal, state and local agency sites residing in DataMap Technology Corp.'s databases. All EPA NPL and state landfill sites are depicted by a rectangle approximating their location and size. The boundaries of the rectangles represent the eastern and western most longitudes; the norther and southern most latitudes. As such, the mapped areas may exceed the actual areas and do not represent the actual boundaries of these properties. All other sites are depicted by a point representing their approximate address location and make no attempt to represent the actual areas of the associated property. Actual boundaries and locations of individual properties can be found in the files residing at the agency responsible for such information.

Waiver of Liability

Although DataMap Technology Corp. uses its best efforts to research the actual location of each site, DataMap Technology Corp. does not and can not warrant the accuracy of these sites with regard to exact location and size. All authorized users of DataMap Technology Corp.'s services proceeding are signifying an understanding of DataMap Technology Corp.'s searching and mapping conventions, and agree to waive any and all liability claims associated with search and map results showing incomplete and or inaccurate site locations.

**Environmental FirstSearch
Site Information Report**

Request Date: 04-02-02
Requestor Name: M. Scherer
Standard: ASTM

Search Type: COORD
Job Number: RCF8338G

Target Address: 2064 SMITH ST
 NORTH PROVIDENCE RI 02911

Demographics

Sites: 68	Non-Geocoded: 20	Population: NA
Radon: 0.6 - 5.7 PC/L		

Site Location

	<u>Degrees (Decimal)</u>	<u>Degrees (Min/Sec)</u>	<u>UTMs</u>
Longitude:	-71.485824	-71:29:9	Easting: 293660.598
Latitude:	41.858176	41:51:29	Northing: 4636804.386
		Zone:	19

Comment

Comment:

Additional Requests/Services

Adjacent ZIP Codes: 1.00 Mile(s)	Services:
---	------------------

<u>ZIP</u>	<u>Code</u>	<u>City Name</u>	<u>ST</u>	<u>Dist/Dir</u>	<u>Sel</u>
02904	PROVIDENCE	RI	0.56 NE	N	
02917	SMITHFIELD	RI	0.81 NW	N	
02919	JOHNSTON	RI	0.08 SW	Y	

	<u>Requested?</u>	<u>Date</u>
Sanborns	Y	4/02/200
Aerial Photographs	N	
Topo Maps (hardcopy)	N	
City Directories	N	
Title Search	N	
Municipal Reports	N	
Online Topo Map	N	

Environmental FirstSearch Sites Summary Report

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

TOTAL: 68 **GEOCODED:** 48 **NON GEOCODED:** 20 **SELECTED:** 4

ID	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
1	CERCLIS	ABATE & URSILLO PLATNG (FORMER) RID987466026/NFRAP-N	115 RAILROAD AVENUE JOHNSTON RI 02919	0.46 SE	1
2	CERCLIS	CENTREDALE MANOR RESTORATION PROJEC RID981203755/FINAL	2072 AND 2074 SMITH STREET (RO NORTH PROVIDEN RI 02911	0.03 SW	2
3	RCRAGN	EVANS PLATING CORP RID000769661/LGN	2 PUTNAM AVE JOHNSTON RI 02919	0.12 NW	3
4	RCRAGN	EVANS PLATING CORP RID001191931/LGN	50 WATERMAN AVE NORTH PROVIDEN RI 02911	0.12 NW	4
5	RCRAGN	PRECISION AUTO RID987467123/SGN	100 SOUTH ST JOHNSTON RI 02919	0.23 SW	6
6	RCRAGN	PUTNAM COLLISION SERV RIR000013326/VGN	33 PUTNAM AVE JOHNSTON RI 02919	0.18 NW	7
7	RCRAGN	WALGREENS 3719 RI5000011585/SGN	25 PUTNAM PIKE JOHNSTON RI 02919	0.16 NW	9
8	RCRANLR	CUMBERLAND FARMS #3843 RID982193674/NLR	2064 SMITH ST NORTH PROVIDEN RI 02911	0.03 NE	10
9	RCRANLR	CUMBERLAND FARMS 3843 RID987480472/NLR	2065 SMITH ST NORTH PROVIDEN RI 02911	0.03 NE	10
10	RCRANLR	ESMOND MFG INC RIR000015891/NLR	60 WATERMAN AVE NORTH PROVIDEN RI 02911	0.05 NE	11
11	RCRANLR	ULTRA TUNE INC RI5000009076/NLR	26 PUTNAM AVE JOHNSTON RI 02919	0.20 NW	12
12	ERNS	S41262/FIX FAC	2060 SMITH ST. N. PROVIDENCE RI 02911	0.01 SE	13
13	STATE	ABATE AND URSILLO A&U-HWM/INACTIVE	115 RAILROAD AVENUE JOHNSTON RI 02919	0.46 SE	1
14	STATE	ABATE AND URSILLO A&U-SFA/INACTIVE	115 RAILROAD AVENUE JOHNSTON RI 02919	0.46 SE	1
15	STATE	ALLENDALE MILL ALLM-HWM/INACTIVE	494 WOONASQUATUCKET AVE. NORTH PROVIDEN RI 02911	0.61 SE	14
16	STATE	CENTREDALE MANOR CLMN-SFA/ACTIVE	2072 SMITH STREET NORTH PROVIDEN RI 02911	0.03 NW	15
17	STATE	CENTREDALE MANOR CLMN-NPL/ACTIVE	2072 SMITH STREET NORTH PROVIDEN RI 02911	0.03 SW	2
18	STATE	ED S AUTO PARTS EDA-HWM/INACTIVE	83 RAILROAD AVENUE JOHNSTON RI 02919	0.62 SE	16
19	STATE	EVANS PLATING EVAN-HWM/ACTIVE	50 WATERMAN AVENUE, PO BOX 118 NORTH PROVIDEN RI 02911	0.12 NW	4
20	STATE	F. RONCI-1 FRI-HWM/ACTIVE	7800 SMITH STREET NORTH PROVIDEN RI 02911	0.74 SE	17

Environmental FirstSearch Sites Summary Report

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

TOTAL: 68 **GEOCODED:** 48 **NON GEOCODED:** 20 **SELECTED:** 4

ID	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
21	STATE	F. RONCI-2 FR2-HWM/ACTIVE	2 ATLANTIC AVENUE NORTH PROVIDEN RI 02904	0.70 SE	18
22	STATE	FUTURE FUNINSHING TECHONOLOGIES, IN FFT1-HWM/ACTIVE	178 GEORGE WATERMAN ROAD JOHNSTON RI 02919	0.90 SW	19
23	STATE	GREYSTONE MOTORS GMO-HWM/INACTIVE	129 WATERMAN AVENUE NORTH PROVIDEN RI 02911	0.38 NW	5
24	STATE	MEHAN CONSTRUCTION MEH-HWM/INACTIVE	79 PUTNAM AVE JOHNSTON RI 02919	0.38 NW	20
25	STATE	METRO ATLANTIC/BROOK VILLAGE META-HWM/ACTIVE	2075 SMITH STREET NORTH PROVIDEN RI 02911	0.04 NW	21
26	STATE	PAT S AUTO SALES PAS-HWM/INACTIVE	84 RAILROAD AVENUE JOHNSTON RI 02919	0.62 SE	22
27	STATE	TANURY G PLATING TNPL-HWM/INACTIVE	100 RAILROAD AVENUE JOHNSTON RI 02919	0.74 SE	23
28	STATE	TOWN ASPHALT/AUTO FLUFF TAAF-HWM/INACTIVE	100 ALLENDALE AVENUE JOHNSTON RI 02919	0.55 SE	24
29	STATE	WORCESTER COMPANY (NO FILE) WCO-HWM/ACTIVE	GREYSTONE AVENUE NORTH PROVIDEN RI 02911	0.57 NW	25
30	UST	BROOK VILLAGE ASSOCIATES 03324	2072 SMITH ST NORTH PROVIDEN RI 02911	0.03 NW	15
31	UST	CENTREDALE MANOR APARTMENT 01398	2074 SMITH ST NORTH PROVIDEN RI 02911	0.03 SW	2
32	UST	CUMBERLAND FARMS, INC. 00771	2064 SMITH ST NORTH PROVIDEN RI 02911	0.03 NE	10
33	UST	DIPIETRO S SERVICE CENTER 01748	31 PUTNAM PIKE JOHNSTON RI 02919	0.22 NW	26
34	UST	EVANS PLATING CORP. 02307	2 PUTNAM AVE JOHNSTON RI 02919	0.12 NW	3
35	UST	MILTON SWEET ESTATE, INC. 17259	2060-2062 SMITH STREET NORTH PROVIDEN RI 02911	0.03 SE	28
36	UST	NEW ENGLAND TELEPHONE 01189	2194 MINERAL SPRING AVE NORTH PROVIDEN RI 02911	0.23 NE	29
37	UST	ROBBIN FUNERAL HOME 15742	2251 MINERAL SPRING AVENUE NORTH PROVIDEN RI 02911	0.09 SE	30
38	UST	STATE OF RI/E-911 EMER TELE SYS 16503	1951 SMITH STREET NORTH PROVIDEN RI 02911	0.25 SE	31
39	UST	TOWN LINE FRUIT 16623	25 PUTNAM PIKE JOHNSTON RI 02919	0.16 NW	9
40	UST	WILLY S GARAGE 00140	1954 SMITH STREET NORTH PROVIDEN RI 02911	0.23 SE	32

Environmental FirstSearch Sites Summary Report

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

TOTAL: 68 **GEOCODED:** 48 **NON GEOCODED:** 20 **SELECTED:** 4

ID	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
41	LUST	BELL ATLANTIC 2422-ST/A - ACTIVE	2194 MINERAL SPRING AVENUE NORTH PROVIDEN RI 02911	0.24 NE	33
42	LUST	CUMBERLAND FARMS 2425-LS/A - ACTIVE	2064 SMITH ST NORTH PROVIDEN RI 02911	0.03 NE	10
43	LUST	DIPIETRO S SERVICE CENTER 1618-LS/SRO - SOIL REMOVAL O	31 PUTNAM PIKE JOHNSTON RI 02919	0.22 NW	26
44	LUST	E-911 EMERGENCY TELEPHONE SYSTEM 2410-LS/I - INACTIVE	1951 SMITH STREET NORTH PROVIDEN RI 02911	0.25 SE	31
45	LUST	EVANS PLATING 2408-ST/I - INACTIVE	50 WATERMAN STREET NORTH PROVIDEN RI 02911	0.12 NW	4
46	LUST	EXPRESS SERVICE STATION 0712-LS/SRO - SOIL REMOVAL O	100 EAST AVENUE CRANSTON RI 02911	0.45 SE	27
47	LUST	MAXWELL TRUCKING & NORTHEAST BUSING 2423-ST/SRO - SOIL REMOVAL O	85 EAST AVE NORTH PROVIDEN RI 02911	0.40 SE	34
48	LUST	SGAMBATA TEXACO 2414-LS/SRO - SOIL REMOVAL O	603 WOONASQUATUCKET AVENUE NORTH PROVIDEN RI 02911	0.33 SE	8

Environmental FirstSearch Sites Summary Report

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

TOTAL: 68 **GEOCODED:** 48 **NON GEOCODED:** 20 **SELECTED:** 4

ID	DB Type	Site Name/ID/Status	Address	Dist/Dir	Map ID
49	RCRAGN	DAVE S HUB & DIE ETCHING RIR000500959/SGN	146B WATERMAN AVE NORTH RI 02911	NON GC	
50	RCRAGN	CLASSIC SEAL COATING INC RIR000501676/SGN	15 INDUSTRIAL LN JOHNSTON RI 02919	NON GC	
51	RCRAGN	RI STATE ENERGY PARTNERS LP RIR000501197/SGN	24 SHUN PIKE JOHNSTON RI 02919	NON GC	
52	RCRAGN	ROAD ISLAND RED INC RIR000501734/SGN	143 SHUN PIKE JOHNSTON RI 02919	NON GC	
53	RCRANLR	LASER LUBE RID987469434/NLR	1159 PUTNAM AVE JOHNSTON RI 02919	NON GC	
54	ERNS	THE WORCESTER CO. 152923/FIXED FACILITY	GROYSTONE AVE. CENTERDALE RI 02911	NON GC	
55	ERNS	QUALITY HOMES 218536/FIXED FACILITY	PECK HILL RD-OFF PLAINFIELD PI JOHNSTON RI 02919	NON GC	
56	ERNS	UNKNOWN 226896/FIXED FACILITY	MILL ST & JOHNSON ST JOHNSTON RI 02919	NON GC	
57	STATE	CHEMLAWN CHLW-HWM/INACTIVE	MARIBETH DRIVE JOHNSTON RI 02919	NON GC	
58	STATE	DISPOSAL PITS/PLAT 43 LOTS 43 AND 1 L43-HWM/ACTIVE	SHUN PIKE JOHNSTON RI 02919	NON GC	
59	STATE	LOT 66 LT66-HWM/M	SHUN PIKE JOHNSTON RI 02919	NON GC	
60	STATE	NARR ELECTRIC-KILLINGLY RIGHT OF WA NERW-HWM/INACTIVE	KILLINGLY STREET JOHNSTON RI 02919	NON GC	
61	STATE	NARR. BAY COMMISSION INTERCEPTOR NBCJ-HWM/ACTIVE	GREENVILLE, LYMAN, NEWMAN, DYE JOHNSTON RI 02919	NON GC	
62	STATE	WPRO TRANSMITTER SITE WPRO-HWM/INACTIVE	JAQUELINE DRIVE JOHNSTON RI 02919	NON GC	
63	SWL	RI RESOURCE RECOVERY CORP -CENTRAL- RISW-6/ACTIVE	SHUN PIKE JOHNSTON RI 02919	NON GC	
64	UST	B MACERONI & SONS FUNERAL HOME 18842	1382 SMITH ST NORTH PROVIDEN RI 02911	NON GC	
65	UST	PRATA FUNERAL HOME 18694	1488 WESTMINSTER ST NORTH PROVIDEN RI 02911	NON GC	
66	UST	WANSKUCK HALL 18612	754 BRANCH AVE NORTH PROVIDEN RI 02911	NON GC	
67	UST	GREENVILLE PUMP STATION 18732	GREENVILLE AVENUE JOHNSTON RI 02919	NON GC	
68	LUST	CUMBERLAND FARMS 2415-LS/I - INACTIVE	CUMBERLAND FARMS NORTH PROVIDEN RI	NON GC	

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB: RCF8338G

CERCLIS SITE			
SEARCH ID: 1	DIST/DIR: 0.46 SE	MAP ID: 1	
NAME: ABATE & URSILLO PLATING (FORMER)	REV: 3/8/02		
ADDRESS: 115 RAILROAD AVENUE	ID1: RID987466026		
JOHNSTON RI 02919	ID2: 0102558		
CONTACT:	STATUS: NFRAP-N		
	PHONE:		
DESCRIPTION:			
ACTION/QUALITY	AGENCY/RPS	START/RAA	END
ARCHIVE SITE			01-25-1996
DISCOVERY	State, Fund Financed		11-07-1991
PRELIMINARY ASSESSMENT Low	State, Fund Financed		02-18-1993
SITE INSPECTION NFRAP (No Futher Remedial Action Planned	State, Fund Financed	05-10-1994	10-18-1995

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

RCRA NLR SITE

SEARCH ID: 10

DIST/DIR: 0.05 NE

MAP ID: 11

NAME: ESMOND MFG INC
ADDRESS: 60 WATERMAN AVE
NORTH PROVIDENCE RI 02911

REV: 1/14/02
ID1: RIR000015891
ID2:
STATUS: NLR
PHONE: 4019429103

CONTACT: GERALD DIONNE

SITE INFORMATION

CONTACT INFORMATION: GERALD DIONNE
OWNER
60 WATERMAN AVE
NORTH PROVIDENCE RI 02911

PHONE: 4019429103

UNIVERSE NAME:

NO LONGER REGULATED

SIC INFORMATION:

ENFORCEMENT INFORMATION:

VIOLATION INFORMATION:

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

STATE SITE			
SEARCH ID: 13	DIST/DIR: 0.46 SE	MAP ID: 1	
NAME: ABATE AND URSILLO ADDRESS: 115 RAILROAD AVENUE JOHNSTON RI 02919		REV: 1/9/02 ID1: A&U-HWM ID2: STATUS: INACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE:			

STATE SITE			
SEARCH ID: 14	DIST/DIR: 0.46 SE	MAP ID: 1	
NAME: ABATE AND URSILLO ADDRESS: 115 RAILROAD AVENUE JOHNSTON RI 02919		REV: 1/9/02 ID1: A&U-SFA ID2: STATUS: INACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE:		11/07/91	

STATE SITE			
SEARCH ID: 15	DIST/DIR: 0.61 SE	MAP ID: 14	
NAME: ALLENDALE MILL ADDRESS: 494 WOONASQUATUCKET AVE. NORTH PROVIDENCE RI		REV: 1/9/02 ID1: ALLM-HWM ID2: STATUS: INACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE:			

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

STATE SITE			
SEARCH ID: 16	DIST/DIR: 0.03 NW	MAP ID: 15	
NAME: CENTREDALE MANOR ADDRESS: 2072 SMITH STREET NORTH PROVIDENCE RI		REV: 1/9/02 ID1: CLMN-SFA ID2: STATUS: ACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE: 04/10/86			

STATE SITE			
SEARCH ID: 17	DIST/DIR: 0.03 SW	MAP ID: 2	
NAME: CENTREDALE MANOR ADDRESS: 2072 SMITH STREET NORTH PROVIDENCE RI		REV: 1/9/02 ID1: CLMN-NPL ID2: STATUS: ACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE:			

STATE SITE			
SEARCH ID: 18	DIST/DIR: 0.62 SE	MAP ID: 16	
NAME: ED S AUTO PARTS ADDRESS: 83 RAILROAD AVENUE JOHNSTON RI 02919		REV: 1/9/02 ID1: EDA-HWM ID2: STATUS: INACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE:			

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

STATE SITE			
SEARCH ID: 19	DIST/DIR: 0.12 NW	MAP ID: 4	
NAME: EVANS PLATING ADDRESS: 50 WATERMAN AVENUE, PO BOX 118 NORTH PROVIDENCE RI		REV: 1/9/02 ID1: EVAN-HWM ID2: STATUS: ACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE: 07/02/99			

STATE SITE			
SEARCH ID: 20	DIST/DIR: 0.74 SE	MAP ID: 17	
NAME: F. RONCI-1 ADDRESS: 7800 SMITH STREET NORTH PROVIDENCE RI		REV: 1/9/02 ID1: FR1-HWM ID2: STATUS: ACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE:			

STATE SITE			
SEARCH ID: 21	DIST/DIR: 0.70 SE	MAP ID: 18	
NAME: F. RONCI-2 ADDRESS: 2 ATLANTIC AVENUE NORTH PROVIDENCE RI		REV: 1/9/02 ID1: FR2-HWM ID2: STATUS: ACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE:			

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

STATE SITE			
SEARCH ID: 22	DIST/DIR: 0.90 SW	MAP ID: 19	
NAME: FUTURE FUNINSHING TECHONOLOGIES, INC ADDRESS: 178 GEORGE WATERMAN ROAD JOHNSTON RI 02919		REV: 1/9/02 ID1: FFTI-HWM ID2: STATUS: ACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE: 11/10/00			

STATE SITE			
SEARCH ID: 23	DIST/DIR: 0.38 NW	MAP ID: 5	
NAME: GREYSTONE MOTORS ADDRESS: 129 WATERMAN AVENUE NORTH PROVIDENCE RI		REV: 1/9/02 ID1: GMO-HWM ID2: STATUS: INACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE: 04/20/94			

STATE SITE			
SEARCH ID: 24	DIST/DIR: 0.38 NW	MAP ID: 20	
NAME: MEHAN CONSTRUCTION ADDRESS: 79 PUTNAM AVE JOHNSTON RI 02919		REV: 1/9/02 ID1: MEH-HWM ID2: STATUS: INACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE:			

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

STATE SITE			
SEARCH ID: 25	DIST/DIR: 0.04 NW	MAP ID: 21	
NAME: METRO ATLANTIC/BROOK VILLAGE ADDRESS: 2075 SMITH STREET NORTH PROVIDENCE RI		REV: 1/9/02 ID1: META-HWM ID2: STATUS: ACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE: 11-09-98			

STATE SITE			
SEARCH ID: 26	DIST/DIR: 0.62 SE	MAP ID: 22	
NAME: PAT S AUTO SALES ADDRESS: 84 RAILROAD AVENUE JOHNSTON RI 02919		REV: 1/9/02 ID1: PAS-HWM ID2: STATUS: INACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE:			

STATE SITE			
SEARCH ID: 27	DIST/DIR: 0.74 SE	MAP ID: 23	
NAME: TANURY G PLATING ADDRESS: 100 RAILROAD AVENUE JOHNSTON RI 02919		REV: 1/9/02 ID1: TNPL-HWM ID2: STATUS: INACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE: 01/21/93			

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

STATE SITE			
SEARCH ID: 28	DIST/DIR: 0.55 SE	MAP ID: 24	
NAME: TOWN ASPHALT/AUTO FLUFF ADDRESS: 100 ALLENDALE AVENUE JOHNSTON RI 02919		REV: 1/9/02 ID1: TAAF-HWM ID2: STATUS: INACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE:			

STATE SITE			
SEARCH ID: 29	DIST/DIR: 0.57 NW	MAP ID: 25	
NAME: WORCESTER COMPANY (NO FILE) ADDRESS: GREYSTONE AVENUE NORTH PROVIDENCE RI		REV: 1/9/02 ID1: WCO-HWM ID2: STATUS: ACTIVE PHONE:	
CONTACT:			
<u>SITE INFORMATION</u>			
PROJECT DATE:			

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB: RCF8338G

REGISTERED UNDERGROUND STORAGE TANKS			
SEARCH ID: 30	DIST/DIR: 0.03 NW	MAP ID: 15	
NAME: BROOK VILLAGE ASSOCIATES ADDRESS: 2072 SMITH ST NORTH PROVIDENCE RI		REV: 2/19/01 ID1: 03324 ID2: STATUS: PHONE:	
CONTACT:			
	<u>TANKS</u>	<u>INSTALLED</u>	<u>CAPACITY</u>
CURRENT:	1	09-98	10,000
REMOVED:			
PERMANENT:	1	04-77	10,000
UNKNOWN:			
TEMP:			
CLOSED:			
PRODUCT STORED: #2 FUEL OIL/HOME HEATING OIL			

REGISTERED UNDERGROUND STORAGE TANKS			
SEARCH ID: 31	DIST/DIR: 0.03 SW	MAP ID: 2	
NAME: CENTREDALE MANOR APARTMENT ADDRESS: 2074 SMITH ST NORTH PROVIDENCE RI		REV: 2/19/01 ID1: 01398 ID2: STATUS: PHONE:	
CONTACT:			
	<u>TANKS</u>	<u>INSTALLED</u>	<u>CAPACITY</u>
CURRENT:	1	03-83	500
REMOVED:			
PERMANENT:			
UNKNOWN:			
TEMP:			
CLOSED:			
PRODUCT STORED: UNSPECIFIED DIESEL			

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB: RCF8338G

REGISTERED UNDERGROUND STORAGE TANKS			
SEARCH ID: 32	DIST/DIR: 0.03 NE	MAP ID: 10	
NAME: CUMBERLAND FARMS, INC. ADDRESS: 2064 SMITH ST NORTH PROVIDENCE RI 02911		REV: 2/19/01 ID1: 00771 ID2: STATUS: PHONE:	
CONTACT:			
	<u>TANKS</u>	<u>INSTALLED</u>	<u>CAPACITY</u>
CURRENT:	3	04-83	7,622
REMOVED:			
PERMANENT:			
UNKNOWN:			
TEMP:			
CLOSED:			
PRODUCT STORED: UNSPECIFIED GASOLINE			

REGISTERED UNDERGROUND STORAGE TANKS			
SEARCH ID: 33	DIST/DIR: 0.22 NW	MAP ID: 26	
NAME: DIPIETRO S SERVICE CENTER ADDRESS: 31 PUTNAM PIKE JOHNSTON RI 02919		REV: 2/19/01 ID1: 01748 ID2: STATUS: PHONE:	
CONTACT:			
	<u>TANKS</u>	<u>INSTALLED</u>	<u>CAPACITY</u>
CURRENT:			
REMOVED:	5	04-51	500-3,000
PERMANENT:			
UNKNOWN:			
TEMP:			
CLOSED:			
PRODUCT STORED: UNSPECIFIED GASOLINE,WASTE OIL,#2 FUEL/HOME HEATING OIL			

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

REGISTERED UNDERGROUND STORAGE TANKS			
SEARCH ID: 34	DIST/DIR: 0.12 NW	MAP ID: 3	
NAME: EVANS PLATING CORP. ADDRESS: 2 PUTNAM AVE JOHNSTON RI 02919		REV: 2/19/01 ID1: 02307 ID2: STATUS: PHONE:	
CONTACT:			
	<u>TANKS</u>	<u>INSTALLED</u>	<u>CAPACITY</u>
CURRENT:			
REMOVED:	1	05-75	4,000
PERMANENT:			
UNKNOWN:			
TEMP:			
CLOSED:			
PRODUCT STORED: #2 FUEL OIL/HOME HEATING OIL			

REGISTERED UNDERGROUND STORAGE TANKS			
SEARCH ID: 35	DIST/DIR: 0.03 SE	MAP ID: 28	
NAME: MILTON SWEET ESTATE, INC. ADDRESS: 2060-2062 SMITH STREET PROVIDENCE RI 02911		REV: 2/19/01 ID1: 17259 ID2: STATUS: PHONE:	
CONTACT:			
	<u>TANKS</u>	<u>INSTALLED</u>	<u>CAPACITY</u>
CURRENT:			
REMOVED:	3	99-99	500-1,000
PERMANENT:			
UNKNOWN:			
TEMP:			
CLOSED:			
PRODUCT STORED: #2 FUEL OIL/HOME HEATING OIL			

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB: RCF8338G

REGISTERED UNDERGROUND STORAGE TANKS			
SEARCH ID: 36	DIST/DIR: 0.23 NE	MAP ID: 29	
NAME: NEW ENGLAND TELEPHONE ADDRESS: 2194 MINERAL SPRING AVE NORTH PROVIDENCE RI 02911		REV: 2/19/01 ID1: 01189 ID2: STATUS: PHONE:	
CONTACT:			
	<u>TANKS</u>	<u>INSTALLED</u>	<u>CAPACITY</u>
CURRENT:	1	12-95	1,000
REMOVED:	2	99-99	1,000-2,000
PERMANENT:			
UNKNOWN:			
TEMP:			
CLOSED:			
PRODUCT STORED: #2 FUEL OIL/HOME HEATING OIL, UNSPECIFIED DIESEL			

REGISTERED UNDERGROUND STORAGE TANKS			
SEARCH ID: 37	DIST/DIR: 0.09 SE	MAP ID: 30	
NAME: ROBBIN FUNERAL HOME ADDRESS: 2251 MINERAL SPRING AVENUE NORTH PROVIDENCE RI 02911		REV: 2/19/01 ID1: 15742 ID2: STATUS: PHONE:	
CONTACT:			
	<u>TANKS</u>	<u>INSTALLED</u>	<u>CAPACITY</u>
CURRENT:			
REMOVED:	1	99-99	10,000
PERMANENT:			
UNKNOWN:			
TEMP:			
CLOSED:			
PRODUCT STORED: #2 FUEL OIL/HOME HEATING OIL			

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB: RCF8338G

REGISTERED UNDERGROUND STORAGE TANKS			
SEARCH ID: 38	DIST/DIR: 0.25 SE	MAP ID: 31	
NAME: STATE OF RI/E-911 EMER TELE SYS ADDRESS: 1951 SMITH STREET NORTH PROVIDENCE RI 02911		REV: 2/19/01 ID1: 16503 ID2: STATUS: PHONE:	
CONTACT:			
	<u>TANKS</u>	<u>INSTALLED</u>	<u>CAPACITY</u>
CURRENT:			
REMOVED:	1	99-99	10,000
PERMANENT:			
UNKNOWN:			
TEMP:			
CLOSED:			
PRODUCT STORED: #2 FUEL OIL/HOME HEATING OIL			

REGISTERED UNDERGROUND STORAGE TANKS			
SEARCH ID: 39	DIST/DIR: 0.16 NW	MAP ID: 9	
NAME: TOWN LINE FRUIT ADDRESS: 25 PUTNAM PIKE JOHNSTON RI 02919		REV: 2/19/01 ID1: 16623 ID2: STATUS: PHONE:	
CONTACT:			
	<u>TANKS</u>	<u>INSTALLED</u>	<u>CAPACITY</u>
CURRENT:			
REMOVED:	4	99-99	500-6,000
PERMANENT:			
UNKNOWN:			
TEMP:			
CLOSED:			
PRODUCT STORED: WASTE OIL, UNSPECIFIED GASOLINE			

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB: RCF8338G

REGISTERED UNDERGROUND STORAGE TANKS			
SEARCH ID: 40	DIST/DIR: 0.23 SE	MAP ID: 32	
NAME: WILLY S GARAGE	REV: 2/19/01		
ADDRESS: 1954 SMITH STREET PROVIDENCE RI 02911	ID1: 00140		
	ID2:		
CONTACT:	STATUS:		
	PHONE:		
	<u>TANKS</u>	<u>INSTALLED</u>	<u>CAPACITY</u>
CURRENT:	7	03-73	275 - 3,000
REMOVED:			
PERMANENT:			
UNKNOWN:			
TEMP:			
CLOSED:			
PRODUCT STORED: LEADED/UNLEADED GASOLINE, WASTE OIL, UNSPECIFIED GASOLINE			

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

RCRA GENERATOR SITE

SEARCH ID: 49

DIST/DIR: NON GC

MAP ID:

NAME: DAVE S HUB & DIE ETCHING
ADDRESS: 146B WATERMAN AVE
NORTH RI 02911

REV: 1/14/02
ID1: RJR000500959
ID2:
STATUS: SGN
PHONE: 4015789569

CONTACT: DAVID DUARTE

SITE INFORMATION

CONTACT INFORMATION: DAVID DUARTE
HUB&DIE ETCHING
146B WATERMAN AVE
NORTH PROVIDENCE RI 02911

PHONE: 4015789569

UNIVERSE NAME:

SGN: GENERATES 100 - 1000 KG/MONTH OF HAZARDOUS WASTE

SIC INFORMATION:

ENFORCEMENT INFORMATION:

VIOLATION INFORMATION:

*Environmental FirstSearch
Site Detail Report*

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

STATE SITE			
SEARCH ID: 61	DIST/DIR: NON GC	MAP ID:	
NAME: NARR. BAY COMMISSION INTERCEPTOR	REV: 1/9/02		
ADDRESS: GREENVILLE, LYMAN, NEWMAN, DYE JOHNSTON RI 02919	ID1: NBCJ-HWM		
	ID2:		
CONTACT:	STATUS: ACTIVE		
	PHONE:		
<u>SITE INFORMATION</u>			
PROJECT DATE:	12/05/97		

**Environmental FirstSearch
Site Detail Report**

TARGET SITE: 2064 SMITH ST
NORTH PROVIDENCE RI 02911

JOB:
RCF8338G

REGISTERED UNDERGROUND STORAGE TANKS		
SEARCH ID: 64	DIST/DIR: NON GC	MAP ID:
NAME: B MACERONI & SONS FUNERAL HOME ADDRESS: 1382 SMITH ST NORTH PROVIDENCE RI		REV: 2/19/01 ID1: 18842 ID2: STATUS: PHONE:
CONTACT:		
	<u>TANKS</u>	<u>INSTALLED</u>
CURRENT:		<u>CAPACITY</u>
REMOVED:		
PERMANENT:	1	1,000
UNKNOWN:		
TEMP:		
CLOSED:		
PRODUCT STORED: HEATING OIL		

**Environmental FirstSearch
Federal Databases and Sources**

1. **NPL: National Priority List.** The EPA's list of confirmed or proposed Superfund sites. Source: Environmental Protection Agency.

Updated quarterly.

2. **CERCLIS: Comprehensive Environmental Response Compensation and Liability Information System.** The EPA's database of current and potential Superfund sites currently or previously under investigation. Source: Environmental Protection Agency.

Updated quarterly.

3. **RCRIS: Resource Conservation and Recovery Information System.** The EPA's database of registered hazardous waste generators and treatment, storage and disposal facilities. Included are RAATS (RCRA Administrative Action Tracking System) and CMEL (Compliance Monitoring & Enforcement List). Source: Environmental Protection Agency.

Updated quarterly.

4. **ERNS: Emergency Response Notification System.** The EPA's database of emergency response actions. Source: Environmental Protection Agency.

Updated quarterly.

5. **NPDES: National Pollution Discharge Elimination System.** The EPA's database of all permitted facilities receiving and discharging effluents. Source: Environmental Protection Agency.

Updated semi-annually.

6. **FINDS: The Facility Index System.** The EPA's Index of identification numbers associated with a property or facility which the EPA has investigated or has been made aware of in conjunction with various regulatory programs. Each record indicates the EPA office that may have files on the site or facility. Source: Environmental Protection Agency.

Updated semi-annually.

7. **TRIS: Toxic Release Inventory System.** The EPA's database of all facilities that have had or may be prone to toxic material releases. Source: Environmental Protection Agency.

Updated semi-annually.

8. **ACEC: Areas of Critical Environmental Concern.** This database contains contact information for threatened and endangered species. Source: U.S. Fish and Wildlife Services, Ecological Services Offices; State GIS Departments.

Updated periodically.

9. **Floodplains** - 100 year and 500 year flood zone boundaries for select counties in the United States. Source: Federal Emergency Management Agency (FEMA).

This database will be updated by us as new data becomes available for purchase.

10. **Historic Sites-** National Register of Historical Places Database. The nation's official list of cultural resources worthy of preservation. Properties listed include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. Source: National Park Service.

Updated yearly.

11. **Wetlands** - U.S. Fish and Wildlife Service produces information on the characteristics, extent, and status of the Nation's wetlands and deepwater habitats. This data is available for select areas of the United States. Source: U.S. Fish and Wildlife Service, National Wetlands Inventory.

This database will be updated by us as new data becomes available for purchase.

12. **Land Use** - Federal Land data includes information from the following government agencies including Bureau of Indian Affairs, Bureau of Reclamation, Bureau of Land Management, Department of Defense, Forest Service, Fish and Wildlife Service, National Park Service, and the Tennessee Valley Authority. This database also contains data regarding wild and scenic rivers. Source: USGS.

Updated periodically.

Environmental FirstSearch
Rhode Island Databases and Sources

1. **Spills:** The RI Department of Environmental Management's list of Oil and Chemical Spills produced by the Division of Site Remediation.

Updated quarterly.

2. **Landfills:** The RI Department of Environmental Management's listing of Solid Waste Management Facilities maintained by the Division of Waste Management.

Updated annually.

3. **UST:** Underground Storage Tanks. The RI Department of Environmental Management's database listing of the Underground Storage Tanks Facility Master List maintained by the Underground Storage Tank Section of the Division of Waste Management.

Updated quarterly.

4. **PWS:** Public Water Supplies. The RI Department of Administration's database of public water supply locations maintained by the Division of Planning/RIGIS.

Updated annually.

Environmental FirstSearch
Street Name Report for Streets within 1 Mile(s) of Target Property

TARGET SITE: 2064 SMITH ST

JOB: RCF8338G

NORTH PROVIDENCE RI 02911

Street Name	Dist/Dir	Street Name	Dist/Dir
4th St	0.42 NE	Lori Dr	0.71 NE
Abner St	1.00 NW	Lynn Ave	0.85 SE
Acorn St	0.82 SW	Mabel St	0.88 NW
Adams St	0.73 NW	Manning St	0.88 SE
Ahwahnee Ave	0.92 NE	Maple St	0.76 SE
Aldrich St	0.29 SE	Marietta St	0.60 SE
Alfred Ave	0.67 NW	Marvell Dr	0.93 NE
Alfred Dr	0.91 SE	Mathewson St	0.46 NW
Allen Ave	0.53 SE	McArthur Dr	0.69 SE
Allendale Ave	0.55 SE	McGuire Rd	0.80 NE
Amber St	0.15 SW	Meadow Ct	0.87 NW
Angell Ave	0.18 SE	Meadow View Blvd	0.99 NE
Angell St	0.57 NW	Merchant St	0.80 SE
Ash Ln	0.57 NE	Merritt Ave	0.92 SE
Astor Rd	0.79 NW	Middle St	0.35 NE
Atlantic Blvd	0.59 SE	Miles Ave	0.83 SE
Atwells Ave	0.68 SW	Mill St	0.07 SE
Audrey St	1.00 SW	Millard Ave	0.74 SE
Autumn Ave	0.83 NW	Milton St	0.39 SW
Barbara Ann Dr	0.50 NE	Mineral Spring Ave	0.06 SE
Barker Ave	0.78 NE	Minoru St	0.96 NW
Beckside Rd	0.64 NW	Morgan Ave	0.16 NE
Beldon Ave	0.95 SE	Morton Ave	0.52 NW
Berwick Ave	0.46 NE	Mowry Ave	0.96 NW
Beverly Ann Dr	0.74 SE	Muriel Ave	0.31 NE
Bicentennial Way	0.50 NE	Murphy Ct	0.35 NE
Birch Ave	0.77 SE	N Elmore Ave	0.44 NW
Blueberry Ln	0.88 NW	N Howard Ave	0.64 NE
Bourne Ave	0.46 NE	N View Ter	0.43 NE
Bowen St	0.72 SW	Nelson St	0.64 NW
Bradford St	0.31 SW	Norma St	0.81 NW
Brae St	0.69 SE	NORTH Elmore Ave	0.44 NW
Brayton St	0.14 SW	NORTH Howard Ave	0.64 NE
Brenda Dr	0.81 SW	North St	0.21 SW
Brookside Ave	0.51 NE	NORTH View Ter	0.43 NE
Brown Ave	0.38 SE	Oak St	0.78 SE
Buchanan St	0.35 NW	Oakhurst Ave	0.34 NW
Bye St	0.16 NE	Oakleigh Ave	0.55 NW
Byron St	0.43 SE	Oakwood Dr	0.59 SE
Camille Dr	0.39 SW	Olde Clarke Rd	0.97 NW
Carmine Dr	0.44 SE	Olympia Ave	0.58 SE
Carol Ann Cir	0.73 SE	Oregon Ave	0.86 SE
Carol Ann Dr	0.66 SE	Overlook Ave	0.21 SW
Cedar St	0.73 NE	Pasco Dr	0.24 SW
Centerdale Ave	0.28 SE	Peach Hill Ave	0.48 SE
Centerdale Byp	0.02 NW	Pensaukee Ave	0.99 NE
Central Ave	0.73 NE	Phillips St	0.58 NW
Century Cir	0.65 NE	Pine Hill Ave	0.67 NW

Environmental FirstSearch
Street Name Report for Streets within 1 Mile(s) of Target Property

TARGET SITE: 2064 SMITH ST

JOB: RCF8338G

NORTH PROVIDENCE RI 02911

Street Name	Dist/Dir	Street Name	Dist/Dir
Chandler St	0.64 SE	Pine St	0.43 SE
Charlene Dr	0.83 NE	Pleasant Ave	0.67 NE
Charles Ave	0.24 NW	Polk St	0.46 SE
Charles St	0.30 NW	Polly Dr	0.69 NE
Chestnut St	0.41 NW	Prentice St	0.63 SE
Church St	0.43 NW	Progress Ave	0.64 SE
Cindy Cir	0.67 SW	Prospect St	0.96 NW
Clark St	0.18 NE	Putnam Pike	0.11 NW
Clemence Ln	0.76 SW	Railroad Ave	0.38 SE
Cold Spring Ave	1.00 SE	Raymond Ave	0.59 NE
Collins St	0.48 NW	Redfern St	0.19 SE
Colony Dr	0.42 SW	Reynolds Ave	0.59 NE
Columbus Ave	0.86 SE	Rhode Island Ave	0.22 SW
Commodore Ave	1.00 NW	Rice St	0.90 SE
Contillo Dr	0.89 SW	Rici Dr	0.83 SE
Cora St	0.20 NE	Riverside Ave	0.59 NW
Cottage Ave	0.91 NE	Riverview Dr	0.96 NE
Cottage St	0.56 NW	Robert Dr	0.88 NE
Cove Ct	0.49 NE	Rockwell Ave	0.78 SE
Craige St	0.40 NW	Roma Ave	0.27 SW
Cross St	0.18 NE	Ronnie Dr	0.45 NE
Cynthia Dr	0.95 SE	Roosevelt Ave	0.69 NW
Cypress Ct	0.64 NE	Ryan Ln	0.37 NE
Dambria Dr	0.90 NE	S Brookside Ave	0.51 NE
Dambria St	0.90 NE	S Larchmont St	0.55 NW
Dart St	0.73 SW	S Locust Ave	0.54 NE
David Dr	0.79 SW	S Pleasant St	0.67 NE
Dean Ave	0.67 NW	Saint Johns Cir	0.52 NE
Derby Ave	0.27 SW	Sampson Ave	0.90 SE
Dewey Ave	0.58 SE	San Giovanni Dr	0.24 NW
Dexter St	0.86 SE	Savin St	0.37 NE
Di Gulio Dr	0.38 NE	Savoy St	0.36 NW
Doyle Dr	1.00 NE	Sawin Ave	0.34 NW
Earl St	0.74 NW	Scenery Ln	0.80 NW
East Ave	0.33 SE	School St	0.92 NW
Eddy St	0.19 NE	Serrel Sweet Rd	0.19 SW
Edna St	0.17 SW	Sherri Dr	0.82 NE
Elizabeth Dr	1.00 NE	Sherwood Ave	0.52 NE
Elmore Ave	0.31 NE	Sherwood Pl	0.35 NW
Emily St	0.57 NW	Simpson St	0.80 SE
Ester Dr	0.53 NE	Smith St	0.01 NE
Falco St	0.96 SE	Smithfield Rd	0.96 NE
Fenway St	0.51 SE	SOUTH Brookside Ave	0.51 NE
Ferncliff Ave	0.38 SE	SOUTH Larchmont St	0.55 NW
Forest Hill Dr	0.38 NW	SOUTH Locust Ave	0.54 NE
Forest St	0.12 NE	SOUTH Pleasant St	0.67 NE
Foxtail Dr	0.77 NW	South St	0.23 SW
Gainer Ave	0.67 SE	St James Ct	0.93 NE

Environmental FirstSearch
Street Name Report for Streets within 1 Mile(s) of Target Property

TARGET SITE: 2064 SMITH ST

JOB: RCF8338G

NORTH PROVIDENCE RI 02911

Street Name	Dist/Dir	Street Name	Dist/Dir
Gano Ave	0.29 SW	St James Pl	0.94 NE
Garibaldi St	0.94 SE	St Marys Rd	0.55 NW
Garner Ave	0.63 SW	Standish Ave	0.78 SE
Gaudet St	0.64 SE	Steere Ave	0.12 SE
George St	0.24 SE	Steere St	0.52 NW
George Waterman Rd	0.16 NW	Stella Dr	0.35 NE
Gladstone St	0.86 NW	Stephanie Dr	1.00 NE
Grant St	0.51 SE	Stevens St	0.28 SE
Green Valley Dr	0.83 SW	Sunset Ave	0.88 SE
Greenfield Ave	0.82 SE	Swan St	0.12 SW
Greenville Ave	1.00 SW	Sweet Hill Dr	0.66 SW
Greystone Ave	0.57 NW	Sweet St	0.21 NE
Grove Ave	0.97 SE	Sykes St	0.84 SE
Grove St	0.28 SW	Sylvier St	0.80 SE
Grover St	0.16 SE	Tabor Dr	0.43 SW
Guidone St	0.39 SE	Tall Oak Ct	0.65 NW
Halsey St	0.36 SE	Taunton Ave	0.17 NW
Harris Ave	0.24 SW	Taylor St	0.76 SE
Hatherly St	0.62 SE	Teakwood Dr	0.48 SW
Hawkins Blvd	0.94 SE	Thomas St	0.17 SE
Hayes Ave	0.56 SE	Tippling Rock Rd	0.77 SW
Hebdeen St	0.80 NW	Towanda Dr	0.95 NE
Helen St	0.21 NW	Trieste St	1.00 SE
Hersey St	0.57 NW	Vacca St	0.09 SW
Highland Ave	0.63 SW	Van Buren St	0.58 SW
Hill St	0.11 NE	Vesuvius St	0.83 SE
Hobson Ave	0.58 SE	Victor St	0.95 SE
Homestead St	0.96 NW	Villa Ave	0.93 NW
Howard Ave	0.64 NE	Villa Dr	0.77 SE
Howe St	0.65 SE	Vine St	0.68 S-
Intervale Ave	0.94 SE	Vineland Ave	0.43 NE
Jacksonia Dr	0.28 NE	Vinton St	0.34 SW
Jared Ct	0.66 SE	W View Ave	0.92 SE
Jenckes St	0.40 NW	Walter Ave	0.19 NE
Jennifer Dr	0.97 SW	Warren Ave	0.90 SE
Jenny Dr	0.65 SE	Warren St	0.44 NW
Jessica Cir	0.35 NE	Wasiota Ave	0.95 NE
Joan Dr	0.91 SW	Waterman Ave	0.02 NE
Johnson Ave	0.73 NW	Welcome Rd	1.00 NW
Joslin St	0.30 NE	Wendi Dr	0.80 NE
Joyce Dr	0.83 NE	West Larchmont Ave	0.66 NW
Julia Dr	0.65 NE	WEST View Ave	0.92 SE
Junction St	0.34 NE	Whipple Ave	0.70 SE
Justice St	0.83 SE	Whipple Ct	0.74 SE
Karen Dr	0.65 NE	Whipple St	0.81 SE
Kenton Dr	0.87 NW	White Ct	0.76 SE
Kimberly Ct	0.73 NW	Willern St	0.67 NW
King St	1.00 SE	Woodcliffe Ave	0.31 NW

Environmental FirstSearch
Street Name Report for Streets within 1 Mile(s) of Target Property

TARGET SITE: 2064 SMITH ST

JOB:
RCF8338G

NORTH PROVIDENCE RI 02911

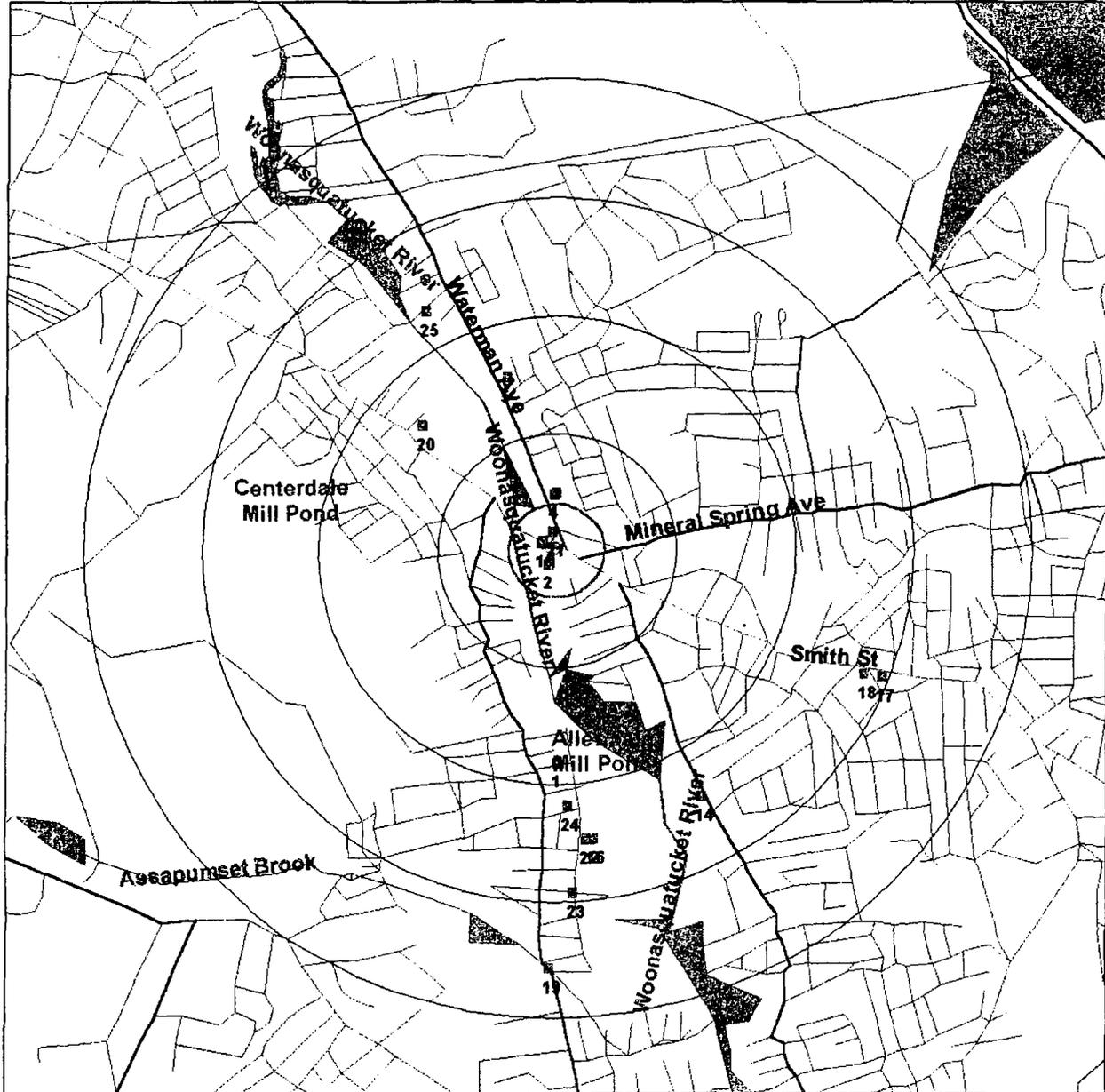
Street Name	Dist/Dir	Street Name	Dist/Dir
La Bonte Rd	0.26 NW	Woodhaven Blvd	0.42 NW
Langsberries Ave	0.62 NW	Woodland Ave	0.88 NW
Lantagne Ave	0.95 SE	Woodlawn Ave	0.52 NE
Larchmont Ave	0.63 NW	Woonasquatucket Ave	0.15 SE
Lawnacre Dr	0.60 NE	Wright St	0.11 NE
Lee Ave	0.75 SE	Wychwood Pl	0.19 SW
Lincoln St	0.26 SE	Zambarano Ave	0.94 SE
Linden St	0.36 SW	Zipporah St	0.78 SE
Locust Ave	0.55 NE	Zoar St	0.36 NE
Loomis St	0.81 NW		



Environmental FirstSearch
 1 Mile Radius
 ASTM Map: NPL, RCRA COR, STATE Sites

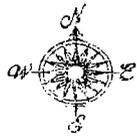


2061 SMITH ST. NORTH PROVIDENCE RI 02911



Source: 1999 U.S. Census TIGER Files

- Target Site (Latitude: 41.858176 Longitude: -71.485824)
- Identified Site, Multiple Sites, Receptor
- NPL, Solid Waste Landfill (SWL) or Hazardous Waste
- Railroads
- Black Rings Represent 1/4 Mile Radii; Red Ring Represents 1/2 Mile



Environmental FirstSearch

.5 Mile Radius
ASTM Map: CERCLIS, RCRATSD, LUST, SWL



2064 SMITH ST, NORTH PROVIDENCE RI 02911



Source: 1999 U.S. Census TIGER Files

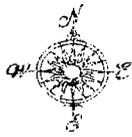
Target Site (Latitude: 41.858176 Longitude: -71.485824)

Identified Site, Multiple Sites, Receptor

NPL, Solid Waste Landfill (SWL) or Hazardous Waste

Railroads

Black Rings Represent 1/4 Mile Radii: Red Ring Represents 500 ft. Radius



Environmental FirstSearch

.25 Mile Radius

ASTM Map: RCRAGEN, ERNS, UST

Environmental
FIRSTSEARCH



2064 SMITH ST, NORTH PROVIDENCE RI 02891



Source: 1999 U.S. Census TIGER Files

Target Site (Latitude: 41.858176 Longitude: -71.485824)

Identified Site, Multiple Sites, Receptor

NPL, Solid Waste Landfill (SWL) or Hazardous Waste

Railroads

Black Rings Represent 1/4 Mile Radii; Red Rings Represent 500 Ft. Radius

FINAL SITE INSPECTION PRIORITIZATION REPORT
FOR
CENTREDALE MANOR
NORTH PROVIDENCE, RHODE ISLAND

CERCLIS No. RID981203755
TDD No. 9409-57-CWX
Delivery Order No. 0002

Prepared by:

Roy F. Weston, Inc.
67 Batterymarch Street
Boston, Massachusetts 02110

May 16, 1997

ROY F. WESTON, INC.
Reviewed and Approved:

 Foie: James Chow
Task Manager Date 5/14/97


Delivery Order Manager Date 5/16/97
(or designee)


QA Review Date 16 MAY 97

Work Order No. 10971-002-053-0007

REMEDIAL SITE ASSESSMENT DECISION - EPA NEW ENGLAND

Site Name: Centredale Manor EPA ID#: RID981203755

Address: Route 44 City: North Providence State: RI

Refer to Report Dated: May 16, 1997 Report type: Site Inspection Prioritization

Report developed by: WESTON

DECISION:

1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:

1a. Site does not qualify for further remedial site assessment under CERCLA
(No Further Remedial Action Planned - NFRAP)

1b. Site may qualify for further action, but is deferred to: RCRA
 NRC

2. Further Assessment Needed Under CERCLA:

2a. (optional) Priority: Higher Lower

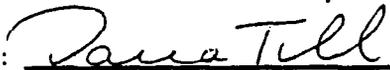
2b. Activity Type: PA
 SI

ESI
 HRS evaluation

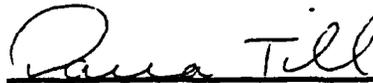
Other: _____

DISCUSSION/RATIONALE: Observed release to the surface water pathway. Many of the elements and compounds detected in sediment samples were also previously detected in soil samples above reference concentrations and in samples collected from drums removed in 1982.

Report Reviewed and Approved by:

Daria Till Signature:  Date: 06/23/97

Site Decision Made by:

Daria Till Signature:  Date: 06/23/97

DISCLAIMER

This report was prepared solely for the use and benefit of the U.S. Environmental Protection Agency Region I (EPA Region I) Office of Site Remediation and Restoration for the specific purposes set forth in the contract between the U.S. Army Corps of Engineers New England Division and Roy F. Weston, Inc. (WESTON®). Professional services performed and reports generated by WESTON have been prepared for EPA Region I purposes as described in the contract. The information, statements, and conclusions contained in the report were prepared in accordance with the statement of work, and contract terms and conditions. The report may be subject to differing interpretations or misinterpretation by third parties who did not participate in the planning, research or consultation processes. Any use of this document or the information contained herein by persons or entities other than the EPA Region I shall be at the sole risk and liability of said person or entity. WESTON therefore expressly disclaims any liability to persons other than the EPA Region I who may use or rely upon this report in any way or for any purpose.

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
INTRODUCTION	1
SITE DESCRIPTION	1
OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS	5
WASTE/SOURCE SAMPLING	9
GROUNDWATER PATHWAY	12
SURFACE WATER PATHWAY	14
SOIL EXPOSURE PATHWAY	22
AIR PATHWAY	23
SUMMARY	24
 REFERENCES	
ATTACHMENT A - CENTREDALE MANOR - SOIL SAMPLE ANALYTICAL RESULTS NUS CORPORATION FIELD INVESTIGATION TEAM Samples collected March 27, 1990	A-1
ATTACHMENT B - CENTREDALE MANOR - SEDIMENT SAMPLE ANALYTICAL RESULTS ROY F. WESTON, INC. Samples collected March 27, 1996	B-1

LIST OF FIGURES

<u>Figure No.</u>	<u>Title</u>	<u>Page</u>
1	Location Map	2
2	Site Sketch	4
3	Surface Water Migration Route	15

LIST OF TABLES

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
1	Source Evaluation for Centredale Manor	8
2	Summary of Hazardous Waste Quantity for Centredale Manor	8
3	Summary of Analytical Results: Soil Sample Analyses for Centredale Manor, Samples Collected by NUS/FIT on March 27, 1990	10
4	Public Groundwater Supply Sources within Four Miles of Centredale Manor	13
5	Estimated Drinking Water Populations Served by Groundwater Sources within Four Miles of Centredale Manor	14
6	Water Bodies Along the 15-Mile Downstream Pathway from Centredale Manor	16
7	Sediment Sample Summary: Centredale Manor, Samples Collected by WESTON on March 27, 1996	17
8	Summary of Analytical Results: Sediment Sample Analyses for Centredale Manor, Samples Collected by WESTON on March 27, 1996	19
9	Estimated Population within Four Miles of Centredale Manor	23
10	Sensitive Environments within Four Radial Miles of Centredale Manor	24

INTRODUCTION

Roy F. Weston, Inc. (WESTON®) was requested by the U. S. Environmental Protection Agency Region I (EPA Region I) Office of Site Remediation and Restoration to perform a Site Inspection Prioritization (SIP) of the Centredale Manor property in North Providence, Rhode Island. Tasks were conducted in accordance with the SIP scope of work and technical specifications provided by EPA Region I. A Screening Site Inspection (SSI) Report for the Centredale Manor property was completed by the NUS Corporation Field Investigation Team (NUS/FIT) on October 15, 1990. Samples collected by NUS/FIT detected organic and inorganic substances in on-site source areas and in sediments along nearby water bodies. The SSI also identified the potential for residents on the property to have direct contact with on-site source areas. On the basis of the information provided in the SSI Report, the Centredale Manor SIP was initiated.

Background information used in the generation of this report was obtained through file searches conducted at EPA Region I and the Rhode Island Department of Environmental Management (RI DEM), telephone interviews with town officials, conversations with persons knowledgeable of the Centredale Manor property and conversations with other Federal, State, and local agencies. Additional information was gathered during the WESTON on-site reconnaissance on October 4, 1995 and environmental sampling on March 27, 1996.

This package follows the guidelines developed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, commonly referred to as Superfund. However, these documents do not necessarily fulfill the requirements of other EPA Region I regulations such as those under the Resource Conservation and Recovery Act (RCRA) or other Federal, State, or local regulations. SIPs are intended to provide a preliminary screening of sites to facilitate EPA Region I's assignment of site priorities. They are limited efforts and are not intended to supersede more detailed investigations.

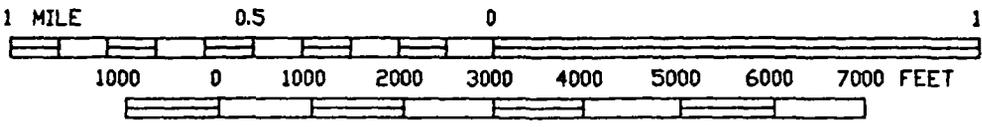
SITE DESCRIPTION

The Centredale Manor property is located at 2074 Smith Street in North Providence, Providence County, Rhode Island at geographic coordinates 41° 51' 29.5" north latitude and 71° 30' 28.5" west longitude (Figure 1) [2]. According to the Town of North Providence Tax Assessor's Office, the 5.24-acre Centredale Manor property is registered as Plat 14, Lot 250 [3].

Note: Text which appears in italics indicates original portions of the Screening Site Inspection Report which were either copied or paraphrased.



BASE MAP IS A PORTION OF THE FOLLOWING U.S.G.S. 7.5 MINUTE QUADRANGLE:
PROVIDENCE, RI 1957, PHOTOREVISED 1975; NORTH SCITUATE, RI, 1955, PHOTOREVISED 1975;
& GEORGIAVILLE, RI 1954, PHOTOREVISED 1975



LOCATION MAP
CENTREDALE MANOR
NORTH PROVIDENCE, RHODE ISLAND



FIGURE 1

P:\DWG\RHC\H\02\CENTREDALE\FIG-1.DWG (PLOT 1=1)

A residential apartment complex, which was constructed in 1982, currently occupies the property (Figure 2). Since March 1995, the property has been owned and managed by the Cornerstone Corporation [1; 7]. The complex is known as Centredale Manor and consists of a single eight-story apartment building with 122 residential units and an office. The footprint of the apartment building occupies approximately 20,000 square feet. No other buildings are located on the property. Paved areas, including two parking lots occupy approximately one-half of the 5.24-acre property. The remaining portions of the property are covered with maintained lawns and trees.

The property is bordered to the north and northeast by Brook Village Apartments; to the east and southeast by a small wooded area, a perennial drainage channel, and a residential neighborhood; to the south by a wooded area; and to the southwest, west, and northwest by the Woonasquatucket River and a residential neighborhood (Figure 2). The drainage channel converges with the Woonasquatucket River approximately 0.2 miles south of the property [1].

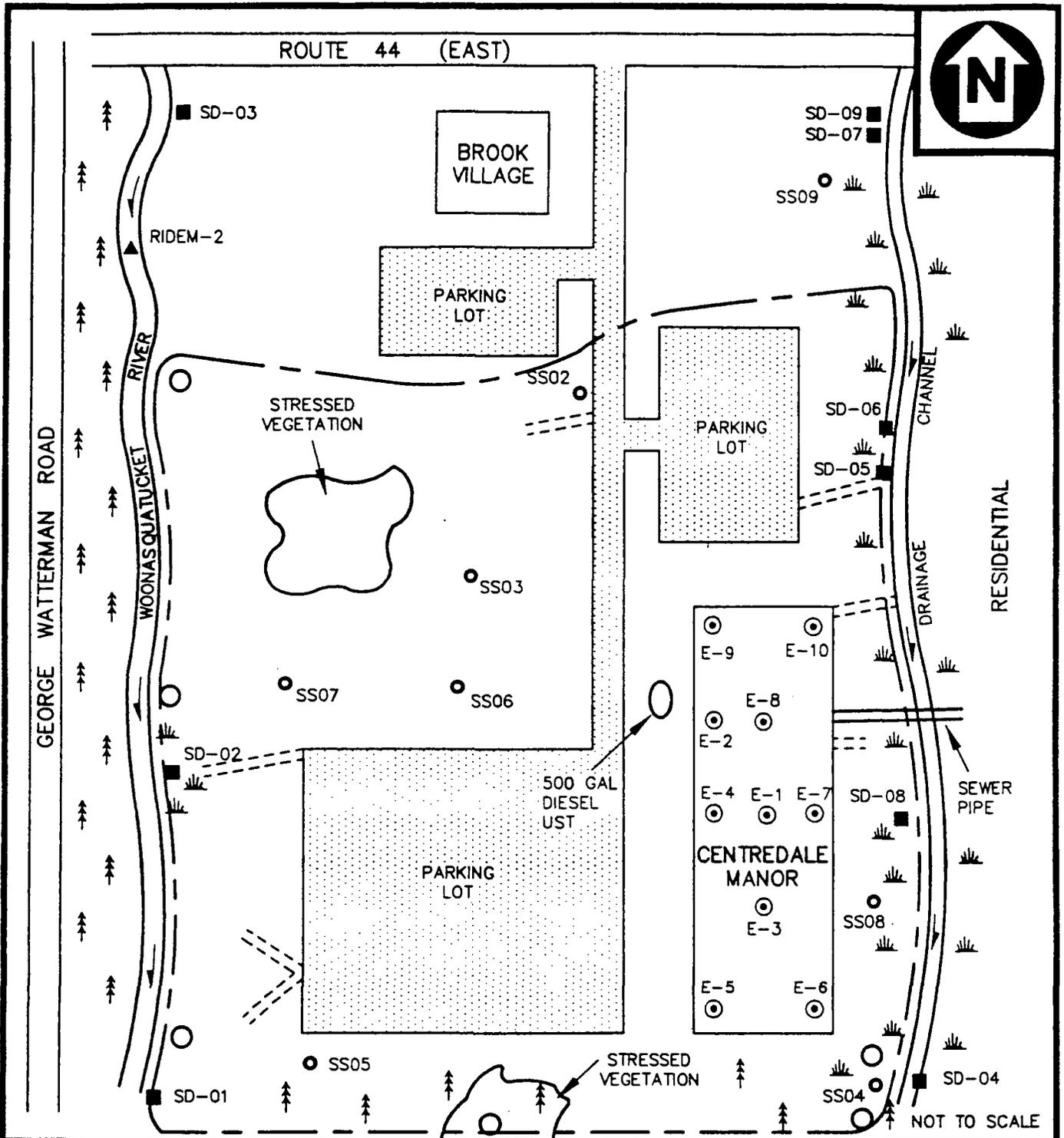
During the October 4, 1995 WESTON on-site reconnaissance, conditions on the property were verified. Vehicular and pedestrian access to the Centredale Manor property is unrestricted. The main access to the property is by a paved driveway shared with Brook Village Apartments (Figure 2). A 500-gallon diesel underground storage tank (UST) is located approximately 100 feet west of the building [1]. During the WESTON on-site reconnaissance, unpaved bicycle trails, walking trails, and children's toys were observed in the wooded area along the southern perimeter of the property [1].

Topography on the property is relatively flat with a downward slope to the east toward the perennial drainage channel. The highest elevation at the property is approximately 200 feet above mean sea level (MSL) in the central portion of the property [1; 4]. Approximately 2,100 feet of wetland frontage is located on the southeast perimeter of the property along the drainage channel. A smaller wetland area, with approximately 50 feet of frontage, is located on the west side of the property along the Woonasquatucket River (Figure 2).

During the WESTON on-site reconnaissance, an area of stressed vegetation measuring 15 feet by 30 feet was observed in the southern portion of the property in a low-lying drainage area along the overland flow route between on-site paved areas and the Woonasquatucket River (Figure 2). A sheen and discolored sediment were observed along a section of the Woonasquatucket River located south of the property boundary [1]. An area of stressed vegetation measuring approximately 450 square feet was also observed on the northwest side of the property between on-site parking areas and a Brook Village Apartment parking lot (Figure 2).

Approximately ten deteriorated 55-gallon drums were observed along the western property boundary along the Woonasquatucket River and in the wooded area located along the southern perimeter of the property (Figure 2). The observed drums were heavily rusted and empty [1].

The nearest verified private well is located approximately 0.12 miles northeast of the property at the Yacht Bottling Company which serves an estimated 1,000 people (Figure 1). The nearest public water well is located approximately 0.8 miles northwest of the property at the Pied Piper Nursery School which serves an estimated 130 people. The nearest residents are the three full-time workers and 135 people who live at the Centredale Manor Apartments [1].



P:\DWG\RHC\ACOE\CENTRE\FIG-2.DWG (PLOT 1=1)

LEGEND

- | | | |
|--------------------------------|--------------------------------------|--------------------|
| SD-01 ■ WESTON SEDIMENT SAMPLE | RIDEM-2 ▲ RIDEM SURFACE WATER SAMPLE | ▲ FLOW DIRECTION |
| E-1 ⊙ GZA SOIL SAMPLE | ○ EMPTY DRUMS | --- PAVED DRAINAGE |
| SS01 ● NUS SOIL SAMPLE | - - - PROPERTY BOUNDARY | ▲ WOODED AREA |
| | | ▲ WETLAND |

SITE SKETCH
CENTREDALE MANOR
NORTH PROVIDENCE, RHODE ISLAND



FIGURE 2

OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS

Since March 1995, the property has been owned and managed by the Cornerstone Corporation [1; 7]. From 1982 to March 1995, the property was owned by Centredale Manor Associates. From 1943 to 1982, the property was owned by Mr. Joseph Buonanna and Mr. Edward Ricci. Prior to 1943, the property was owned by Mr. Henry E. Sweet.

In the 1930s, Centredale Worsted operated a textile mill on the property. No information regarding the exact dates of operation of the Centredale Worsted mill or the types of textile activities conducted at the mill was found in available file information.

From the 1940s to the early 1970s, two chemical companies were located on the property; Crown Chemical Company and Metro-Atlantic Chemical Company. There was no available information in EPA Region I, RI DEM or local agency files concerning operations of the Crown Chemical Company. The Metro-Atlantic Chemical Company operated as a barrel reclamation factory. Additional information regarding operations at the Metro-Atlantic Chemical Company was not found in available file information. Sometime in the mid-1970s, the existing mill building was demolished and the property was razed. No other file information regarding the demolition of the mill building was found.

In October and November 1977, the Rhode Island Department of Health (RI DOH) conducted several investigations at the Centredale Manor property in response to complaints of odors and fumes at the property. Approximately 60, 55-gallon drums were found on the property in a swampy area near the Woonasquatucket River. A bluish white smoke was detected from an unknown number of ruptured drums reportedly containing sulfuric acid. On November 10, 1977, Acme Services removed ten drums from the swampy area which reportedly contained sulfuric acid [10]. No information was available which documented where the drums were transported. The remaining drums were left on the property [10; 37].

From December 1979 to March 1981, RI DEM periodically inspected the property [11; 29; 39; 40; 41; 42; 43]. During these inspections, RI DEM observed and inventoried approximately 400 drums. The drums were reported to be in various stages of deterioration. An unknown number of drums were found to contain residual solid and liquid material. Legible drum labels and visual inspection of residual materials indicated that caustics, halogenated solvents, polychlorinated biphenyls (PCBs), and ink wastes potentially containing heavy metals may have been contained in the drums [43]. During the inspections, approximately 150 drums were observed scattered along the bank of the Woonasquatucket River [11; 43].

In 1981, Marshall Contractors, Inc. (Marshall) and Robinson, Green and Beretta performed a feasibility study for the property owners, Mr. Buonannu and Mr. Ricci, to investigate the potential commercial development of the property as an apartment complex. In October 1981, Marshall reportedly discovered a smoking drum of sulfuric acid [46]. On October 16, 1981, Jet-Line Services, under contract to Marshall, manifested and removed the drum of sulfuric acid to an approved disposal facility [46]. The Jet-Line Services drum removal activities were supervised by Marshall and RI DEM.

A Notice of Violation and Order to the property owners was issued by RI DEM on November 23, 1981 for violations of the State Hazardous Waste Management Act [44]. Violations listed in the RI DEM Notice were as follows: 1) Disposal of hazardous waste in and on the land in violation of State regulations; and 2) Storage of hazardous waste in unlabelled containers in violation of State regulations. As part of the Notice, RI DEM instructed the property owners to immediately identify all on-site hazardous materials by sampling and chemical analyses and to repackage and properly manifest and dispose all hazardous wastes on-site [44].

In February 1982, Marshall was retained by the property owners to oversee the characterization and removal of wastes at the Centredale Manor property; these activities were supervised by RI DEM [45; 47; 48; 49]. On February 2, 1982, Guild Drilling, under contract to Marshall, collected two composite soil samples from ten soil borings advanced in the proposed construction area for the apartment building (Figure 2) [49]. The samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and eight extraction procedure (EP) toxicity metals to determine if soils in the construction area would be considered hazardous waste. Analyses of soil samples indicated the presence of chloroform, toluene, trichloroethylene, bis(2-ethylhexyl)phthalate and barium at concentrations below RI DEM regulatory levels. Six thousand cubic yards of excavated soil were removed during the construction of the apartment building and disposed as non-hazardous solid waste.

On February 22, 1982, C. Pezza and Sons, Inc., under contract to Marshall, excavated and staged approximately 400 drums on the property under the supervision of RI DEM [47]. Drums which were verified to be empty were crushed and sent to a solid waste facility for disposal as non-hazardous waste. Approximately 30 drums with residual materials were stockpiled on the property and sampled on February 27, 1982 [47; 48].

On February 27, 1982, Goldberg, Zoino & Associates, Inc. (GZA), under contract to Marshall and RI DEM collected eight composite samples from drums which contained chemical residues [47; 48]. The drums were categorized, separated, and composited for sampling based on similar contents. Samples were analyzed for VOCs and eight EP toxicity metals [48]. Analyses of the drum samples reported xylene, toluene, ethyl benzene, cadmium, chromium, lead, and silver between 0.21 parts per million (ppm) and 47,000 ppm [48]. Based on these analyses, eight of the 30 drums with residual materials were reported to contain hazardous material. On June 2, 1982, Jet-Line Services transported the eight drums off-site for disposal at an approved facility [18; 48]. The remaining drums were disposed as non-hazardous solid waste [48].

In 1982, construction of the Centredale Manor complex was completed. A Fresh Water Wetland Applicability Determination, required for the construction of the complex, concluded that the construction of Centredale Manor represented an insignificant alteration of the nearby fresh water wetland located on the western side of the property adjacent to the Woonasquatucket River [21].

In 1986, RI DEM received information from the Providence Journal which indicated that several 5,000-gallon USTs used to store hazardous waste were buried at the Centredale Manor property. A ground-penetrating radar survey was conducted by Geo-Centers, Inc. on March 24, 1986, to locate the buried USTs reported at the property. The survey concluded there were no buried USTs on-site; however, other metallic debris, possibly buried drums, may be present along the western edge of the property [12; 13].

A Preliminary Assessment (PA) of the Centredale Manor property was conducted by NUS/FIT on August 21, 1986 [21]. Based on the previous history of the property, NUS/FIT concluded that potentially impacted groundwater, surface water, soil and sediment were present at the property. Based on the findings of the PA, an SSI was recommended [21].

An SSI for Centredale Manor was completed by NUS/FIT on October 15, 1990. On March 27, 1990, NUS/FIT collected ten soil samples, including one trip blank, one duplicate/replicate and one reference sample from the Centredale Manor property (Figure 2). The soil samples were submitted through the EPA Contract Laboratory Program (CLP) for VOC, SVOC, pesticide/PCB and metals analyses. The trip blank was analyzed for VOCs only. A total of six VOCs and twenty-nine SVOCs were detected, including the compound 4-chloroaniline at a concentration of 32,000 parts per billion (ppb). 4-Chloroaniline is commonly found in dyes used in textile mills similar to the one that occupied the property in the 1930s. Four pesticides, the PCB Aroclors 1242 and 1254, and six inorganic elements were also detected in the NUS/FIT soil samples. The analytical results of the NUS/FIT soil samples are discussed in further detail in the Waste/Source Sampling Section of this report. Complete analytical results of NUS/FIT samples are included in Attachment A.

On September 10, 1994, RI DEM collected surface water samples from the Woonasquatucket River. These samples were collected to determine the impact of a cyanide spill which occurred upstream of the property. One sample was collected from the Woonasquatucket River adjacent to the Centredale Manor property (Figure 2). Laboratory analyses detected elevated concentrations of cadmium, copper, cyanide, lead, and nickel between 8 ppb and 250 ppb. No known reference or quality assurance/quality control (QA/QC) samples were collected [14; 15; 16; 17]. The results of the RI DEM surface water sampling event are discussed in further detail in the Surface Water Pathway Section of this report.

On October 4, 1996, WESTON conducted an on-site reconnaissance of the Centredale Manor property. As part of the SIP, on March 27, 1996, WESTON conducted sediment sampling. Nine sediment samples, including three reference samples, were collected from eight locations at the property. Three sediment samples were collected from the Woonasquatucket River and six sediment samples were collected from wetlands along the drainage channel (Figure 2). Analytical results of WESTON samples are discussed in the Surface Water Pathway Section of this report.

There are presently four potential source areas at the Centredale Manor property. These include the 500-gallon diesel fuel UST, fill material located two feet below ground surface (bgs), contaminated surface soil, and the abandoned drums located on the property. There are no other known sources of contamination at the Centredale Manor property [1]. Table 1 presents identified structures or areas on the Centredale Manor property that are documented or potential sources of contamination, the containment factors associated with each source, and the relative location of each source [1; 18].

Table 1

Source Evaluation for Centredale Manor

Source Area	Containment Factors	Spatial Location
500-gallon UST	No known containment factors. The UST is used to store virgin diesel fuel.	100 feet west of on-site building.
Buried Fill Material (Contaminated soil)	No known containment factors. However, the source is buried more than two feet bgs. Source is available to the groundwater and surface water pathways.	Two feet below the present ground surface, potentially throughout the entire property.
Surface Soil (Contaminated soil)	No known containment factors. Contaminated surface soil located beneath paved areas and the building are available to the groundwater and surface water pathways only. Contaminated surface soil in all other areas are available to the groundwater, surface water, soil, and air pathways.	Potentially throughout the entire property. Stressed vegetation areas observed north and south of the apartment building
Drums	No known containment factors. Available to the groundwater, surface water, soil, and air pathways.	Located on the southern and western portions of the property.

Table 2 summarizes the types of potentially hazardous substances which have been disposed, used, or stored on the Centredale Manor property [1; 18].

Table 2

Summary of Hazardous Waste Quantity for Centredale Manor

Substance	Quantity or Volume/Area	Years of Use/Storage	Years of Disposal	Source Area
Unknown residual material	10, 55-gallon drums	1940s - Present	1940s - Present	Drums
VOCs, SVOCs, Pesticides/PCBs, Inorganics	3.5 acres	1940s - Present	unknown	Surface Soil and Fill Material (contaminated soil)

The Centredale Manor property was added to the Comprehensive Environmental Response, Compensation & Liability Act Information System (CERCLIS) on April 10, 1986, based on prior sampling events conducted by RI DEM which documented elevated concentrations of VOCs, SVOCs, and inorganic elements in soil samples collected at the property. No known National Priority List properties are located within one mile of the Centredale Manor property as of July 7, 1995. Six RCRA notifiers are located within a one-mile radius of the Centredale Manor property. These include Barner Philip DR (RID98746985), Bruno David J DR (RID000012419),

Copy World (RID984869090), Cumberland Farms (RID982193740), Getty Service Station (RID987467271), and Gibbons, Robert W. DPM (RID000012120). These properties are located northeast of the Centredale Manor property on Mineral Spring Avenue. There is one other CERCLIS property located in North Providence, Rhode Island, the North Providence Landfill (CERCLIS No. RID981064793) is located on Smithfield Road and is approximately 1.0 mile northeast of the property [19; 20].

WASTE/SOURCE SAMPLING

On February 2, 1982, Guild Drilling collected two composite soil samples from ten soil borings advanced in the proposed construction area for the apartment building (Figure 2) [49]. The samples were analyzed for VOCs, SVOCs, and eight EP toxicity metals to determine if the fill removed would be considered hazardous waste. No reference or QA/QC samples are known to have been collected. Analyses of the composite soil samples detected chloroform (3.4 ppb), toluene (2.6 ppb), trichloroethylene (5.1 ppb), and bis(2-ethylhexyl)phthalate (1.3 ppb). Barium, detected at 0.5 ppm, was the only inorganic substance detected. According to RI DEM, the detected soil concentrations were below regulatory levels and 6,000 cubic yards of fill were eventually removed during the construction of the apartment building and subsequently disposed as non-hazardous solid waste. Residual contaminated fill which was not excavated may potentially remain on-site.

On February 22, 1982, C. Pezza and Sons, Inc. excavated and staged approximately 400 drums on the property under the supervision of RI DEM [47]. Drums which were verified to be empty were crushed and sent to a solid waste facility for disposal as non-hazardous waste. Approximately 30 remaining drums with residual materials were stockpiled on the property for waste characterization [47; 48].

On February 27, 1982, GZA and RI DEM collected eight composite samples from drums which contained chemical residues [47; 48]. The drums were categorized, separated, and composited for sampling based on similar contents. No reference or QA/QC samples are known to have been collected. Samples were analyzed for VOCs and eight EP toxicity metals [48]. Analyses of the drum content samples reported xylene at 47,000 ppm, toluene at 5,500 ppm, ethyl benzene at 7,100 ppm, cadmium at 0.23 ppm, chromium at 0.39 ppm, lead at 3.0 ppm and silver at 0.21 ppm [48]. Based on these analyses, eight of the 30 drums with residual materials were reported to contain hazardous material. On June 2, 1982, Jet-Line Services transported the eight drums off-site for disposal at an approved facility [18; 48]. The remaining drums were disposed as non-hazardous solid waste [48].

On March 27, 1990, as part of the SSI, NUS/FIT collected ten soil samples (SS-01 to SS-09) including one trip blank (SS-01), one duplicate/replicate (SS-08 and SS-08D/R), and one reference sample (SS-09) from the Centredale Manor property (Figure 2). Soil samples were collected from depths ranging from 6 to 18 inches. The soil samples were analyzed through the EPA CLP for VOCs, SVOCs, pesticides, PCBs and inorganic elements. The trip blank was analyzed for VOCs only. Complete analytical results of NUS/FIT samples are included in Attachment A [18].

Table 3 is a summary of organic compounds and inorganic elements detected through EPA CLP analyses of NUS/FIT soil samples. For each sample location, a compound or element is listed if it was detected at three times or greater than the reference sample's concentration (SS-09). However, if the compound or element was not detected in the reference sample, the reference sample's quantitation limit (SQL) (for organic analyses) or detection limit (SDL) (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference sample's SQL or SDL and are designated by their approximate relative concentration above these values.

Table 3

**Summary of Analytical Results: Soil Sample Analyses
for Centredale Manor, Samples Collected by NUS/FIT on March 27, 1990**

Compound/Element	Maximum Sample Concentration	Comments
VOCs		
Benzene	6 J ppb	3 x SQL
2-Butanone	26 ppb	3 x SQL
1,2-Dichloroethene	69 ppb	11 x SQL
Methylene Chloride	11 J ppb	3 x SQL
Tetrachloroethene	360 ppb	60 x SQL
Trichloroethylene	99 ppb	16 x SQL
SVOCs		
2-Methylphenol	130 J ppb	3 x SQL
Benzoic acid	120 J ppb	3 x SQL
Naphthalene	470 J ppb	3 x SQL
2-Methylnaphthalene	850 J ppb	3 x SQL
Acenaphthylene	440 J ppb	3 x SQL
Acenaphthene	1,900 ppb	3 x SQL
Dibenzofuran	1,500 ppb	3 x SQL
Fluorene	3,100 ppb	3 x SQL
Phenanthrene	16,000 ppb	133 x REF
Anthracene	3,300 ppb	4 x SQL
Fluoranthene	11,000 ppb	73 x REF
Pyrene	8,900 J ppb	49 x REF
Benzo(a)anthracene	8,900 ppb	89 REF
Chrysene	7,500 ppb	62 x REF
Benzo(b)fluoranthene	5,400 ppb	6 x SQL
Benzo(k)fluoranthene	11,000 ppb	13 x SQL

Table 3

**Summary of Analytical Results: Soil Sample Analysis
for Centredale Manor, Samples Collected by NUS/FIT on March 27, 1990
(concluded)**

Compound/Element	Maximum Sample Concentration		Comments
Benzo(a)pyrene	6,100	ppb	7 x SQL
Indeno(1,2,3-cd)pyrene	3,500	ppb	4 x SQL
Dibenz(a,h)anthracene	1,300	ppb	3 x SQL
Benzo(g,h,i)perylene	3,900	ppb	4 x SQL
Nitrobenzene	320 J	ppb	3 x SQL
Pentachlorophenol	430 J	ppb	3 x SQL
1,2,4-Trichlorobenzene	290 J	ppb	3 x SQL
4-Chloroaniline	32,000	ppb	39 x SQL
Dimethylphthalate	100 J	ppb	3 x SQL
Di-n-butylphthalate	630 J	ppb	13 x REF
Butylbenzylphthalate	1,100 J	ppb	3 x SQL
Bis(2-ethylhexyl)phthalate	15,000 J	ppb	18 x SQL
2,4,5-Trichlorophenol	990 J	ppb	3 x SQL
PESTICIDES/PCBs			
Dieldrin	2,800 J	ppb	70 x SQL
Endosulfan II	24 J	ppb	3 x SQL
Heptachlor epoxide	370 J	ppb	18 x SQL
4,4'-DDD	1,000 J	ppb	25 x SQL
Aroclor-1242	7,500 J	ppb	8 x REF
Aroclor-1254	25,000 J	ppb	52 x REF
INORGANICS			
Copper	213 J	ppm	9 x REF
Chromium	192 J	ppm	9 x REF
Cadmium	19.3	ppm	8 x SDL
Mercury	2 J	ppm	14 x REF
Sodium	2,600	ppm	4 x REF
Arsenic	11.3	ppm	8 x SDL

REF = Reference sample concentration.

J = Quantitation is approximate due to limitations identified during the quality control review.

Six VOCs and twenty-nine SVOCs were detected in NUS/FIT soil samples, including the compound 4-chloroaniline at a concentration of 32,000 ppb in sample SS-02. 4-Chloroaniline is commonly found in dyes used in textiles mills, similar to the one that occupied the property in the 1930s. Four pesticides, the PCB Aroclors 1242 and 1254, and six inorganic elements were also detected in NUS/FIT samples [18]. Sample concentrations ranged between 1 times the SQL to 133 times the reference sample concentration.

WESTON did not perform waste/source sampling at the Centredale Manor property as part of the SIP as previous sampling and analyses adequately profile known on-site source areas.

GROUNDWATER PATHWAY

The surficial geology beneath the Centredale Manor property consists mainly of fill material which extends to an unknown depth. Shallow overburden borings advanced by Guild Drilling on February 2, 1982 indicate that the native overburden in the vicinity of the property is composed of stratified glacial outwash deposits consisting of fine to coarse sand and silt. Within the Woonasquatucket River Valley, boring logs within 2,000 feet of the property indicate an overburden thickness of 10 to 25 feet.

Bedrock geology beneath the property has been mapped as Quinnville quartzite which is characterized by bluish-gray to light-gray, medium grained, massive to thin settled quartzite with interbedded greenish quartzmica schists. The depth to bedrock in the area varies from 10 to 25 feet. The depth to groundwater was approximately two feet in the areas where fill material was not used. Based on surface topography, the direction of groundwater flow in the overburden is south-southwest toward the Woonasquatucket River. Mean annual precipitation for the Town of North Providence is approximately 46.0 inches [22].

The communities of Smithfield (population 1,900), Lincoln (population 34,000), North Providence (population 32,090), Providence (population 596,270), and Johnston (population 26,800) are located partially or wholly within a four-mile radius of the Centredale Manor property [4; 5; 6; 7].

An estimated 8,130 people are served by private groundwater sources within a four-mile radius of the Centredale Manor property [23]. The nearest private drinking water well is located approximately 0.12 miles northeast of the property at the Yacht Bottling Company which serves an estimated 1,000 customers from a bedrock well [9]. The nearest public water well is located approximately 0.8 miles northwest of the property at the Pied Piper Nursery School which serves an estimated 130 people. Eleven community water supplies are located within four miles of the property and serve an estimated 1,351 people.

Groundwater in the immediate vicinity of the Centredale Manor property is classified as GB [50]. A GB classification indicates groundwater may not be suitable for drinking water use without treatment due to known or presumed degradation [50]. The groundwater in the vicinity of the Yacht Bottling Company Well is classified as GA [50]. Groundwater classified as GA is known or presumed to be suitable for drinking water use without treatment.

Table 4 summarizes public groundwater supply sources located within four-radial miles of the Centredale Manor property [4; 5; 6; 7; 9].

Table 4

Public Groundwater Supply Sources within Four Miles of Centredale Manor

Distance/ Direction from Site	Source Name	Location of Source ^a	Estimated Population Served	Source Type ^b
0.8 miles NW	Pied Piper Nursery School	Johnston	130	unknown
1.5 miles NE	Geneva Sportsman Club	North Providence	25	unknown
2.2 miles NE	Camp Meehan	Lincoln	150	unknown
2.5 miles NW	Smithfield Sportsman Club	Smithfield	150	unknown
3.4 miles NE	Lincoln Woods South Beach	Lincoln	450	unknown
3.4 miles NW	Bonnie & Clydes	Smithfield	25	unknown
3.5 miles NE	Cicerone's Snack	Lincoln	unknown	unknown
3.5 miles NW	Waterman Heights	Smithfield	146	unknown
3.7 miles NW	Camp Shepard YMCA	Smithfield	125	unknown
3.8 miles NW	Nationwide Tractor Trailer School	Smithfield	50	unknown
3.9 miles NW	Ron's Spaghetti House	Smithfield	100	unknown

^a = Indicate Town in which well is located.

^b = Overburden, Bedrock, or Unknown

Private well users within a four-mile radius of the property were estimated using equal distribution calculations of CENTRACTS data identifying populations, households and private water wells for "Block Groups" which lie wholly or in part within individual rings measured radially from potential sources on the property. Attempts were made to verify the information provided by CENTRACTS data through telephone calls to local health and or water departments when possible. Table 5 lists the estimated population receiving drinking water from public and private groundwater sources within a four-mile radius of the Centredale Manor property [4; 5; 6; 22].

Table 5

Estimated Drinking Water Populations Served by
Groundwater Sources within Four Miles of Centredale Manor

Radial Distance from Centredale Manor (miles)	Estimated Population Served by Private Wells	Estimated Population Served by Public Wells	Total Estimated Population Served by Groundwater Sources within the Ring
0.00 < 0.25	1,000	0	1,000
0.25 < 0.50	0	0	0
0.05 < 1.0	440	130	570
1.0 < 2.0	1,131	25	1,156
2.0 < 3.0	2,783	300	3,083
3.0 < 4.0	2,776	896	3,672
TOTAL	8,130	1,351	9,481

No known groundwater sampling has been conducted at the Centredale Manor property [1; 9].

SURFACE WATER PATHWAY

The Centredale Manor property is located in the Woonasquatucket Regional River Basin. An undefined overland flow route exists for precipitation that falls on the property. As a result, run-off from the property travels as sheet flow into either the Woonasquatucket River or the unpaved perennial drainage channel. The most upstream probable points of entry (PPEs) from sheet flow are located at the north corner of the property along the Woonasquatucket River and at the east corner of the property along the unpaved perennial drainage channel (Figure 2). From the drainage channel PPE, the surface water travels approximately 0.1 mile along the southeastern perimeter of the property and converges with the Woonasquatucket River approximately 0.2 miles south of the property [1]. The mean annual flow rate of the drainage channel is estimated to be 5 cubic feet per second (cfs). The drainage channel is not known to be a fishery.

From the Woonasquatucket River PPE, surface water travels approximately 0.1 mile along the northwestern perimeter of the property, reaches the confluence with the drainage channel 0.2 miles south of the property and travels south for approximately 5.7 miles before discharging into the Providence River. The Providence River continues south approximately 8 miles before discharging into the Narragansett Bay. The 15-mile surface water pathway ends approximately 0.7 miles into the Narragansett Bay (Figure 3). The mean annual flow rate of the Woonasquatucket River in the vicinity of the property is estimated at 73 cfs based on historical flow rate information from a gaging station located 0.1 mile north of the property. The flow rates of the Providence River and Narragansett Bay are tidally influenced [4; 5; 7; 24].



SITE

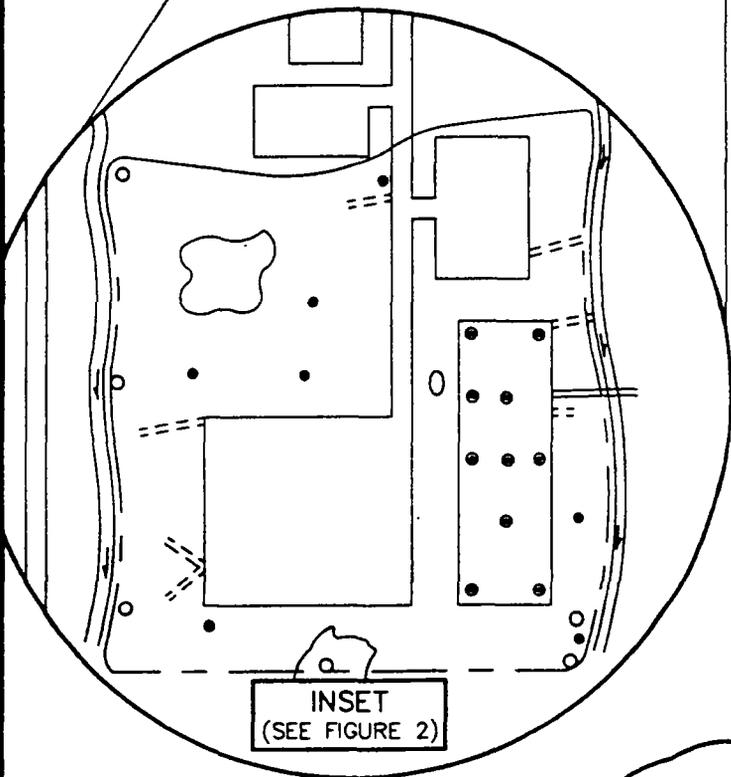
WOONASQUATUCKET RIVER
LOR = 6 MILES
MAF = 73 CFS

PROVIDENCE RIVER
LOR = 8 MILES
MAF = 1,000-10,000 CFS
(TIDAL INFLUENCE)

NARRAGANSETT BAY
LOR = 1 MILE
(TIDAL INFLUENCE)

END OF
SURFACE WATER
PATHWAY EVALUATION

NOT TO SCALE



LEGEND

FISHERY

LOR LENGTH OF REACH

MAF MEAN ANNUAL FLOW

EMPTY DRUMS

GZA SOIL SAMPLE

NUS SOIL SAMPLE

PROPERTY LINE

FLOW DIRECTION

PAVED DRAINAGE

WETLAND

**SURFACE WATER PATHWAY
CENTREDALE MANOR
NORTH PROVIDENCE, RHODE ISLAND**



FIGURE 3

P:\DWG\RHC\ACOE\CENTRE\FIG-3.DWG (PLOT 1=1)

There are also two defined surface water overland flow routes on the property. One defined overland flow route begins from three paved drainage swales located along the southeast edge of the property and drain a paved parking lot and the on-site building. The swales are directed through wetland areas to the unpaved perennial drainage channel (Figure 2) [1]. The second defined overland flow route originates from four paved drainage swales located on the northwest side of the property which drain a paved parking lot. The swales are directed through wetland areas to the Woonasquatucket River (Figure 2). A surface water sheen and sediment discoloration were observed along the Woonasquatucket River adjacent to the property during the WESTON on-site reconnaissance [1]. Table 6 summarizes the characteristics of the water bodies within 15-downstream miles of the Centredale Manor property [4; 5; 6; 7; 24]. Figure 3 depicts the 15-mile downstream surface water pathway from the Centredale Manor property.

Table 6

**Water Bodies Along the 15-mile Downstream Pathway
from Centredale Manor**

Surface Water Body	Descriptor ^a	Length of Reach	Flow Characteristics (cfs) ^b	Length of Wetlands
Perennial drainage channel	Small to moderate stream	0.3 mile	~5	0.4 mile
Woonasquatucket River	Small to moderate stream	6 miles	73	1.0 mile
Providence River	Moderate to large stream	8 miles	tidally influenced	None
Narragansett Bay	Shallow ocean zone	1 mile	tidally influenced	None

^a = Minimal stream. Small to moderate stream. Moderate to large stream. Large stream to river. Very large river. Coastal tidal waters. Shallow ocean zone or Great Lake. Deep ocean zone or Great Lake. Three-mile mixing zone in quiet flowing river.

^b = Cubic feet per second.

No drinking water intakes are located along the surface water pathway. Surface water quality from the PPE to the lower portion of the Providence River is designated as Class SC. Class SC waters are considered waters which are not presently meeting water quality criteria for certain fish and wildlife habits and certain recreational activities due to pollution [26]. The Woonasquatucket River, including portions adjacent to the property, is considered a recreational fishery for the purposes of the SIP. The surface water along the lower portion of the Providence River is considered Class SB and the surface water of Narragansett Bay is considered Class SA. The Providence River and Narragansett Bay, located approximately six and eight miles downstream, respectively, are both considered recreational and commercial fisheries [25].

Surface water bodies downstream of the property are protected under the Clean Water Act. In addition, Narragansett Bay is designated a sensitive environment under the National Estuary Program. Approximately 2,100 feet of wetland frontage is located on the southeast perimeter of the property along the drainage channel. A smaller wetland area, with approximately 50 feet of frontage, is located on the west side of the property along the Woonasquatucket River (Figure 2).

In addition, one mile of wetland frontage is located within a quarter mile of the property along the Woonasquatucket River. There are no other known wetlands located along the 15-mile surface water pathway [1; 4; 5; 6; 7]. No other sensitive environments are known to be located along the 15-mile surface water pathway.

On September 10, 1994, RI DEM collected surface water samples from the Woonasquatucket River. These samples were collected to determine the extent of a cyanide spill which occurred upstream. One sample (RI DEM 2) was collected from the Woonasquatucket River bordering the Centredale Manor property. Sample analyses detected cadmium at 78 ppb (EPA method 213.2), copper at 70 ppb (EPA method 200.7), cyanide at 250 ppb (EPA method 335.3), lead at 8 ppb (EPA method 293.2) and nickel at 70 ppb (EPA method 200.7). No reference or QA/QC samples are known to have been collected [14; 15; 16; 17].

On March 27, 1996, WESTON conducted sediment sampling as part of the SIP. Nine sediment samples, including a duplicate sample and three reference samples, were collected from eight locations at the property. Three sediment samples were collected from the Woonasquatucket River and six sediment samples were collected from wetlands along the drainage channel to evaluate the surface water pathway (Figure 2). In addition, a trip blank sample, prepared with high purity liquid chromatography (HPLC) water and an equipment rinsate sample, prepared with HPLC water and deionized water, were also collected. Sediment samples collected by WESTON were submitted for VOC, SVOC, pesticide/PCB, total metals, and cyanide analyses through the EPA CLP. Sediment sample locations are presented in Table 7 and depicted on Figure 2 [1].

During the WESTON environmental sampling event, a surface water sheen and sediment discoloration were observed along the Woonasquatucket River adjacent to the property. In addition, an area of stressed vegetation measuring approximately 15 feet by 30 feet was observed in the southern portion of the property. The stressed vegetation occurred in a low-lying drainage area along the overland flow route between on-site paved areas and the Woonasquatucket River. A sheen and discolored sediment were also observed along a section of the Woonasquatucket River located south of the property [1].

Table 7

**Sample Summary: Centredale Manor,
Sediment Samples Collected by WESTON on March 27, 1996**

Sample Location No.	Traffic Report No.	Time	Remarks	Sample Depth	Sample Source
MATRIX: Sediment					
SD-01	AHD10 MAFC09	0230	Grab	0 to 6 inches	Sediment sample collected 500 feet south of the Woonasquatucket River PPE near the former drum disposal area and overland flow route.
SD-02	AHD11 MAFC10	0245	Grab	0 to 6 inches	Sediment sample collected 250 feet south of the Woonasquatucket River PPE where the overland flow from the upper parking lot discharges.

Table 7

**Sample Summary: Centredale Manor,
Sediment Samples Collected by WESTON on March 27, 1996
(concluded)**

Sample Location No.	Traffic Report No.	Time	Remarks	Sample Depth	Sample Source
SD-03	AHD12 MAFC11	0215	Grab	0 to 6 inches	Reference sediment sample collected approximately 150 feet north of Woonasquatucket River PPE.
SD-04	AHD13 MAFC12	0300	Grab	0 to 6 inches	Sediment sample collected from wetlands located on the southeast portion of the property along the drainage channel (MS/MSD).
SD-05	AHD14 MAFC13	0330	Grab	0 to 6 inches	Sediment sample collected along the drainage channel.
SD-06	AHD15 MAFC14	0330	Grab	0 to 6 inches	Duplicate of SD-05 for quality control.
SD-07	AHD16 MAFC15	0340	Grab	0 to 6 inches	Reference sediment sample collected approximately 150 feet north of drainage channel PPE.
SD-08	AHD17 MAFC16	0315	Grab	0 to 6 inches	Sediment sample collected east of the Centredale Manor Apartment building along the drainage channel.
SD-09	AHD18 MAFC17	0315	Grab	0 to 6 inches	Reference sediment sample collected approximately 125 feet north of drainage channel PPE.
MATRIX: Aqueous					
TB-01	AHD20	0345	Grab	NA	Trip Blank sample collected for quality control.
RB-01	AHD21 MAFC19	0350	Grab	NA	Rinsate Blank sample collected for quality control.

MS/MSD = Matrix Spike/Matrix Spike Duplicate.

NA = Not Applicable

Table 8 is a summary of organic compounds and inorganic elements detected through EPA CLP analyses of WESTON sediment samples. For each sample location, a compound or element is listed if it was detected at three times or greater than the reference sample's concentration (SD-03 for Woonasquatucket River samples, and SD-07 and SD-09 for drainage channel samples). However, if the compound or element was not detected in the reference sample, the reference sample's SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference sample's SQL or SDL and are designated by their approximate relative concentration above these values [27; 28].

Complete analytical results of WESTON sediment samples, including quantitation and detection limits are presented in Attachment B [27; 28]. Sample results qualified with a "J" on the analytical tables are considered approximate because of limitations identified during the CLP data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate; however WESTON has included the detected concentrations of J'd substances to remain consistent with technical derivatives provided by EPA Region I.

Table 8

**Summary of Analytical Results: Sediment Sample Analyses
for Centredale Manor, Samples Collected by WESTON on March 27, 1996**

Sample Location	Compound/Element	Sample Concentration	Reference Concentration	Comments
SD-02 (AHD11) (MAFC10)	SVOCs			
	Acenaphthene	1,900 J µg/kg	350 J µg/kg	5.42 x REF
	Anthracene	4,300 J µg/kg	990 J µg/kg	4.34 x REF
	Benzo(a)anthracene	14,000 J µg/kg	3,000 J µg/kg	4.66 x REF
	Benzo(a)pyrene	15,000 J µg/kg	3,200 J µg/kg	4.68 x REF
	Benzo(b)fluoranthene	16,000 J µg/kg	3,900 J µg/kg	4.1 x REF
	Benzo(g,h,i)perylene	9,100 J µg/kg	750 J µg/kg	12.1 x REF
	Benzo(k)fluoranthene	14,000 J µg/kg	2,800 J µg/kg	5.0 x REF
	Carbazole	5,200 J µg/kg	1,100 J µg/kg	4.72 x REF
	Chrysene	19,000 J µg/kg	3,800 J µg/kg	5.0 x REF
	Dibenz(a,h)anthracene	5,100 J µg/kg	730 J µg/kg	6.98 x REF
	Fluoranthene	44,000 J µg/kg	8,500 J µg/kg	5.17 x REF
	Indeno(1,2,3-cd)pyrene	9,400 J µg/kg	1,300 J µg/kg	7.23 x REF
	Phenanthrene	30,000 J µg/kg	5,900 J µg/kg	5.08 x REF
SD-04 (AHD13) (MAFC12)	VOCs			
	2-Butanone	21 J µg/kg	10 U µg/kg	2.1 x SQL
	Chlorobenzene	11 J µg/kg	10 U µg/kg	1.1 x SQL
	INORGANICS			
	Arsenic	9.85 J mg/kg	2.1 J mg/kg	4.69 x REF
	Lead	655 J mg/kg	59.6 J mg/kg	10.9 x REF
	Silver	1.7 J mg/kg	0.49 J mg/kg	3.46 x SQL
	Vanadium	93.7 J mg/kg	9.5 J mg/kg	9.86 x REF
Zinc	354 J mg/kg	102 J mg/kg	3.47 x REF	

Table 8

**Summary of Analytical Results: Sediment Sample Analysis
for Centredale Manor, Samples Collected by WESTON on March 27, 1996
(continued)**

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration	Comments
SD-05 (AHD14) (MAFC13)	SVOCs			
	Acenaphthene	2,000 J µg/kg	380 J µg/kg	5.2 x REF
	Anthracene	7,000 J µg/kg	770 J µg/kg	9.09 x REF
	Benzo(a)fluoranthene	24,000 J µg/kg	2,100 J µg/kg	11.4 x REF
	Benzo(a)pyrene	28,000 J µg/kg	2,200 J µg/kg	12.7 x REF
	Benzo(b)fluoranthene	33,000 J µg/kg	3,000 J µg/kg	11.0 x REF
	Benzo(g,h,i)perylene	18,000 J µg/kg	730 J µg/kg	24.6 x REF
	Benzo(k)fluoranthene	23,000 J µg/kg	2,200 J µg/kg	10.4 x REF
	Carbazole	4,400 J µg/kg	680 J µg/kg	6.4 x REF
	Chrysene	34,000 J µg/kg	2,600 J µg/kg	13.0 x REF
	Dibenz(a,h)anthracene	9,900 J µg/kg	620 J µg/kg	15.9 x REF
	Indeno(1,2,3-cd)pyrene	18,000 J µg/kg	1,200 J µg/kg	15.0 x REF
Phenanthrene	39,000 J µg/kg	3,300 J µg/kg	11.8 x REF	
SD-06 (AHD15) (MAFC14)	SVOCs			
	Acenaphthene	2,000 J µg/kg	380 J µg/kg	5.2 x REF
	Anthracene	7,100 J µg/kg	770 J µg/kg	9.2 x REF
	Benzo(a)anthracene	25,000 J µg/kg	2,100 J µg/kg	11.9 x REF
	Benzo(a)pyrene	29,000 J µg/kg	2,200 J µg/kg	13.1 x REF
	Benzo(b)fluoranthene	31,000 J µg/kg	3,000 J µg/kg	10.3 x REF
	Benzo(g,h,i)perylene	17,000 J µg/kg	730 J µg/kg	23.2 x REF
	Benzo(k)fluoranthene	26,000 J µg/kg	2,200 J µg/kg	11.8 x REF
	Carbazole	4,400 J µg/kg	680 J µg/kg	7.2 x REF
	Chrysene	35,000 J µg/kg	2,600 J µg/kg	13.4 x REF
	Dibenz(a,h)anthracene	10,000 J µg/kg	620 J µg/kg	15.8 x REF
	Fluoranthene	70,000 J µg/kg	4,500 J µg/kg	15.5 x REF
	Indeno(1,2,3-cd)pyrene	19,000 J µg/kg	1,200 J µg/kg	15.8 x REF
	Pyrene	51,000 J µg/kg	4,000 J µg/kg	12.7 x REF
INORGANICS				
Chromium	38.8 J mg/kg	12.6 J mg/kg	3.07 x REF	

Table 8

Summary of Analytical Results: Sediment Sample Analysis
for Centredale Manor, Samples Collected by WESTON on March 27, 1996
(concluded)

Sample Location	Compound/Element	Sample Concentration	Reference Concentration	Comments
SD-08 (AHD17) (MAFC16)	INORGANICS			
	Barium	124 J mg/kg	20.8 J mg/kg	5.96 x REF
	Calcium	20,000 J mg/kg	1,680 J mg/kg	11.9 x REF
	Copper	214 J mg/kg	27.0 J mg/kg	7.9 x REF
	Lead	186 J mg/kg	59.6 J mg/kg	3.12 x REF
	Manganese	472 J mg/kg	136 J mg/kg	3.47 x REF
	Zinc	368 J mg/kg	102 J mg/kg	3.6 x REF

U = Indicates the sample was analyzed but not detected and reports the detection value.
 µg/kg = Microgram per kilogram
 mg/kg = Milligram per kilogram.

WESTON relinquished sample coolers to Federal Express on March 28, 1996 for overnight delivery to CLP-designated laboratories. The sample coolers were temporarily misplaced in transit. The organic samples were not received by the designated laboratory until April 1, 1996, and the inorganic samples were not received until April 14, 1996. As a result, the holding times for all SVOC and pesticide/PCB sediment samples were not met and sample concentrations for these results were J'd or estimated. Additional information regarding sample holding times is presented in Attachment B.

As shown on Table 9, several VOCs, SVOCs, and inorganics were detected at concentrations greater than reference sample concentrations. No pesticides or PCBs were detected in sediment samples collected at the Centredale Manor property [27; 28].

VOCs were detected in sample SD-04 collected from wetlands located on the southeast portion of the property along the drainage channel. 2-Butanone was detected at 21 µg/kg or 2.1 times the SQL and chlorobenzene was detected at 11 µg/kg or 1.1 times the SQL. No other VOCs were detected in sediment samples collected [27].

The SVOCs detected in WESTON sediment samples are primarily polyaromatic hydrocarbons (PAHs). Thirteen SVOCs were detected in sediment sample SD-02 ranging from 350 µg/kg to 8,500 µg/kg or 4.1 to 12.1 times reference concentrations. Twelve SVOCs were detected in sediment sample SD-05 ranging from 380 µg/kg to 3,300 µg/kg or 5.2 to 24.6 times reference concentrations. Thirteen SVOCs were detected in sediment sample SD-06 ranging from 380 µg/kg to 4,500 µg/kg or 5.2 to 23.2 times reference concentrations.

Five inorganic elements were detected in sediment sample SD-04 ranging from 0.49 mg/kg to 59.6 mg/kg or 3.46 times the SDL to 10.9 times reference concentrations. One inorganic element, chromium, was detected in sediment sample SD-06 at a concentration of 12.6 mg/kg or 3.07 times the reference concentration. Six inorganic elements were detected in sediment sample SD-08 ranging from 20.8 mg/kg to 1,680 mg/kg or 3.6 times to 11.9 times reference concentrations.

Many of the elements and compounds detected in sediment samples were also previously detected in NUS/FIT soil samples above reference concentrations and in samples collected from drums removed in 1982 from the Centredale Manor property. This indicates that previous on-site disposal practices may be impacting the surface water quality downstream of the Centredale Manor property.

SOIL EXPOSURE PATHWAY

There are currently 135 residents that live at the Centredale Manor Apartments and three full-time workers. An additional 4,146 people live within a one-mile radius of the Centredale Manor property [1; 23]. The Centredale Manor Apartments are located within 200 feet of observed areas of soil contamination. Vehicular and pedestrian access to the property is unrestricted from U.S Route 44 to the north. Vehicular access is restricted by the Woonasquatucket River to the west, woods to the south, and the drainage channel to the east.

On February 2, 1982, Guild Drilling collected two composite soil samples from ten soil borings advanced in the proposed construction area for the apartment building (Figure 2) [49]. The samples were analyzed for VOCs, SVOCs, and eight EP toxicity metals to determine if the fill removed would be considered hazardous waste. Analyses of soil samples indicated the presence of chloroform, toluene, trichloroethylene, bis(2-ethylhexyl)phthalate and barium at concentrations below regulatory levels according to RI DEM. Six thousand cubic yards of fill were eventually removed during the construction of the apartment building and disposed as non-hazardous solid waste.

On March 27, 1990, NUS/FIT collected ten soil samples, including one trip blank, one duplicate/replicate, and one reference sample from the Centredale Manor property (Figure 2). NUS/FIT soil samples were collected from a depth of 6 to 18 inches bgs and were analyzed through the EPA CLP for VOCs, SVOCs, pesticides, PCBs and inorganic elements. The trip blank was analyzed for VOCs only. A total of six VOCs and twenty-nine SVOCs were detected, including the compound 4-chloroaniline at a concentration of 32,000 ppb. 4-Chloroaniline is commonly found in dyes used in textiles mills, similar to the one that occupied the property in the 1930s. Four pesticides, the PCBs Aroclors 1242 and 1254, and six inorganic elements were also detected in the NUS/FIT soil samples. The analytical results of the NUS/FIT soil samples are discussed in detail in the Waste/Source Sampling Section of this report.

During the WESTON on-site reconnaissance, an area of stressed vegetation measuring approximately 15 feet by 30 feet was observed in the southern portion of the property. The stressed vegetation occurred in a low-lying drainage area along the overland flow route between on-site paved areas and the Woonasquatucket River. An area of stressed vegetation, measuring

approximately 450 square feet, was also observed on the northwest side of the property between on-site parking areas and a Brook Village Apartment parking lot (Figure 2).

Approximately ten deteriorated 55-gallon drums were also observed during the WESTON on-site reconnaissance located along the western boundary of the property along the Woonasquatucket River and in the wooded area located along the southern perimeter of the property (Figure 2). The observed drums were heavily rusted and empty [1].

No schools or day-care facilities are located within 200 feet of observed areas of on-site soil contamination. No terrestrial sensitive environments are known to be located on-site.

AIR PATHWAY

An estimated 104,626 people are located within four radial miles of the Centredale Manor property, including on-site residents and workers [23]. The nearest individuals to the Centredale Manor property are the 135 on-site residents and three full-time workers. The nearest school or day-care is the Pied Piper Nursery school located approximately 0.8 miles northwest of the property [1]. Table 9 summarizes the population located within four radial miles of the Centredale Manor property [23].

Table 9

Estimated Population within Four Miles of Centredale Manor

Radial Distance from Centredale Manor (miles)	Estimated Population
On-site	138
0.00 < 0.25	220
0.25 < 0.50	661
0.50 < 1.00	3,265
1.00 < 2.00	17,881
2.00 < 3.00	30,284
3.00 < 4.00	52,177
TOTAL	104,626

Several sensitive environments have been identified within a four-mile radius of the Centredale Manor property which includes an estimated 241 acres of wetlands and several State-listed species. Table 10 summarizes sensitive environments located within four radial miles of the property [4; 5; 6; 7; 33].

Table 10

Sensitive Environments within Four Radial Miles of Centredale Manor

Radial Distance from Centredale Manor (miles)	Sensitive Environment/Species (status)
0.00 < 0.25	Clean Water Act/ Woonasquatucket River
	1 acre of wetlands
0.25 < 0.50	None Identified
0.50 < 1.00	10 acres of wetlands
1.00 < 2.00	75 acres of wetlands
2.00 < 3.00	One State Endangered Species
	One State Threatened Species
	One Species of State Interest
	Two Species of State Concern
	55 acres of wetlands
3.00 < 4.00	100 acres of wetlands

From 1977 to 1981, several complaints of odors and fumes coming from the property were registered with the RI DOH [29; 30; 31; 32]. No odors were noted by WESTON during the on-site reconnaissance [1]. No records of previous on-site air sampling or air sampling conducted in the vicinity were found in available files. During the WESTON on-site reconnaissance, ambient air was monitored for VOCs using an organic vapor analyzer calibrated to benzene equivalent. No readings above background were noted [1].

SUMMARY

The Centredale Manor property is located at 2074 Smith Street in North Providence, Providence County, Rhode Island. According to the Town of North Providence Tax Assessor's Office, the 5.24-acre Centredale Manor property is registered as Plat 14, Lot 250. A residential apartment complex, which was constructed in 1982, currently occupies the property. Since March 1995, the property has been owned and managed by the Cornerstone Corporation. The complex is known as Centredale Manor and consists of a single eight-story apartment building with 122 residential units and an office. No other buildings are located on the property. Paved areas, including two parking lots occupy approximately one-half of the 5.24-acre property. The remaining portions of the property are covered with maintained lawns and trees.

In the 1930s, Centredale Worsted operated a textile mill on the property. No information regarding the exact dates of operation of the Centredale Worsted mill or the types of textile activities conducted at the mill was found in available file information.

From the 1940s to the early 1970s, two chemical companies were located on the property; Crown Chemical Company and Metro-Atlantic Chemical Company. There was no available information in EPA Region I, RI DEM or local agency files concerning operations of the Crown Chemical Company. The Metro-Atlantic Chemical Company operated as a barrel reclamation factory. Additional information regarding operations at the Metro-Atlantic Chemical Company was not found in available file information. Sometime in the mid-1970s, the existing mill building was demolished and the property was razed. No other file information regarding the demolition of the mill building was found.

There are presently four potential source areas at the Centredale Manor property. These include the 500-gallon diesel fuel UST, fill material located two feet below ground surface (bgs), contaminated surface soil, and the abandoned drums located on the property. There are no other known sources of contamination at the Centredale Manor property.

The communities of Smithfield, Lincoln, North Providence, Providence, and Johnston are located partially or wholly within a four-mile radius of the Centredale Manor property.

An estimated 8,130 people are served by private groundwater sources within a four-mile radius of the Centredale Manor property. The nearest private drinking water well is located approximately 0.12 miles northeast of the property at the Yacht Bottling Company which serves an estimated 1,000 customers from a bedrock well. The nearest public water well is located approximately 0.8 miles northwest of the property at the Pied Piper Nursery School which serves an estimated 130 people. Eleven community water supplies are located within four miles of the property and serve an estimated 1,351 people. No known groundwater sampling has been conducted at the Centredale Manor property.

In October and November 1977, the Rhode Island Department of Health (RI DOH) conducted several investigations at the Centredale Manor property in response to complaints of odors and fumes at the property. Approximately 60, 55-gallon drums were found on the property in a swampy area near the Woonasquatucket River. On November 10, 1977, Acme Services removed ten drums from the swampy area which reportedly contained sulfuric acid. No information was available which documented where the drums were transported. The remaining drums were left on the property.

From December 1979 to March 1981, RI DEM periodically inspected the property. During these inspections, RI DEM observed and inventoried approximately 400 drums. The drums were reported to be in various stages of deterioration. An unknown number of drums were found to contain residual solid and liquid material. Legible drum labels and visual inspection of residual materials indicated that caustics, halogenated solvents, polychlorinated biphenyls (PCBs), and ink wastes potentially containing heavy metals may have been contained in the drums. During the inspections, approximately 150 drums were observed scattered along the bank of the Woonasquatucket River.

On February 22, 1982, C. Pezza and Sons, Inc., under contract to Marshall, excavated and staged approximately 400 drums on the property under the supervision of RI DEM. Drums which were verified to be empty were crushed and sent to a solid waste facility for disposal as non-hazardous waste. Approximately 30 drums with residual materials were stockpiled on the property and sampled on February 27, 1982.

In February 1982, Marshall was retained by the property owners to oversee the characterization and removal of wastes at the Centredale Manor property; these activities were supervised by RI DEM. On February 2, 1982, Guild Drilling, under contract to Marshall, collected two composite soil samples from ten soil borings advanced on the property. The samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and eight extraction procedure (EP) toxicity metals to determine if soils in the construction area would be considered hazardous waste. Analyses of soil samples indicated the presence of chloroform, toluene, trichloroethylene, bis(2-ethylhexyl)phthalate and barium at concentrations below RI DEM regulatory levels.

In 1986, RI DEM received information from the Providence Journal which indicated that several 5,000-gallon USTs used to store hazardous waste were buried at the Centredale Manor property. A ground-penetrating radar survey was conducted by Geo-Centers, Inc. on March 24, 1986, to locate the buried USTs reported at the property. The survey concluded there were no buried USTs on-site; however, other metallic debris, possibly buried drums, may be present along the western edge of the property.

A Preliminary Assessment (PA) of the Centredale Manor property was conducted by NUS/FIT on August 21, 1986. Based on the previous history of the property, NUS/FIT concluded that potentially impacted groundwater, surface water, soil and sediment were present at the property. Based on the findings of the PA, a Screening Site Inspection (SSI) was recommended.

An SSI for Centredale Manor was completed by NUS/FIT on October 15, 1990. On March 27, 1990, NUS/FIT collected ten soil samples from the Centredale Manor property. A total of six VOCs and twenty-nine SVOCs were detected, including the compound 4-chloroaniline at a concentration of 32,000 parts per billion (ppb). 4-Chloroaniline is commonly found in dyes used in textile mills similar to the one that occupied the property in the 1930s. Four pesticides, the PCB Aroclors 1242 and 1254, and six inorganic elements were also detected in the NUS/FIT soil samples.

On March 27, 1996, WESTON collected nine sediment samples from eight locations at the property. Three sediment samples were collected from the Woonasquatucket River and six sediment samples were collected from wetlands along the drainage channel.

During the WESTON environmental sampling event, a surface water sheen and sediment discoloration were observed along the Woonasquatucket River adjacent to the property. In addition, an area of stressed vegetation measuring approximately 15 feet by 30 feet was observed in the southern portion of the property. The stressed vegetation occurred in a low-lying drainage area along the overland flow route between on-site paved areas and the Woonasquatucket River. A sheen and discolored sediment were also observed along a section of the Woonasquatucket River located south of the property.

Analytical results of WESTON sediment samples reported several VOCs, SVOCs, and inorganics at concentrations greater than reference sample concentrations. No pesticides or PCBs were detected in sediment samples collected at the Centredale Manor property.

VOCs were detected in samples collected from wetlands located on the southeast portion of the property along the drainage channel. 2-Butanone was detected at 21 µg/kg or 2.1 times the sample quantitation limit (SQL) and chlorobenzene was detected at 11 µg/kg or 1.1 times the SQL. No other VOCs were detected in sediment samples collected. The SVOCs detected in WESTON sediment samples are primarily polyaromatic hydrocarbons (PAHs). Thirteen SVOCs were detected in sediment samples ranging from 350 µg/kg to 8,500 µg/kg or 4.1 to 12.1 times reference concentrations.

Ten inorganic elements were detected in sediment samples ranging from 1.7 mg/kg to 20,000 mg/kg or 3.12 to 11.9 times reference concentrations. Many of the elements and compounds detected in sediment samples were also previously detected in NUS/FIT soil samples above reference concentrations and in samples collected from drums removed in 1982 from the Centredale Manor property. This indicates that previous on-site disposal practices may be impacting the surface water quality downstream of the Centredale Manor property.

There are currently 135 residents that live at the Centredale Manor Apartments and three full-time workers. An additional 4,146 people live within a one-mile radius of the Centredale Manor property. The Centredale Manor Apartments are located within 200 feet of observed areas of soil contamination. Vehicular and pedestrian access to the property is unrestricted from U.S Route 44 to the north. Vehicular access is restricted by the Woonasquatucket River to the west, woods to the south, and the drainage channel to the east.

CENTREDALE MANOR REFERENCES

- [1] Cook, D. (WESTON). 1995. Logbook from on-site reconnaissance of the Centredale Manor property. October 4. TDD No. 9409-57-CWX.
- [2] Cook, D. (WESTON). 1995. Latitude and Longitude Calculations for the Centredale Manor Property. August 17. TDD No. 9409-57-CWX.
- [3] Cook, D. (WESTON). 1995. Telephone conversation with the North Providence Town Clerk, RE: Centredale Manor property registration. October 10. TDD No. 9409-57-CWX.
- [4] USGS (United States Geological Survey). 1975. Topographical map of Providence, Rhode Island Quadrangle. 7.5 Minute Series Topographic.
- [5] USGS (United States Geological Survey). 1975. Topographical map of North Scituate, Rhode Island Quadrangle. 7.5 Minute Series Topographic.
- [6] USGS (United States Geological Survey). 1975. Topographical map of Georgiaville, Rhode Island Quadrangle. 7.5 Minute Series Topographic.
- [7] Cook, D. (WESTON). 1995. Telephone conversation with North Providence Town Clerk, RE: Current owner of Centredale Manor property. August 18. TDD No. 9409-57-CWX.
- [8] Cook, D. (WESTON). 1995. Telephone conversation with Robert Haviland, (RI DOH), RE: Private water supplies within four radial miles of Centredale Manor. October 31. TDD No. 9409-57-CWX.
- [9] Haviland, R. (RI DOH). 1995. Information addressed to D. Cook, RE: Public and private water supplies within a four mile radius of Centredale Manor. TDD No. 9409-57-CWX.
- [10] RI DOH (Rhode Island Department of Health). 1977. Inspection Report regarding removal of drums form Centredale Manor property by ACME Services. November 10.
- [11] RI DEM (Rhode Island Department of Environmental Management). 1980. Inspection of barrels located on the old Metro-Atlantic Chemical Property. December 10.
- [12] State of Rhode Island and Providence Plantations Division. 1986. Investigation of buried barrel complaint at Centredale Manor property. April 2.
- [13] Geo-Centers, Inc. 1986. Ground penetrating radar report results. March 27.
- [14] RI DEM (Rhode Island Department of Environmental Management). 1994. Analytical results of surface water sampling conducted in the Woonasquatucket River. September 10.

**CENTREDALE MANOR
REFERENCES
(Continued) -**

[15] Cook D. (WESTON). 1995. Telephone conversation with Tim O'Connor (RI DEM), RE: Surface water sampling conducted in the Woonasquatucket River. October 10. TDD No. 9409-57-CWX.

[16] Cook D. (WESTON). 1995. Telephone conversation with David Chohey (RI DEM), RE: Surface water sampling conducted in the Woonasquatucket River. October 17. TDD No. 9409-57-CWX.

[17] Cook D. (WESTON). 1995. Telephone conversation with David Chohey (RI DEM), RE: Surface water sampling conducted in the Woonasquatucket River. October 13. TDD No. 9409-57-CWX.

[18] NUS/FIT (NUS Corporation Field Investigation Team). 1990. Final Screening Site Inspection Report. October 15. TDD No. F1-8909-33.

[19] U.S. EPA (U.S. Environmental Protection Agency). 1995. Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) Superfund Program Region I. U.S. Environmental Protection Agency Print out date April 11.

[20] U.S. EPA (U.S. Environmental Protection Agency). 1995. Resource Conservation and Recovery Act Treatment, Storage, and Disposal Facility and Large Quantity Generators Region I Print out date August 28.

[21] NUS/FIT (NUS Corporation Field Investigation Team). 1986. Preliminary Assessment of the Centredale Manor property. August 21. TDD No. F1-8605-03.

[22] Cook D. (WESTON). 1996. Telephone conversation with Lenny Gidonon (RI DEM Water Resources), RE: Mean annual precipitation in the vicinity of the Centredale Manor property. June 3. TDD No. 9409-57-CWX.

[23] Frost (Frost Associates). 1995. Population census data. October 2.

[24] Cook D. (WESTON). 1995. Telephone conversation with Ms. Elisa Richardson (RI DEM Water Resources), RE: Flow rates of water bodies along the Centredale Manor 15-mile downstream pathway. September 25. TDD No. 9409-57-CWX.

[25] Cook D. (WESTON). 1995. Mr. Chris Powell (RI DEM Fish and Wildlife), RE: Fisheries along the Centredale 15-mile downstream pathway. September 26. TDD No. 9409-57-CWX.

[26] Cook D. (WESTON). 1996. Telephone conversation with Ms. Jean Lambert (RI DEM Water Resources), RE: Surface water classification. June 3. TDD No. 9409-57-CWX.

**CENTREDALE MANOR
REFERENCES
(Continued)**

[27] WESTON (Roy F. Weston, Inc.). 1996. Organic Data Validation Package. Centredale Manor. Case No. 24533; SDG AHD10; TDD No. 9409-57-CWX.

[28] WESTON (Roy F. Weston, Inc.). 1996. Inorganic Data Validation Package. Centredale Manor. Case No. 24533; SDG No. MAFC09; TDD No. 9409-57-CWX.

[29] RI DEM (Rhode Island Department of Environmental Management). 1979. Field Inspection Report, Brook Village, Smith Street, Centredale, Rhode Island. December 12.

[30] RI DOH (Rhode Island Department of Health). 1977. Complaint Report: Fumes form chemicals buried at Old Crown Chemical Site. October 26.

[31] RI DOH (Rhode Island Department of Health). 1977. Complaint Report: Fumes form chemicals buried at Old Crown Chemical Site. October 27.

[32] RI DOH (Rhode Island Department of Health). 1977. Inspection report suspected violation. November 1.

[33] Michaud, Joanne (RI Natural Heritage Program). 1995. Letter addressed to D. Cook (WESTON), RE: Sensitive environments located within a four-mile radius of Centredale Manor. August 28. TDD No. 9409-57-CWX.

[34] Rhode Island Analytical Laboratories, Inc. 1982. Certificate of analyses for soil samples of fill material collected from proposed Centredale Manor property. February 10.

[35] U.S. EPA (U.S. Environmental Protection Agency). 1995. Superfund Chemical Data Matrix. September 25.

[36] U.S. EPA (U.S. Environmental Protection Agency). 1992. Interim Final Hazard Ranking System Guidance Manual. November.

[37] Cerroni, E. (Town of North Providence, Building Inspector). 1978. Letter to Centredale Properties Corp., RE: Inspection of Centredale Manor property. April 7.

[38] NUS/FIT (NUS Corporation/Field Investigation Team). 1986. Logbook from Preliminary Assessment of the Centredale Manor property. May 20. TDD No. F1-8605-03.

[39] McVay, D. (RI DEM). 1980. Telecon with Rhode Island Attorney General's Office, RE: Centredale Manor property. May 16.

[40] Cullinane, J. (RI DEM). 1980. Complaint Investigation Report, RE: Centredale Manor property. November 24.

**CENTREDALE MANOR
REFERENCES
(Concluded)**

[41] Leo, J. (RI DEM). 1981. Inter-office memorandum to Wright, T. (RI DEM), RE: Inspection of Metro-Chemical Disposal Site. January 26.

[42] Wright, T. (RI DEM). 1981. Inter-off memorandum to Quinn, J. (RI DEM), RE: Metro-chemical Disposal Site. January 26.

[43] Leo, J. (RI DEM). 1981. Field Investigation Report for Metro-Chemical Site. March 17.

[44] RI DEM (Rhode Island Department of Environmental Management). 1981. Notice of Violation and Order, issued to Buonanno, J. and Ricci, E. owners of Centredale Manor property. November 23.

[45] Marshall Contractors, Inc. 1982. Job Meeting Minutes - Centredale Manor. February 1.

[46] Leo, J. (RI DEM). 1981. Field Investigation Report for Centredale Manor property. October 16.

[47] Leo, J. (RI DEM). 1982. Inter-office memorandum to project file, RE: Removal of drums from Old Metro-Chemical Site, Centredale, North Providence. March 2.

[48] Powers, M. (RI DEM). Memorandum to Lund, W. (Marshall Contractors, Inc.), RE: Centredale Manor - Drum Removal. April 1.

[49] GZA (Goldberg, Zoino & Associates, Inc.). 1982. Centredale Manor Soil Quality Testing Report. February 11.

[50] Easterday, A. (WESTON). 1997. Telecon with Duhmel, P. (RI DEM), RE: Groundwater classifications for SIP sites. January 14.

[51] Cook, D. (WESTON). 1996. Telecon with Sgambato, M. (Yacht Bottling Co.), RE: Number of customers served. April 26. TDD No. 9409-57-CWX.

ATTACHMENT A
CENTREDALE MANOR
SOIL SAMPLE ANALYTICAL RESULTS
NUS CORPORATION FIELD INVESTIGATION TEAM

Samples collected March 27, 1990

CENT. LE M...
MAR. 28, 1990
CLP VOLATILE ORGANIC ANALYSIS
SOIL SAMPLE QUANTITATION LIMITS (ug/Kg)

Sample Location	SS-01	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-08D	SS-09
Sample Number	23741	23742	23743	23744	23745	23746	23747	23748	23749	23750
Traffic Report Number	AR420	AR421	AR422	AR423	AR424	AR425	AR426	AR427	AR428	AR429
Remarks	BLANK								DUPLICATE	BACKGROUND
VOLATILE ORGANIC COMPOUND										
Chloromethane	10	11	12	69	14	12	13	14	14	12
Bromomethane	10	11	12	69	14	12	13	14	14	12
Vinyl Chloride	10	11	12	69	14	12	13	14	14	12
Chloroethane	10	11	12	69	14	12	13	14	14	12
Methylene Chloride	5	6	6	35	7	6	7	7	7	6
Acetone	10	11	21	69	110	13	32	29	29	12
Carbon Disulfide	5	6	6	35	7	6	7	7	7	6
1,1-Dichloroethene	5	6	6	35	7	6	7	7	7	6
1,1-Dichloroethane	5	6	6	35	7	6	7	7	7	6
1,2-Dichloroethene (Total)	5	6	6	35	7	6	7	7	7	6
Chloroform	5	6	6	35	7	6	7	7	7	6
1,2-Dichloroethane	5	6	6	35	7	6	7	7	7	6
2-Butanone	10	11	12	69	14	12	13	14	14	12
1,1,1-Trichloroethane	5	6	6	35	7	6	7	7	7	6
Carbon Tetrachloride	5	6	6	35	7	6	7	7	7	6
Vinyl Acetate	10	11	12	69	14	12	13	14	14	12
Bromodichloromethane	5	6	6	35	7	6	7	7	7	6
1,2-Dichloropropane	5	6	6	35	7	6	7	7	7	6
cis-1,3-Dichloropropene	5	6	6	35	7	6	7	7	7	6
Trichloroethene	5	6	6	35	7	6	7	7	7	6
Dibromochloromethane	5	6	6	35	7	6	7	7	7	6
1,1,2-Trichloroethane	5	6	6	35	7	6	7	7	7	6
Benzene	5	6	6	35	7	6	7	7	7	6
trans-1,3-Dichloropropene	5	6	6	35	7	6	7	7	7	6
Bromoform	5	6	6	35	7	6	7	7	7	6
4-Methyl-2-pentanone	10	11	12	69	14	12	13	14	14	12 U
2-Hexanone	10	11	12	69	14	12	13	14	14	12 U
Tetrachloroethene	5	6	6	35	7	6	7	7	7	6 U
1,1,2,2-Tetrachloroethane	5	6	6	35	7	6	7	7	7	6 U
Toluene	5	6	6	35	7	6	7	7	7	6 U
Chlorobenzene	5	6	6	35	7	6	7	7	7	6 U
Ethylbenzene	5	6	6	35	7	6	7	7	7	6 U
Styrene	5	6	6	35	7	6	7	7	7	6 U
Xylene (Total)	5	6	6	35	7	6	7	7	7	6 U

Sample Quantitation Limits are reported on a dry weight basis.

U) Quantitation Limit is approximate due to limitations identified during the quality control review.

PAGE 3
CENTRAL LE MANOR
MARCH 28, 1990
CLP EXTRACTABLE ORGANIC ANALYSIS
SOIL SAMPLE QUANTITATION LIMITS (ug/Kg)

Sample Location	SS-01	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-08D	SS-09
Sample Number	23741	23742	23743	23744	23745	23746	23747	23748	23749	23750
Traffic Report Number	AR420	AR421	AR422	AR423	AR424	AR425	AR426	AR427	AR428	AR429
Remarks	BLANK								DUPLICATE	BACKGROUND
Sampling Date	28-MARCH-90									
Extraction Date	04-APRIL-90									
Analysis Date	10-APRIL-90	11-APRIL-90	11-APRIL-90	11-APRIL-90	11-APRIL-90	10-APRIL-90	11-APRIL-90	10-APRIL-90	10-APRIL-90	10-APRIL-90
SEMI-VOLATILE COMPOUND										
Phenol	670	740	800	920	900	770	870	890	940	810
bis (2-Chloroethyl) ether	670	740	800	920	900	770	870	890	940	810
2-Chlorophenol	670	740	800	920	900	770	870	890	940	810
1,3-Dichlorobenzene	670	740	800	920	900	770	870	890	940	810
1,4-Dichlorobenzene	670	740	800	920	900	770	870	890	940	810
Benzyl Alcohol	670	740	800	920	900	770	870	890	940	810
1,2-Dichlorobenzene	670	740	800	920	900	770	870	890	940	810
2-Methylphenol	670	740	800	920	900	770	870	890	940	810
bis (2-Chloroisopropyl) ether	670	740	800	920	900	770	870	890	940	810
4-Methylphenol	670	740	800	920	900	770	870	890	940	810
N-Nitroso-di-n-propylamine	670	740	800	920	900	770	870	890	940	810
Hexachloroethane	670	740	800	920	900	770	870	890	940	810
Nitrobenzene	670	740	800	920	900	770	870	890	940	810
Isophorone	670	740	800	920	900	770	870	890	940	810
2-Nitrophenol	670	740	800	920	900	770	870	890	940	810
2,4-Dimethylphenol	670	740	800	920	900	770	870	890	940	810
Benzoic acid	3200	3600	3900	4400	4400	3700	4200	4300	4600	4000
bis (2-Chloroethoxy) methane	670	740	800	920	900	770	870	890	940	810
2,4-Dichlorophenol	670	740	800	920	900	770	870	890	940	810
1,2,4-Trichlorobenzene	670	740	800	920	900	770	870	890	940	810
Naphthalene	670	740	800	920	900	770	870	890	940	810
4-Chloroaniline	670 UJ	7400	800	920	900	770 UJ	870	890 UJ	940 UJ	810 UJ
Hexachlorobutadiene	670	740	800	920	900	770	870	890	940	810
4-Chloro-3-methylphenol	670	740	800	920	900	770	870	890	940	810
2-Methylnaphthalene	670	740	800	920	900	770	870	890	940	810
Hexachlorocyclopentadiene	670	740	800	920	900	770	870	890	940	810
2,4,6-Trichlorophenol	670	740	800	920	900	770	870	890	940	810
2,4,5-Trichlorophenol	3200	3600	3900	4400	4400	3700	4200	4300	4600	4000
2-Chloronaphthalene	670	740	800	920	900	770	870	890	940	810
2-Nitroaniline	3200	3600	3900	4400	4400	3700	4200	4300	4600	4000
Dimethylphthalate	670	740	800	920	900	770	870	890	940	810
Acenaphthylene	670	740	800	920	900	770	870	890	940	810
2,6-Dinitrotoluene	670	740	800	920	900	770	870	890	940	810

CEN ALE MANOR
 MARCH 28, 1990
 CLP EXTRACTABLE ORGANIC ANALYSIS
 SOIL SAMPLE QUANTITATION LIMITS (ug/Kg)

Sample Location	SS-01	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-08D	SS-09
Sample Number	23741	23742	23743	23744	23745	23746	23747	23748	23649	23750
Traffic Report Number	AR420	AR421	AR422	AR423	AR424	AR425	AR426	AR427	AR428	AR429
Remarks	BLANK								DUPLICATE	BACKGROUND
SEMI-VOLATILE COMPOUND										
3 Nitroaniline	3200	3600	3900	4400	4400	3700	4200	4300	4600	4000
Acenaphthene	670	740	800	920	900	770	870	890	940	810
2,4-Dinitrophenol	3200	3600	3900	4400	4400	3700	4200	4300	4600	4000
4-Nitrophenol	3200	3600	3900	4400	4400	3700	4200	4300	4600	4000
Dibenzofuran	670	740	800	920	1500	770	870	890	940	810
2,4-Dinitrotoluene	670	740	800	920	900	770	870	890	940	810
Diethylphthalate	670	740	800	920	900	770	870	890	940	810
4-Chlorophenyl-phenylether	670	740	800	920	900	770	870	890	940	810
Fluorene	670	740	800	920	3100	770	870	890	940	810
4 Nitroaniline	3200	3600	3900	4400	4400	3700	4200	4300	4600	4000
4,6-Dinitro-2-methylphenol	3200	3600	3900	4400	4400	3700	4200	4300	4600	4000
N Nitrosodiphenylamine	670	740	800	920	900	770	870	890	940	810
4-Bromophenyl-phenylether	670	740	800	920	900	770	870	890	940	810
Hexachlorobenzene	670	740	800	920	900	770	870	890	940	810
Pentachlorophenol	3200	3600	3900	4400	4400	3700	4200	4300	4600	4000
Phenanthrene	670	740	800	920	1800	770	870	890	940	810
Anthracene	670	740	800	920	900	770	870	890	940	810
Di-n-butylphthalate	670	740	800	920	900	770	870	890	940	810
Fluoranthene	670	740	800	920	900	770	870	890	940	810
Pyrene	670	740	800	920	900	770	870	890	940	810
Butylbenzylphthalate	670	740	800	920	900	770	870	890	940	810
1,3'-Dichlorobenzidine	1300 UJ	740 UJ	1600	1800 UJ	1800 UJ	1500 UJ	1700	1800 UJ	1900 UJ	1600 UJ
Benzo(a)anthracene	670	740	800	920	900	770	870	890	940	810
Chrysene	670	740	800	920	900	770	870	890	940	810
bis(2-Ethylhexyl)phthalate	670	740	800	920	900	770	870	890	940	810
Di-n-octyl phthalate	670	740	800	920	900	770	870	890	940	810
Benzo(b)fluoranthene	670	740	800	920	900	770	870	890	940	810
Benzo(k)fluoranthene	670	740	800	920	900	770	870	890	940	810
Benzo(a)pyrene	670	740	800	920	900	770	870	890	940	810
Indeno (1,2,3-cd)pyrene	670	740	800	920	900	770	870	890	940	810
Dibenz(a,h)anthracene	670	740	800	920	900	770	870	890	940	810
Benzo(g,h,i)perylene	670	740	800	920	900	770	870	890	940	810

TABLE 2 PAGE 3 OF 3
CENTREDALE MANOR
MARCH 28, 1990
CLP EXTRACTABLE ORGANIC ANALYSIS
SOIL SAMPLE QUANTITATION LIMITS (ug/Kg)

Sample Location	SS-01	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-08D	SS-09
Sample Number	23741	23742	23743	23744	23745	23746	23747	23748	23749	23750
Traffic Report Number	AR420	AR421	AR422	AR423	AR424	AR425	AR426	AR427	AR428	AR429
Remarks	BLANK								DUPLICATE	BACKGROUND
PESTICIDE/PCB COMPOUND										
alpha-BHC	16	18	20	22	22	19	21	22	23	20
beta-BHC	16	18	20	22	22	19	21	22	23	20
delta-BHC	16	18	20	22	22	19	21	22	23	20
gamma-BHC (Lindane)	16	18	20	22	22	19	21	22	23	20
eptachlor	16	18	20	22	22	19	21	22	23	20
Aldrin	16	18	20	22	22	19	21	22	23	20
Heptachlor epoxide	16	18	20	22	22	19	21	22	23	20
Endosulfan I	16	18	20	22	22	19	21	22	23	20
Dieldrin	32	36	39	44	44	37	42	43	46	40
4,4' DDE	32	36	39	44	44	37	42	43	46	40
Endrin	32	36	39	44	44	37	42	43	46	40
Endosulfan II	32	36	39	44	44	37	42	43	46	40
4,4' DDD	32	36	39	44	44	37	42	43	46	40
Endosulfan sulfate	32	36	39	44	44	37	42	43	46	40
4,4' DDT	32	36	39	44	44	37	42	43	46	40
Methoxychlor	160	180	200	220	220	190	210	220	230	200
Endrin ketone	32	36	39	44	44	37	42	43	46	40
alpha-Chlordane	160	180	200	220	220	190	210	220	230	200
gamma-Chlordane	160	180	200	220	220	190	210	220	230	200
Toxaphene	320	360	390	440	440	370	420	430	460	400
Aroclor-1016	160	180	200	220	220	190	210	220	230	200
Aroclor-1221	160	180	200	220	220	190	210	220	230	200
Aroclor-1232	160	180	200	220	220	190	210	220	230	200
Aroclor-1242	160	180	200	220	220	190	210	220	230	200
Aroclor-1248	160	180	200	220	220	190	210	220	230	200
Aroclor-1254	320	360	390	440	460	370	420	430	460	400
Aroclor-1260	320	360	390	440	460	370	420	430	460	400

Sample Quantitation Limits are reported on a dry weight basis.

UJ Quantitation limit is approximate due to limitations identified during the quality control review.

TABLE PAGE 2 OF 3
CENTREDALE MANOR
MARCH 28, 1990
CLP EXTRACTABLE ORGANIC ANALYSIS
SOIL ANALYTICAL RESULTS (ug/Kg)

Sample Location	SS-01	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-08D	SS-09
Sample Number	23741	23742	23743	23744	23745	23746	23747	23748	23649	23750
Traffic Report Number	AR420	AR421	AR422	AR423	AR424	AR425	AR426	AR427	AR428	AR429
Remarks	BLANK								DUPLICATE	BACKGROUND
SEMI-VOLATILE COMPOUND										
3-Nitroaniline										
Acenaphthene					1900					
2,4 Dinitrophenol										
4-Nitrophenol										
Dibenzofuran					1500					
2,4-Dinitrotoluene										
Diethylphthalate										
4 Chlorophenyl-phenylether										
Fluorene					3100					
4 Nitroaniline										
4,6-Dinitro-2-methylphenol										
N Nitrosodiphenylamine										
4 Bromophenyl-phenylether										
Hexachlorobenzene										
Pentachlorophenol									430 J	
Phenanthrene			290 J	160 J	16000		300 J			120 J
Anthracene			56 J		3300					
Di-n-butylphthalate		630 J	120 J	340 J		61				48 J
Fluoranthene		210 J	500 J	230 J	11000	190 J	410 J			150 J
Pyrene		1700 J	560 J	240 J	8900 J	180 J	380 J		110 J	180 J
Butylbenzylphthalate		1100 J		190 J						
3,3'-Dichlorobenzidine										
Benzo(a)anthracene			300 J	120 J	8900		250 J			100 J
Chrysene			370 J	160 J	7500		290 J			120 J
bis(2-Ethylhexyl)phthalate		15000 J		2300 J						
Di-n-octyl phthalate										
Benzo(b)fluoranthene			350 J	150 J	5400		270 J			
Benzo(k)fluoranthene			260 J	110 J	11000		280 J			
Benzo(a)pyrene			320 J	130 J	6100		270 J			
Indeno (1,2,3-cd)pyrene			180 J		3500					
Dibenz(a,h)anthracene					1300					
Benzo(g,h,i)perylene			220 J		3900					

TABL PAGE 3 OF 3
CENTRALE MANOR
MARCH 28, 1990
CLP EXTRACTABLE ORGANIC ANALYSIS
SOIL ANALYTICAL RESULTS (ug/Kg)

Sample Location	SS-01	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-08D	SS-09
Sample Number	23741	23742	23743	23744	23745	23746	23747	23748	23749	23750
Traffic Report Number	AR420	AR421	AR422	AR423	AR424	AR425	AR426	AR427	AR428	AR429
Remarks	BLANK								DUPLICATE	BACKGROUND
Sampling Date	28-MARCH-90									
Extraction Date	03-APRIL-90									
Analysis Date	26-APRIL-90									
PESTICIDE/PCB COMPOUND										
alpha-BHC										
beta-BHC										
delta-BHC										
gamma-BHC (Lindane)										
Heptachlor										
Aldrin										
Heptachlor epoxide		370 J	130 J							
Endosulfan I										
Dieldrin		640 J	140	2800 J		94				
4,4' DDE										
Lndrin										
Endosulfan II					24 J					
4,4'-DDD		1000 J								
Endosulfan sulfate										
4,4'-DDT										
Methoxychlor										
Endrin ketone										
alpha-Chlordane										
gamma-Chlordane										65 J
Toxaphene										
Aroclor-1016										
Aroclor-1221										
Aroclor-1232										
Aroclor-1242		1200 J	2200	7500 J		560	370			890
Aroclor-1248										
Aroclor-1254			2100	25000 J	460	1000	780	240 J	250 J	480
Aroclor-1260										

A blank space indicates the compound was not detected.

Sample results are reported on a dry weight basis.

J Quantitation is approximate due to limitations identified during the quality control review.

Sample Quantitation Limits for the compounds listed above are reported in Attachment C Table 2

TABLE PAGE 1 OF 1
CENTREDALE MANOR
MARCH 28, 1989
CLP INORGANIC ANALYSIS
SOIL ANALYTICAL RESULTS (mg/Kg)

Sample Location		SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-08D	SS-09
Sample Number		23742	23743	23744	23745	23746	23747	23748	23749	23750
Traffic Report Number		MAM970	MAM969	MAM968	MAM967	MAM966	MAM965	MAM964	MAM963	MAM962
Remarks									DUPLICATE	BACKGROUND
INORGANIC ELEMENTS										
Aluminum	P	5790 00	7640 00	4350 00	4490 00	6920 00	4500 00	6180 00	6930 00	5770 00
Antimony	P		R	R	R	R	R	R	R	R
Arsenic	F	5 00	6 40	11 30	6 00	4 80	8 80	1 20	1 60 J	3 30
Barium	P	85 50	96 50	91 90	63 60	33 10	182 00	19 50	21 70	99 50
Beryllium	P		0 20 J		0 46 J	0 43 J	0 67 J	0 64 J	1 10	0 93
Cadmium	P	4 80		19 30						
Calcium	P	4300 00	2560 00	1620 00	1990 00	1380 00	2770 00	827 00	715 00	2240 00
Chromium	P	60 90 J	24 30 J	192 00 J	107 00 J	10 90 J	16 00 J	8 10 J	8 00 J	21 30 J
Cobalt	P									
Copper	P	54 90 J	49 30 J	213 00 J	29 90 J	20 70 J	43 70 J			21 50 J
Iron	P	14100 00	15800 00	17400 00	9300 00	9800 00	10200 00	8630 00	10100 00	14600 00
Lead	P	209 00	133 00	151 00	177 00	90 30	92 10	15 20	18 60	92 70
Magnesium	P	1190 00	1710 00	923 00	950 00	1010 00	661 00	768 00	817 00	653 00
Manganese	P	111 00 J	123 00 J	255 00 J	101 00 J	182 00 J	683 00 J	102 00 J	105 00 J	294 00 J
Mercury	CV	2 00 J	0 15 J	1 60 J	0 16 J	0 23 J	0 12 J			0 14 J
Nickel	P									
Potassium	P	681 00 J	764 00 J	791 00 J	343 00 J	694 00 J	515 00 J	362 00 J	420 00 J	490 00 J
Selenium	F									
Silver	P									
Sodium	P	507 00	545 00	2600 00	380 00	372 00	468 00	340 00	428 00	562 00
Thallium	F									
Vanadium	P	15 60	18 70	10 50	13 00	11 10	14 70	10 90	11 80	14 30
Zinc	P	194 00 J	222 00 J	197 00 J	213 00 J	73 10 J	121 00 J	38 60 J	44 40 J	505 00 J
Cyanide	C	NA	NA							

Analytical Method
F Furnace
P ICP/Flame AA
CV Cold Vapor
C Colorimetric

NOTE:

A blank space indicates the element was not detected.
Sample results are reported on a dry weight basis.
J Quantitation is approximate due to limitations identified in the quality control review
R Value is rejected.
NA Not Analyzed

Sample Detection Limits for the elements listed above are reported in Attachment C Table 3

FINAL SUMMARY REPORT
FOR
EXPANDED SITE INSPECTION
CENTREDALE MANOR SITE
NORTH PROVIDENCE, RHODE ISLAND

Prepared For:
U.S. Environmental Protection Agency
Region I
Office of Site Remediation and Restoration
1 Congress Street, Suite 1100
Boston, MA 02114-2023

CONTRACT NO. 68-W5-0009

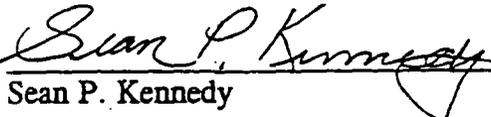
CERCLIS NO. RID981203755
TDD NO. 98-06-0017
PCS NO. 5366
DC NO. A-3698

Submitted By:
Roy F. Weston, Inc. (WESTON®)
Superfund Technical Assessment and Response Team (START)
217 Middlesex Turnpike
Burlington, MA 01803

9 March 1999

Region I START

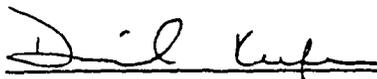
Reviewed and Approved:



Sean P. Kennedy
Site Leader

3/9/99

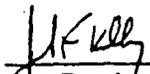
Date



Daniel Keefe
Project Leader

3/9/99

Date



QA Review

3/9/99

Date

Work Order No. 11098-031-001-5366-70

DISCLAIMER

This report was prepared solely for the use and benefit of the U.S. Environmental Protection Agency Region I (EPA Region I), Office of Site Remediation and Restoration for the specific purposes set forth in the contract between the EPA Region I and the Roy F. Weston, Inc. (WESTON®), Superfund Technical Assessment and Response Team (START). Professional services performed and reports generated by START have been prepared for EPA Region I purposes as described in the START contract. The information, statements, and conclusions contained in the report were prepared in accordance with the statement of work, and contract terms and conditions. The report may be subject to differing interpretations or misinterpretation by third parties who did not participate in the planning, research or consultation processes. Any use of this document or the information contained herein by persons or entities other than the EPA Region I shall be at the sole risk and liability of said person or entity. START, therefore, expressly disclaims any liability to persons other than the EPA Region I who may use or rely upon this report in any way or for any purpose.

TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>	
INTRODUCTION	1	
SITE DESCRIPTION	1	
OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS	7	
SUMMARY	35	
REFERENCES		
ATTACHMENT A - CENTREDALE MANOR SITE SOIL AND SEDIMENT SAMPLE RESULTS SEMIVOLATILE ORGANIC COMPOUNDS AND PESTICIDES/POLYCHLORINATED BIPHENYLS Samples collected by START on 9 September 1998		A-1
ATTACHMENT B - CENTREDALE MANOR SITE SOIL AND SEDIMENT SAMPLE RESULTS DIOXINS/HEXACHLOROANTHRENE Samples collected by START on 9 September 1998		B-1
ATTACHMENT C - CENTREDALE MANOR SITE SOIL AND SEDIMENT SAMPLE RESULTS TOTAL ORGANIC CARBON Samples collected by START on 9 September 1998		C-1

LIST OF FIGURES

<u>Figure No.</u>	<u>Title</u>	<u>Page</u>
1A	Location Map - Woonasquatucket River (North)	2
1B	Location Map - Woonasquatucket River (Central)	3
1C	Location Map - Woonasquatucket River (South)	4
2	Site Sketch - Centredale Manor Property	5
3A	Sample Location Map (North)	12
3B	Sample Location Map (Central)	13
3C	Sample Location Map (South)	14

LIST OF TABLES

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
1	Sample Summary: Centredale Manor Site Samples Collected by START on 9 September 1998	15
2	Soil Sample Results for Centredale Manor Site Above Residential Direct Exposure Criteria	20
3	Summary of Analytical Results Sediment Sample Analysis for Woonasquatucket River Samples SD-01 through SD-32	23
4	Summary of Analytical Results Sediment Sample Analysis for Woonasquatucket River Samples SD-33 through SD-39	32
5	Soil Sample Results for 15 January 1999 Above Residential Direct Exposure Criteria	34

INTRODUCTION

The Roy F. Weston, Inc. (WESTON®), Superfund Technical Assessment and Response Team (START) was requested by the U.S. Environmental Protection Agency Region I (EPA Region I), Office of Site Remediation and Restoration to perform an Expanded Site Inspection (ESI) of the Centredale Manor Site consisting of the Centredale Manor property, located at 2074 Smith Street in North Providence, Providence County, Rhode Island, portions of the Brook Village property, and sections of the Woonasquatucket River. Tasks were conducted in accordance with technical specifications provided by EPA Region I. A Preliminary Assessment (PA) of the Centredale Manor property was conducted by the NUS Corporation, Inc. Field Investigation Team (NUS/FIT) in August 1986. NUS/FIT conducted a Screening Site Inspection (SSI) of the Centredale Manor property in October 1990, and WESTON completed a Site Inspection Prioritization (SIP) of the Centredale Manor property in May 1997. These previous investigations indicated the presence of organic and inorganic substances in soil, sediment, and surface water on and in the vicinity of the property. On the basis of the information provided in these reports, the Centredale Manor Site ESI was initiated.

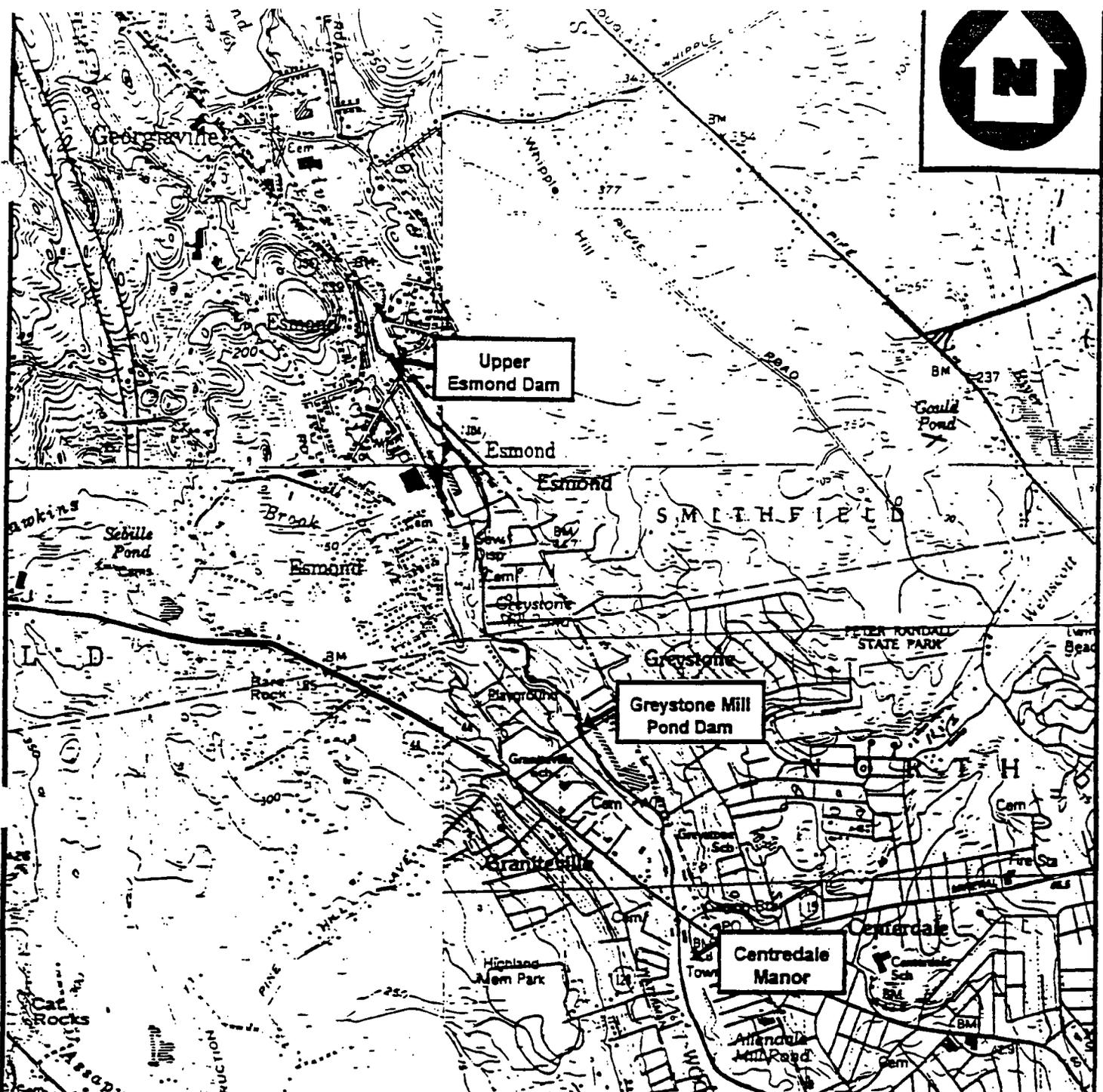
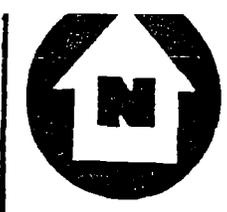
Background information used in the generation of this report was obtained through file searches conducted at the EPA Region I and Rhode Island Department of Environmental Management (RIDEM), telephone interviews with town officials, conversations with persons knowledgeable of the Centredale Manor Site, and conversations with other Federal, State, and local agencies.

This package follows the guidelines developed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, commonly referred to as Superfund. However, these documents do not necessarily fulfill the requirements of other EPA Region I regulations such as those under the Resource Conservation and Recovery Act (RCRA) or other Federal, State, or local regulations. ESIs are intended to provide a preliminary screening of sites to facilitate EPA Region I's assignment of site priorities. They are limited efforts and are not intended to supersede more detailed investigations.

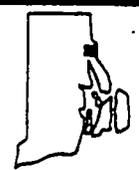
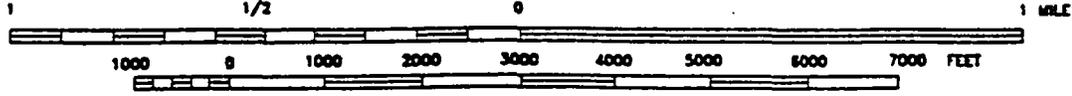
SITE DESCRIPTION

The Centredale Manor property, portions of the Brook Village property, and sections of the Woonasquatucket River (upstream of, adjacent to, and downstream of the Centredale Manor property) were investigated as part of the Centredale Manor Site ESI investigation (Figures 1A, 1B, and 1C). The Centredale Manor property is located at 2074 Smith Street (also referred to as Route 44 in the CERCLIS database) in North Providence, Providence County, Rhode Island at geographic coordinates 41° 51' 29.5" north latitude and 71° 30' 28.5" west longitude [13].

According to the Town of North Providence Tax Assessor's Office, the 4.74-acre Centredale Manor property is registered as Plat 14, Lot 250. The property is bordered by Brook Village Apartments to the north, a small wooded area and an unpaved perennial drainage channel (drainage channel) to the east, a wooded area to the south, and the Woonasquatucket River to the west (Figure 2). George Waterman Road and a residential area are located approximately 100 feet west of the river, up a steep embankment [1, pp. 1, 3].



BASE MAP IS A PORTION OF THE FOLLOWING 7.5 X 15' MINUTE U.S.G.S. QUADRANGLE(S):
 PROVIDENCE, RI 1987; PAWTUCKET, RI-MA 1949 (PHOTOREVISED 1970 AND 1975);
 GEORGIAVILLE, RI 1954 (PHOTOREVISED 1970 AND 1975); NORTH SCITUATE, RI 1955 (PHOTOREVISED 1970 AND 1975)



QUADRANGLE LOCATION

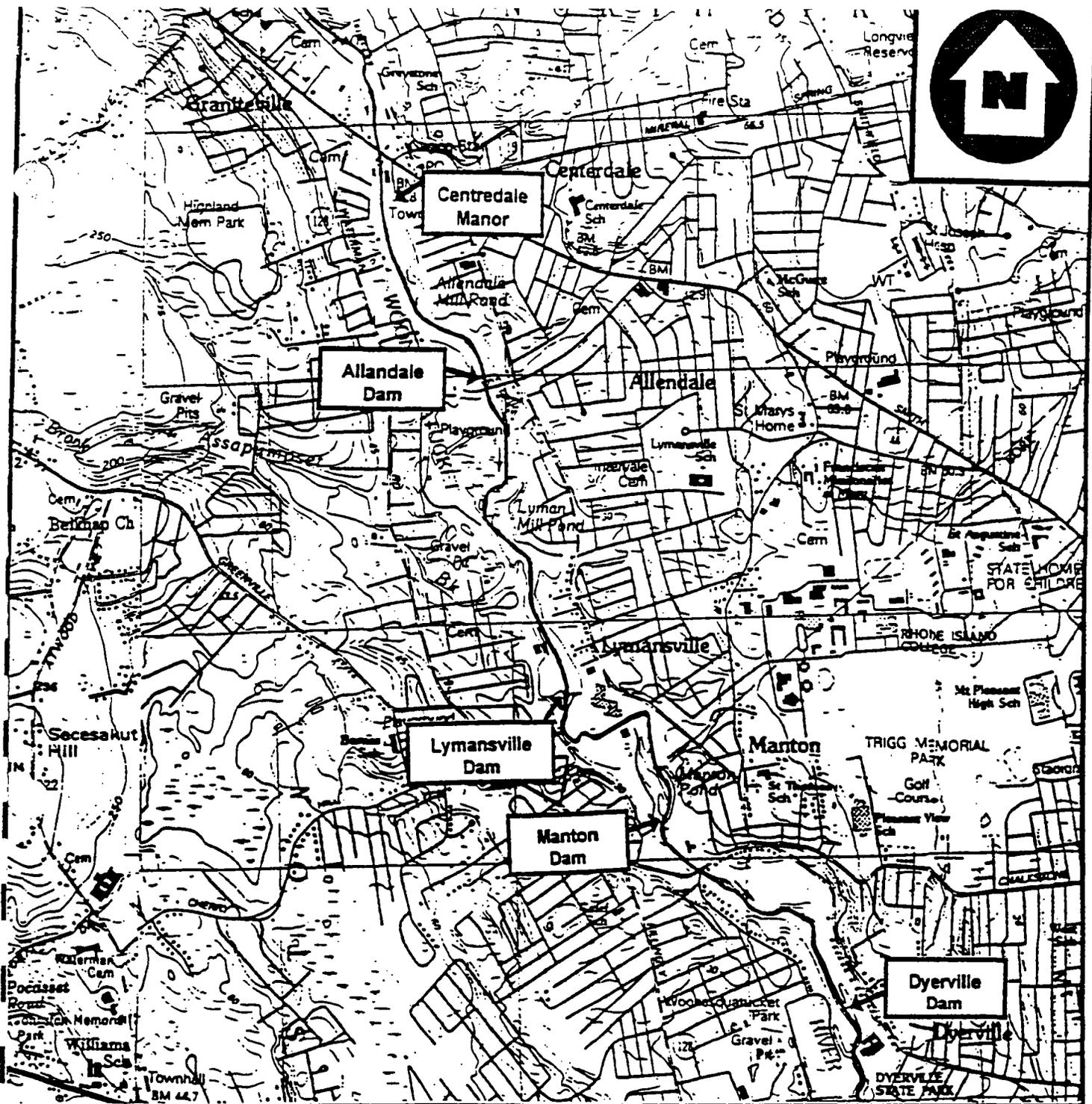
LOCATION MAP
 WOONASQUATUCKET RIVER (NORTH)
 CENTREDALE MANOR SITE
 2074 SMITH STREET
 NORTH PROVIDENCE, RHODE ISLAND



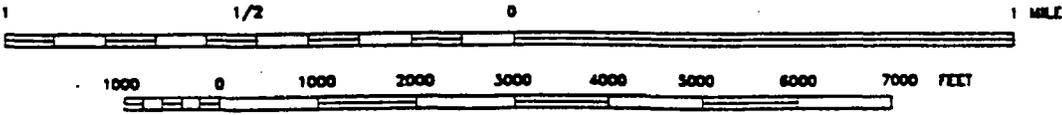
REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD #	DRAWN BY:	DATE
98-06-0017	W. SHAW	8/17/98

FILE NAME:	FIGURE 1A
S:\98060017\FIG1A	



BASE MAP IS A PORTION OF THE FOLLOWING 7.5 X 15' MINUTE U.S.G.S. QUADRANGLE(S):
 PROVIDENCE, RI 1987; NORTH SCITUATE, RI 1955 (PHOTOREVISED 1970 AND 1975)



LOCATION MAP
 WOONASQUACKET RIVER (CENTRAL)
 CENTREDALE MANOR SITE
 2074 SMITH STREET
 NORTH PROVIDENCE, RHODE ISLAND

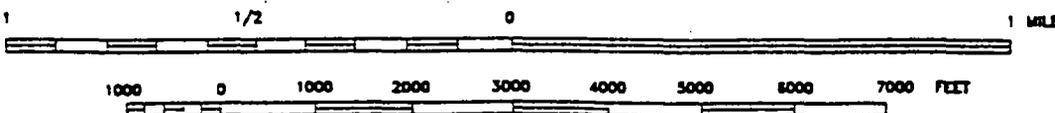


REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD # 98-06-0017	DRAWN BY: W. SHAW	DATE 8/17/98
FILE NAME: S:\98060017\FIG1B		FIGURE 1B



BASE MAP IS A PORTION OF THE FOLLOWING 7.5 X 15' MINUTE U.S.G.S. QUADRANGLE(S):
 PROVIDENCE, RI 1987



QUADRANGLE LOCATION

LOCATION MAP
 WOONASQUACKET RIVER (SOUTH)
 CENTREDALE MANOR SITE
 2074 SMITH STREET
 NORTH PROVIDENCE, RHODE ISLAND

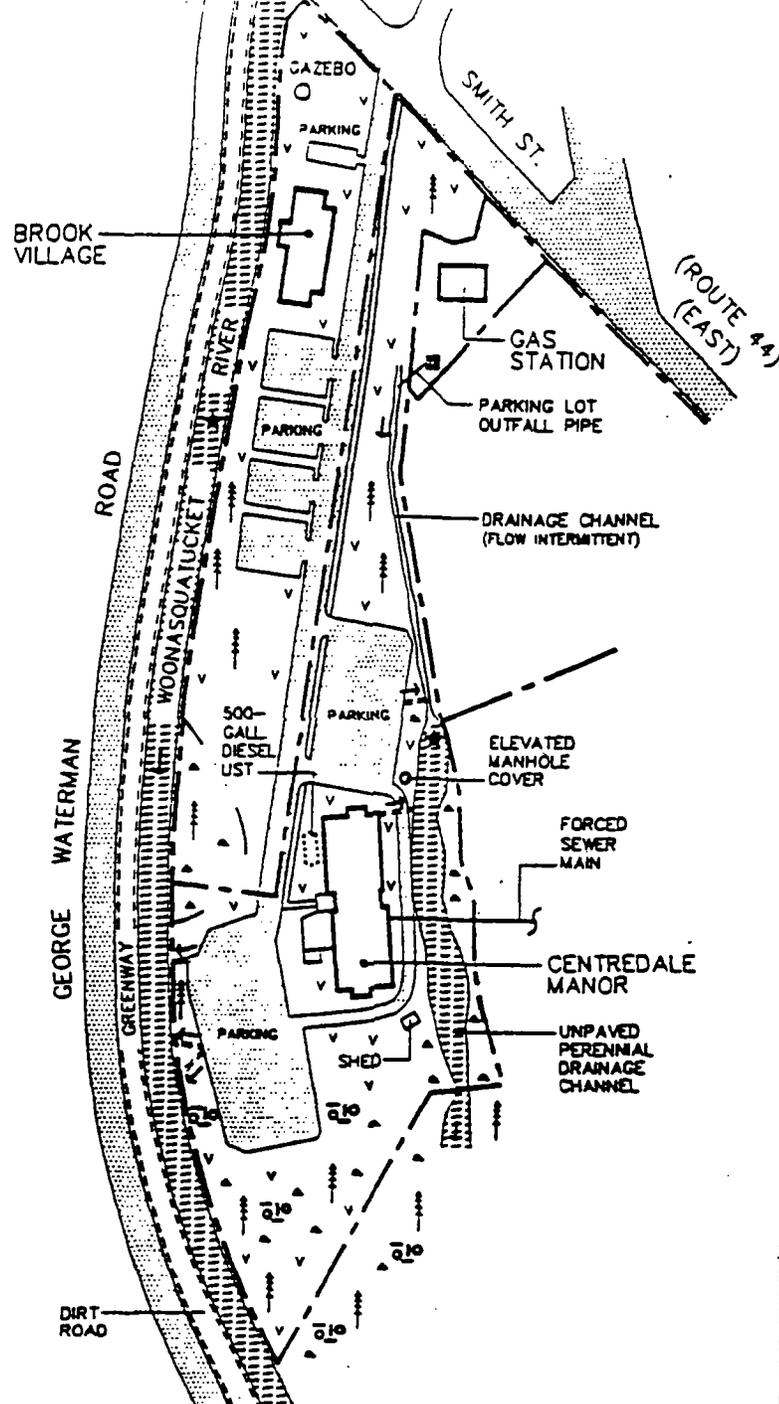
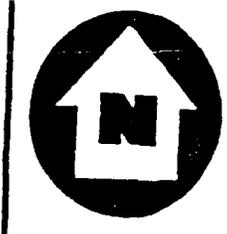


REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD # 98-06-0017	DRAWN BY: W. SHAW	DATE 8/17/98
---------------------	----------------------	-----------------

FILE NAME:
S:\980600\7\FIG1C

FIGURE 1C



SOURCES:
 NORTH PROVIDENCE TAX ASSESSORS
 PLAT MAP - PLAT NO. 14
 DECEMBER 1992, REVISED DECEMBER 1994
 WESTON/START FIELD BOOK NO. 00343-S
 FOR CENTREDALE MANOR - 1998
 NOT TO SCALE

LEGEND

- SURFACE WATER
- FLOW DIRECTION
- DRUM, DEBRIS, OR METAL FRAGMENTS
- GRASS
- PROPERTY LINE
- PAVED DRAINAGE SWALE
- PAVED AREAS
- WETLANDS
- UNDERGROUND STORAGE TANK (UST)
- WOODED AREA
- CATCHBASIN
- PROBABLE POINT OF ENTRY TO SURFACE WATER PATHWAY
- INTERMITTENT STREAM (DURING FLOOD PERIODS)

SITE SKETCH

CENTREDALE MANOR PROPERTY
 CENTREDALE MANOR SITE
 2074 SMITH STREET
 NORTH PROVIDENCE, RHODE ISLAND



REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD # 98-06-0017	DRAWN BY: W. SHAW	DATE 3/9/99
---------------------	----------------------	----------------

FILE NAME: S:\98060017\FIG2	FIGURE 2
--------------------------------	----------

An eight-story apartment building housing approximately 135 elderly and handicapped residents, known as Centredale Manor, which was constructed in February 1982, currently occupies the property. Two paved parking lots are located to the north and west of the building (Figure 2). The areas around the parking lots and the building are landscaped with a grass ground cover. A 500-gallon underground storage tank (UST) containing diesel fuel is located approximately 100 feet west of the building. The tank is leak tested biannually and has reportedly not failed integrity testing to date [1, p. 3].

The highest elevation on the property is approximately 200 feet above mean sea level and located in the central portion of the property. Topography on the property is relatively flat with a downward slope to the east, towards the drainage channel. During the ESI on-site reconnaissance, areas of stressed vegetation were observed on the northwest side of the property between the Centredale Manor and Brook Village parking lots and in the southern portion of the property along the overland flow route between on-site paved areas and the Woonasquatucket River [3].

The majority of residences and businesses in the vicinity of the property are served by the City of Providence public water supply system [8]. The nearest public drinking water supply well to the Centredale Manor property is located 0.8 miles to the west of the property at the Pied Piper Nursery School and serves an estimated 130 people. An estimated 1,351 people are served by public drinking water wells within 4-radial miles of the property. Approximately 8,130 people are served by private drinking water wells within 4-radial miles of the property. The nearest private drinking water well to the Centredale Manor property is the Yacht Club Bottling Works, Inc., located approximately 0.12 miles northeast of the property [1, pp. 3, 12].

The Centredale Manor Site is located in the Woonasquatucket Regional River Basin. An undefined overland flow route exists for precipitation that falls on the property. As a result, run-off from the property travels as sheet flow into either the Woonasquatucket River or the drainage channel. The most upstream probable points of entry (PPEs) from sheet flow are located adjacent to the Brook Village building (along the Woonasquatucket River) and in the drainage channel located east of the Centredale Manor building (Figure 2). From the drainage channel PPE, the surface water travels along the eastern perimeter of the property and converges with the Woonasquatucket River approximately 0.3 miles downstream of the property. The mean annual flow rate of the drainage channel is estimated to be 5 cubic feet per second (cfs). The drainage channel is not known to be a fishery [1, p. 14].

From the Woonasquatucket River PPE, surface water travels approximately 0.1 miles along the western perimeter of the property, reaches the confluence with the drainage channel 0.3 miles south of the property and travels south for approximately 5.7 miles before discharging into the Providence River. The Providence River continues south approximately 8 miles before discharging into the Narragansett Bay. The mean annual flow rate of the Woonasquatucket River in the vicinity of the property is estimated to be 73 cfs based on historical flow rate information from a gaging station located 0.1 miles north of the property. The Providence River and Narragansett Bay are tidally influenced [1, p. 14].

There are also two defined surface water overland flow routes on the property. A number of paved drainage swales exist to divert overland flow to either the drainage channel or to the Woonasquatucket River (Figure 2) [1, p. 16].

OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS

In 1936, Centredale Worsted Mills sold the property on which Centredale Manor is located (Lot 250) to Olneyville Wool Combing Company. In 1940, the Olneyville Wool Combing Company sold Lot 250 to three individuals (H. Sweet, W. Clark, and M. Sweet). In April 1943, these three individuals sold Lot 250 to two different individuals (H. Bonino, and J. Buonanno), who owned it for three months before transferring it to Centredale Enterprises, Inc., in July of 1943. Centredale Enterprises, Inc. held title to Lot 250 until 1971, when it was sold to two individuals (J. Buonanno and E. Ricci) and one business entity (Centredale Properties Corporation). Centredale Properties Corporation sold its interest in Lot 250 to J. Buonanno and E. Ricci in 1979. They held title until 1982, when Lot 250 was sold to Centredale Manor Associates. Centredale Manor Associates sold Lot 250 to the Cornerstone Corporation in 1995 [9].

No information regarding the types of textile activities conducted on the property by either the Centredale Worsted Mill or the Olneyville Wool Combing Company was found in available file information. These companies operated on the property during the 1930s through the mid-1940s [1, p. 5].

A chemical manufacturing facility (Atlantic Chemical Company, Inc., which changed its name in 1953 to Metro-Atlantic, Inc.) and a drum recycling facility (New England Container Co., Inc.) reportedly operated at the property between 1943 and 1971. Additional information regarding operations at these facilities is currently being sought by EPA. In the mid-1970s, the existing buildings at the property were demolished. Further information regarding the demolition of the buildings is also being sought by EPA [9].

In October and November 1977, the Rhode Island Department of Health (RI DOH) conducted several investigations at the Centredale Manor property in response to complaints of odors and fumes at the property. Approximately 60 55-gallon drums were found on the property in a swampy area near the Woonasquatucket River. A bluish-white smoke was observed in association with an unknown number of ruptured drums, reportedly containing sulfuric acid. On 10 November 1977, Acme Services removed 10 drums which reportedly contained sulfuric acid from the swampy area. No information regarding where the drums were transported and/or disposed of was available. The remaining drums were reportedly left on the property [1, p. 5].

From December 1979 to March 1981, RI DEM periodically inspected the property. During these inspections, RI DEM observed and inventoried approximately 400 drums. The drums were reported to be in various stages of deterioration. An unknown number of drums were found to contain residual solid and liquid material. Legible drum labels and visual inspection of residual materials indicated that caustics, halogenated solvents, polychlorinated biphenyls (PCBs), and ink wastes (potentially containing heavy metals) may have been contained in the drums. During the inspections, approximately 150 drums (of the 400 drums) were observed scattered along the bank of the Woonasquatucket River [1, p. 5].

In 1981, Marshall Contractors, Inc. (Marshall) and Robinson, Green and Beretta, Inc. performed a feasibility study of the property for the property owners, J. Buonanno and E. Ricci. The

feasibility study was conducted to investigate the potential commercial development of the property as an apartment complex. In October 1981, Marshall reportedly discovered a smoking drum of sulfuric acid. On 16 October 1981, Jet-Line Services manifested, removed, and transported the drum of sulfuric acid to an approved disposal facility. The Jet-Line Services drum removal activities were supervised by Marshall and RI DEM [1, p. 5].

On 23 November 1981, a Notice of Violation and Order (Order) was issued by RI DEM to the property owners, J. Buonanno and E. Ricci, for violations of the State Hazardous Waste Management Act [1, p. 6]. The Order indicates that various State rules and regulations, including the following, were violated:

- Hazardous Waste Management Facility Operating Permit Rules and Regulations-Landfills
- Hazardous Waste Generator Rules and Regulations
- Hazardous Waste Treatment and Storage Rules and Regulations
- Hazardous Waste Operating Permit Rules and Regulations-Landfills

The 1981 Order required that the owners of the property, J. Buonanno and E. Ricci, complete the following activities: 1) identify all hazardous materials on site by sampling and chemical analysis; 2) repackage and properly manifest and dispose of all hazardous wastes on site; 3) comply with items 1 and 2 immediately [9].

In February 1982, Marshall oversaw the characterization of soils at the Centredale Manor property with supervision by RI DEM. On 2 February 1982, Guild Drilling collected two composite soil samples from 10 soil borings advanced in the proposed apartment building construction area. The samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and eight extraction procedure for toxicity (EP TOX) metals to determine if soils in the construction area would be considered hazardous waste. Analyses of soil samples indicated the presence of chloroform, toluene, trichloroethylene, bis(2-ethylhexyl)phthalate, and barium at concentrations below the then current (1982) RI DEM regulatory levels. Ultimately, 6,000 cubic yards of excavated soil were removed and disposed of as non-hazardous solid waste [1, p. 6].

On 22 February 1982, C. Pezza and Sons, Inc. excavated and staged approximately 400 drums on the property under the supervision of RI DEM. Drums which were verified to be empty were crushed and sent to a solid waste facility for disposal as non-hazardous waste. Approximately 30 drums with residual materials were stockpiled on the property [1, p. 6].

On 27 February 1982, Goldberg, Zoino & Associates, Inc. (GZA), under contract to Marshall and being supervised by RI DEM, collected eight composite samples from stockpiled drums which contained chemical residues. The drums were categorized, separated, and composited for sampling based on similar contents. Samples were analyzed for VOCs and eight EP TOX metals. Analyses of the drum samples indicated the presence of xylene, toluene, ethyl benzene, cadmium, chromium, lead, and silver at concentrations ranging from 0.21 parts per million (ppm) to 47,000 ppm. Based on these analyses, eight of the 30 drums with residual materials were reported to contain hazardous materials. On 2 June 1982, Jet-Line Services transported the eight drums off

site for disposal at an approved facility. The remaining drums were disposed of as non-hazardous solid waste [1, p. 6].

In 1982, construction of the Centredale Manor complex was completed. A Fresh Water Wetland Applicability Determination, required for the construction of the complex, concluded that the construction of Centredale Manor represented an insignificant alteration of the nearby fresh water wetland located on the western side of the property adjacent to the Woonasquatucket River [1, p. 6].

In 1986, RI DEM received information from the Providence Journal which indicated that several 5,000-gallon USTs used to store hazardous waste were buried on the Centredale Manor property. A ground-penetrating radar survey was conducted by Geo-Centers, Inc. on 24 March 1986, to locate the alleged buried USTs. The survey concluded that there were no buried USTs on the property; however, other metallic debris, possibly buried drums, were potentially present along the western edge of the property [1, p. 6].

On 21 August 1986, NUS/FIT completed an EPA PA of the Centredale Manor property. Based on the previous history of the property, NUS/FIT concluded that groundwater, surface water, soil, and sediment at the property were potentially impacted. Based on the findings of the PA, an SSI was recommended [1, p. 7].

On 15 October 1990, an EPA SSI for Centredale Manor property was completed by NUS/FIT. As part of this investigation, on 27 March 1990, NUS/FIT collected 10 soil samples, including one trip blank, one duplicate/replicate, and one reference sample from the Centredale Manor property. The soil samples were analyzed through the EPA Contract Laboratory Program (CLP) for VOCs, SVOCs, pesticide/PCB, and metals analyses. The trip blank was analyzed for VOCs only. A total of six VOCs and 29 SVOCs were detected, including the compound 4-chloroaniline at a concentration of 32,000 parts per billion (ppb) in the samples submitted for analysis. 4-Chloroaniline is commonly found in dyes used in textile mill operations and may be related to the mills which occupied the property in the 1930s and 1940s. Four pesticides, two PCB congeners (Aroclors 1242 and 1254), and six inorganic elements were also detected in the NUS/FIT soil samples [1, p. 7].

On 10 September 1994, RI DEM collected surface water samples from the Woonasquatucket River. These samples were collected to determine the impact of a cyanide spill which occurred upstream of the property. One sample was collected from the Woonasquatucket River adjacent to the Centredale Manor property. Laboratory analyses detected elevated concentrations of cadmium, copper, cyanide, lead, and nickel at concentrations ranging from 8 ppb and 250 ppb. No known reference or quality assurance/quality control (QA/QC) samples were collected [1, p. 7]. RI DEM did not conduct dioxin analysis on these samples [9].

Approximately ten deteriorated empty 55-gallon drums were observed on 4 October 1995 during the WESTON on-site reconnaissance of the property which was conducted as part of the EPA SIP investigation of the property. The drums were located along the Woonasquatucket River and in the southern wooded area within 200 feet of the building [1, p. 7].

As part of the EPA SIP, WESTON personnel collected sediment samples on 27 March 1996. Nine sediment samples, including three reference samples, were collected from eight locations associated with the property. The sediment samples were analyzed through EPA CLP for VOCs, SVOCs, pesticide/PCB, total metals, and cyanide analyses. Three sediment samples were collected from the Woonasquatucket River and six sediment samples were collected from wetlands along the drainage channel [1, p. 7].

Analytical results of 1996 WESTON sediment samples indicated the presence of several VOCs, SVOCs, and inorganic elements at concentrations greater than or equal to three times the reference sample concentrations. No pesticides or PCBs were detected in the sediment samples [1, pp. 19 - 21]. WESTON did not conduct dioxin analysis of these samples as part of this EPA SIP [9].

Two VOCs were detected in samples collected from wetlands located on the southeast portion of the property along the drainage channel. 2-Butanone and chlorobenzene were detected at 21 ppb and 11 ppb, respectively. Thirteen SVOCs were detected in sediment samples ranging from 350 ppb to 8,500 ppb. The SVOCs detected in WESTON sediment samples were primarily polynuclear aromatic hydrocarbons (PAHs) [1, p. 21].

Ten inorganic elements were also detected in sediment samples ranging from 1.7 ppm to 20,000 ppm. Many of the elements and compounds detected in sediment samples were also previously detected in NUS/FIT soil samples above reference concentrations and in samples collected from drums removed from the property in 1982. This indicates that previous on-site disposal practices may have impacted the surface water quality downstream of the Centredale Manor property [1, p. 22].

In June 1996, fish were collected from the Woonasquatucket River and fish tissue samples were analyzed by EPA Narragansett Laboratory and Providence Urban Initiative personnel. The fish tissue samples were analyzed for cadmium, copper, chromium, nickel, lead, zinc, mercury, PCB congeners, hexachlorobenzene, DDE, DDD, DDT, lindane, chlordane, nonachlor, and dioxin homologues [2, Appendix B]. Based on elevated dioxin levels detected in fish tissue samples, a fish consumption advisory was issued by RI DOH [2, p. 1].

In January 1997, the EPA Office of Ecosystem Protection and the Rhode Island State Program requested assistance from the EPA Office of Environmental Measurement and Evaluation (OEME) to examine and evaluate ambient sediment quality in the Woonasquatucket River and to identify sources that may have caused the elevated concentrations of contaminants in fish tissue [2, p. 1].

In October 1997, OEME personnel conducted water and sediment sampling. Sediment and water column measurements were collected at seven dam locations along the Woonasquatucket River. The area investigated extended from the Esmond Dam area of North Providence, to just upstream of the Valley Street Bridge in Providence (Figure 1). Dioxin contamination was detected at all seven sampling locations. Dioxin levels in the sediment samples at two dams, Allendale Dam and Lymanville Dam, were significantly higher than at the other sediment sampling locations [2, p. 2].

According to the 1997 OEME report, numerous PAHs, chlorinated pesticides, PCBs, and inorganic elements were also detected at all seven locations at concentrations that may pose a chronic risk to the benthic community as well as upper food chain receptors. In addition, because of the biomagnification potential of dioxin and, based on New York Department of Environmental Conservation sediment guidelines that take into consideration upper food chain impacts, as well as the total organic carbon (TOC) values present in the river, the possibility of acute effects to piscivorous (fish consumers) is also present [2, pp. 2-3].

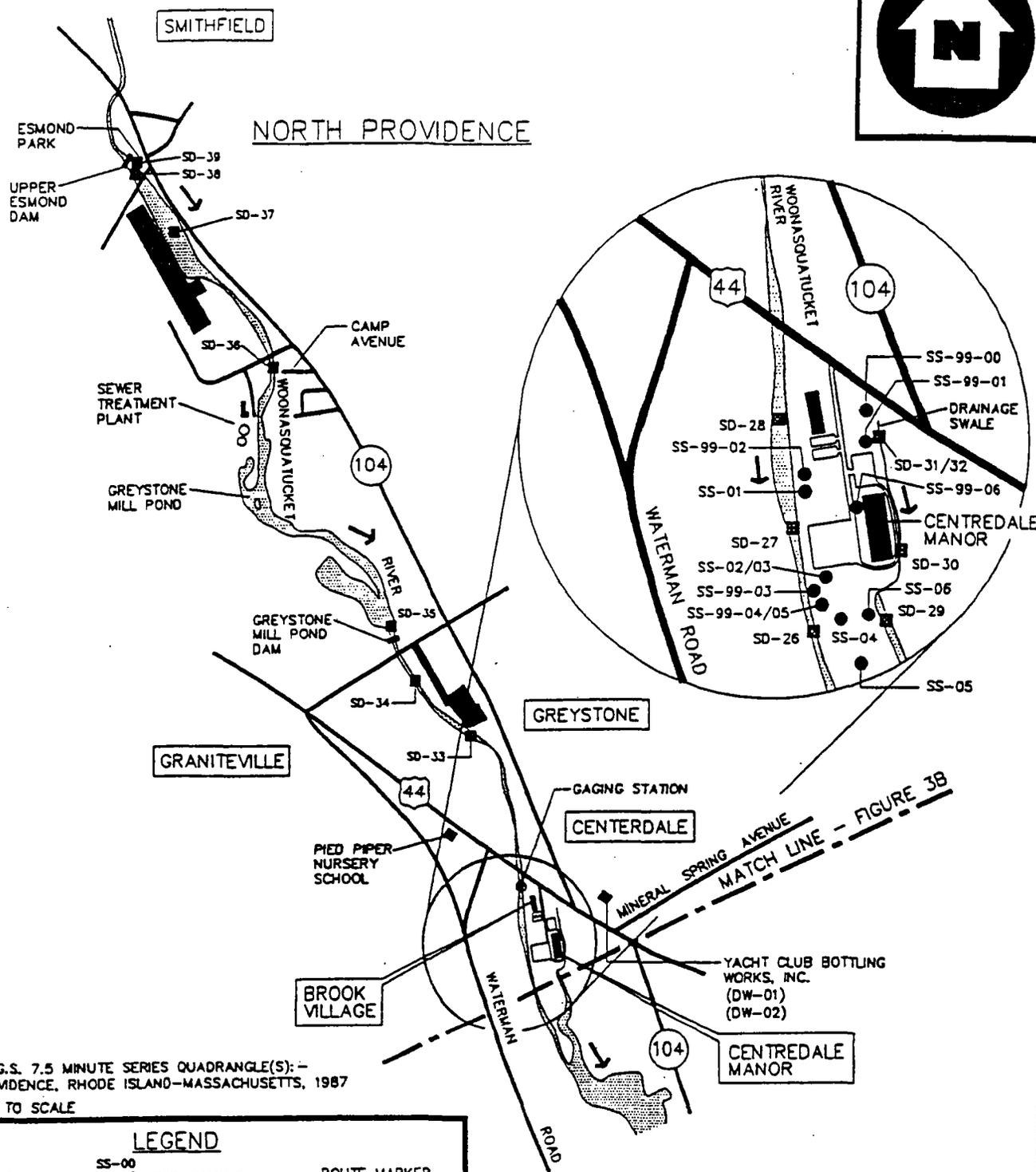
In June 1998, START initiated an ESI of the Centredale Manor Site under direction of EPA. The ESI was initiated to assess: the presence of dioxin/furan and hexachloroxanthene (HCX) contamination on the Centredale Manor property; the extent of contamination in areas of potential human exposure; and potential source areas located upstream of the Centredale Manor property. No prior analysis for the presence of dioxin and HCX had been performed on the Centredale Manor property.

On 31 July 1998, START personnel performed an on-site reconnaissance to identify soil and sediment sampling locations on the Centredale Manor and Brook Village properties and along the Woonasquatucket River between the Esmond Dam area of North Providence, to Waterplace Park in Providence. The investigation covers an area of approximately 10.0 stream miles along the Woonasquatucket River [3].

On 9 September 1998, START personnel collected five soil samples from the Centredale Manor property, one soil sample from the Brook Village property, 35 sediment samples from the Woonasquatucket River, and four sediment samples from the drainage channel. All sampling activities were conducted in accordance with the EPA approved Task Work Plan, dated 31 August 1998. The soil and sediment samples were submitted to the EPA Region VII laboratory for dioxin and HCX analyses, to an EPA CLP laboratory for SVOC and pesticide/PCB analyses, and to a Delivery of Analytical Services (DAS) laboratory for TOC analysis. Sample locations are depicted on Figures 3A, 3B, and 3C and described in Table 1.

Complete analytical results of START soil samples including quantitation and detection limits are presented in Attachment A (for SVOCs and pesticides/PCBs), Attachment B (for dioxins and hexachloroxanthene), and Attachment C (for TOCs). Sample results quantified with a "J" on analytical tables are considered approximate because of limitations identified during CLP and DAS data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate.

Results for soil samples collected from the Centredale Manor Site which exceed the RI DEM (1996) Residential Direct Exposure Criteria (RI DEC) values are summarized in Table 2. Substances for which no RI DEC values have been established (i.e. carbazole, endosulfan sulfate, 4-methylphenol, isophrone, di-n-butylphthalate, dibenzofuran, butylbenzylphthalate, 4,4'-DDD, 4,4'-DDE, beta-BHC, and heptachlor) are not included in Table 2, but are presented in Attachment A [10]. For comparative purposes, dioxin results are compared to the EPA Region I Dioxin Residential Action Level of 1 ppb. In addition, HCX results are listed; however, no benchmark value is available.



SOURCE: U.S.G.S. 7.5 MINUTE SERIES QUADRANGLE(S): -
 PROVIDENCE, RHODE ISLAND-MASSACHUSETTS, 1987
 NOT TO SCALE

LEGEND		
SD-00	■ SEDIMENT SAMPLE LOCATION (9/9/98)	● SOIL SAMPLE LOCATION (9/9/98)
→	FLOW DIRECTION	● SOIL SAMPLE LOCATION (1/15/99)
■	BUILDING	ROUTE MARKER
		□ U.S. ROUTE
		○ STATE ROUTE

SAMPLE LOCATION MAP

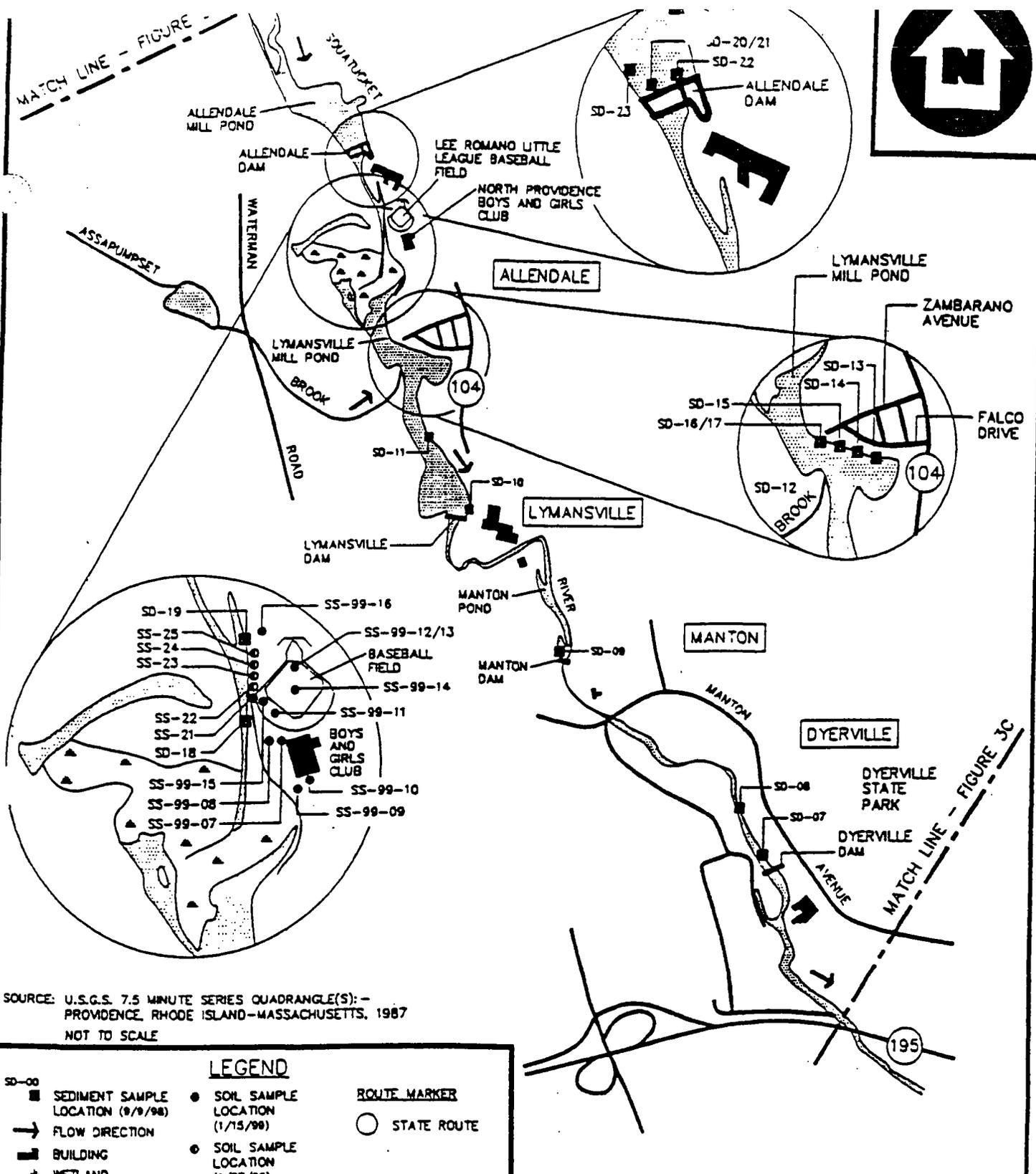
WOONASQUATUCKET RIVER (NORTH)
 CENTREDALE MANOR SITE
 2074 SMITH STREET
 NORTH PROVIDENCE, RHODE ISLAND



REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD # 98-06-0017	DRAWN BY: W. SHAW	DATE 8/14/98
---------------------	----------------------	-----------------

FILE NAME: S:\98060017\FIG1CX	FIGURE 3A
----------------------------------	-----------



SOURCE: U.S.G.S. 7.5 MINUTE SERIES QUADRANGLE(S) - PROVIDENCE, RHODE ISLAND-MASSACHUSETTS, 1987
NOT TO SCALE

LEGEND

- | | | | |
|-------|-------------------------------------|----------------------------------|----------------|
| SD-00 | ■ SEDIMENT SAMPLE LOCATION (9/9/98) | ● SOIL SAMPLE LOCATION (1/13/99) | — ROUTE MARKER |
| → | → FLOW DIRECTION | ○ SOIL SAMPLE LOCATION (1/27/99) | ○ STATE ROUTE |
| ■ | ■ BUILDING | | |
| ▲ | ▲ WETLAND | | |

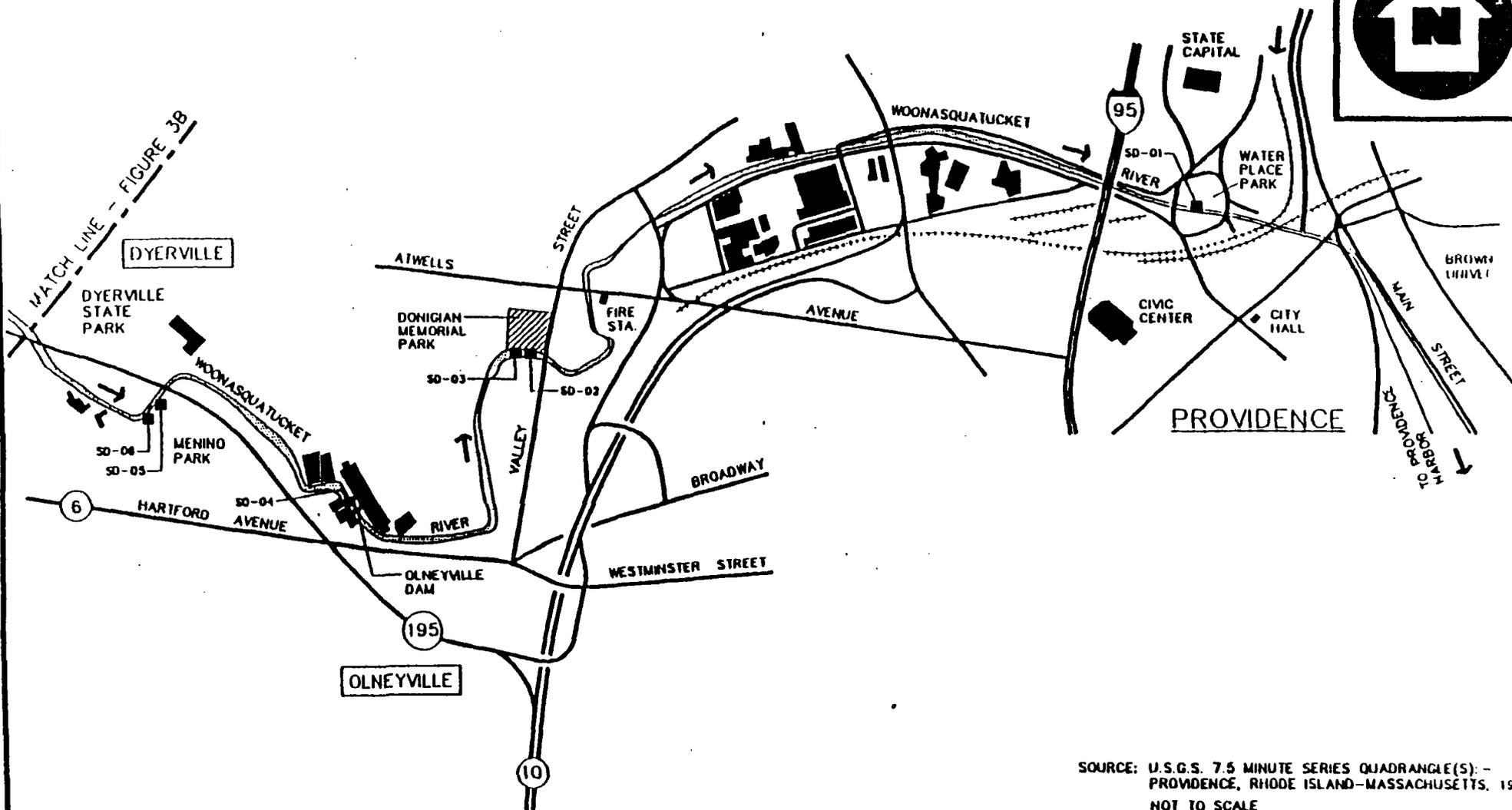
SAMPLE LOCATION MAP

WOONASQUATUCKET RIVER (CENTRAL)
CENTREDALE MANOR SITE
2074 SMITH STREET
NORTH PROVIDENCE, RHODE ISLAND



REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD # 98-06-0017	DRAWN BY: W. SHAW	DATE 8/14/98
FILE NAME: S:\98060017\FIG1BX		FIGURE 3B



SOURCE: U.S.G.S. 7.5 MINUTE SERIES QUADRANGLE(S) - PROVIDENCE, RHODE ISLAND-MASSACHUSETTS, 198; NOT TO SCALE

LEGEND

- SD-00 SEDIMENT SAMPLE LOCATION (9/9/90)
- FLOW DIRECTION
- BUILDING
- RAILROAD TRACKS
- ROUTE MARKER**
- INTERSTATE HIGHWAY
- STATE ROUTE

SAMPLE LOCATION MAP

WOONASQUATUCKET RIVER (SOUTH)
 CENTREDALE MANOR SITE
 2074 SMITH STREET
 NORTH PROVIDENCE, RHODE ISLAND



REGION I SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

TDD # 98-06-0017	DRAWN BY: W. SHAW	DATE 8/14/98
FILE NAME: S:\98060017\FIG1AX		FIGURE 3C

A total of eight SVOCs and one pesticide (dieldrin) were detected in various soil samples above the respective RI DEC values. Dioxin results exceeded the EPA Region I Residential Action Level for dioxin (1 ppb) at four sample locations and ranged from 3.0 J ppb to 6.3 J ppb. In regards to soil samples collected, the greatest number of SVOCs and the highest concentrations of SVOCs and dioxin were detected in soil sample SS-04 (Figure 3A) [4; 7].

Table 1

Sample Summary: Centredale Manor Site
Samples Collected by START on 9 September 1998

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth (Inches)	Sample Coordinates
MATRIX: Soil					
SS-01	APA72 DAFZ73 AAL24-001	0920	Grab	3 to 12	41° 51' 23.5" north 71° 29' 12.5" west
SS-02	APA73 DAFZ74 AAL24-002	0950	Grab	0 to 16	41° 51' 18.7" north 71° 29' 9.9" west
SS-03	APA74 DAFZ75 AAL24-003	1005	Grab	30 to 42	41° 51' 18.7" north 71° 29' 9.9" west
SS-04	APA75 DAFZ76 AAL24-004	1050	Grab	0 to 18	41° 51' 17.9" north 71° 29' 9.5" west
SS-05	APA76 DAFZ77 AAL24-005	1130	Grab	0 to 18	41° 51' 17.7" north 71° 29' 8.2" west
SS-06	APA77 DAFZ78 AAL24-006	1110	Grab	0 to 24	42° 51' 18.2" north 71° 29' 7.7" west
MATRIX: Sediment					
SD-01 (MS/MSD)	APA78 DAFZ79 AAL24-007	0819	Grab	0 to 6	41° 49' 37.7" north 71° 24' 50.6" west
SD-02	APA79 DAFZ80 AAL24-008	0835	Grab	0 to 3	41° 49' 21.4" north 71° 26' 25.0" west
SD-03	APA80 DAFZ81 AAL24-009	0850	Grab	0 to 3	41° 49' 21.2" north 71° 26' 30.0" west

Table 1

Sample Summary: Centredale Manor Site
Samples Collected by START on 9 September 1998
(Continued)

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth (Inches)	Sample Coordinates
MATRIX: Sediment (Continued)					
SD-04	APA81 DAFZ82 AAL24-010	0900	Grab	0 to 6	41° 49' 6.3" north 71° 26' 56.5" west
SD-05	APA82 DAFZ83 AAL24-011	0938	Grab	0 to 6	41° 49' 15.3" north 71° 27' 18.0" west
SD-06	APA83 DAFZ84 AAL24-012	0950	Grab	0 to 6	41° 49' 13.9" north 71° 27' 19.4" west
SD-07	APA84 DAFZ85 AAL24-013	0955	Grab	0 to 6	41° 49' 40.4" north 71° 27' 47.4" west
SD-08	APA85 DAFZ86 AAL24-014	1022	Grab	0 to 3	41° 49' 47.5" north 71° 27' 52.3" west
SD-09	APA86 DAFZ87 AAL24-015	1036	Grab	0 to 6	41° 50' 6.5" north 71° 28' 21.2" west
SD-10	APA87 DAFZ88 AAL24-016	1115	Grab	0 to 6	41° 50' 22.4" north 71° 28' 35.9" west
SD-11	APA88 DAFZ89 AAL24-017	1135	Grab	0 to 12	41° 50' 33.3" north 71° 28' 43.4" west
SD-12	APA89 DAFZ90 AAL24-018	1238	Grab	0 to 12	41° 50' 41.3" north 71° 28' 50.9" west
SD-13	APA90 DAFZ91 AAL24-019	1215	Grab	0 to 12	41° 50' 41.4" north 71° 28' 43.1" west
SD-14	APA91 DAFZ92 AAL24-020	1230	Grab	0 to 6	41° 50' 41.8" north 71° 28' 44.7" west

Table 1

Sample Summary: Centredale Manor Site
 Samples Collected by START on 9 September 1998
 (Continued)

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth (Inches)	Sample Coordinates
MATRIX: Sediment (Continued)					
SD-15	APA92 DAFZ93 AAL24-021	1250	Grab	0 to 6	41° 50' 42.3" north 71° 28' 46.0" west
SD-16	APA93 DAFZ94 AAL24-022	1315	Grab	0 to 6	41° 50' 42.8" north 71° 28' 48.3" west
SD-17	APA94 DAFZ95 AAL24-023	1315	Grab, Duplicate of SD-16	0 to 6	41° 50' 42.8" north 71° 28' 48.3" west
SD-18 (MS/MSD)	APA95 DAFZ96 AAL24-024	1155	Grab	0 to 3	41° 50' 57.0" north 71° 28' 49.7" west
SD-19	APA96 DAFZ97 AAL24-025	1110	Grab	0 to 3	41° 50' 53.7" north 71° 28' 49.8" west
SD-20	APA97 DAFZ98 AAL24-026	1406	Grab	0 to 3	41° 51' 3.9" north 71° 28' 54.8" west
SD-21	APA98 DAFZ99 AAL24-027	1415	Grab	6 to 25	41° 51' 3.9" north 71° 28' 59.8" west
SD-22	APA99 DAF01A AAL24-028	1411	Grab	0 to 3	41° 51' 4.2" north 71° 28' 53.2" west
SD-23	APB00 DAF02A AAL24-029	1355	Grab	0 to 3	41° 50' 4.4" north 71° 28' 56.2" west
SD-24	APB01 DAF03A AAL24-030	1356	Grab	0 to 3	41° 51' 6.8" north 71° 28' 53.9" west
SD-25	APB02 DAF04A AAL24-031	1356	Grab, Duplicate of SD-24	0 to 3	41° 51' 6.8" north 71° 28' 53.9" west

Table 1

Sample Summary: Centredale Manor Site
 Samples Collected by START on 9 September 1998
 (Continued)

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth (Inches)	Sample Coordinates
MATRIX: Sediment (Continued)					
SD-26	APB03 DAF05A AAL24-032	1320	Grab	0 to 6	41° 51' 17.7" north 71° 29' 10.1" west
SD-27	APB04 DAF06A AAL24-033	1420	Grab	0 to 6	41° 51' 23.8" north 71° 29' 13.4" west
SD-28	APB05 DAF07A AAL24-034	1450	Grab	0 to 6	41° 51' 28.7" north 71° 29' 13.5" west
SD-29	APB06 DAF08A AAL24-035	1350	Grab	0 to 6	41° 51' 18.0" north 71° 29' 7.6" west
SD-30	APB07 DAF09A AAL24-036	1415	Grab	0 to 6	41° 51' 21.2" north 71° 29' 8.4" west
SD-31	APB08 DAF10A AAL24-037	1435	Grab	0 to 6	41° 51' 28.1" north 71° 29' 11.0" west
SD-32	APB09 DAF11A AAL24-038	1435	Grab, Duplicate of SD-31	0 to 6	41° 51' 28.1" north 71° 29' 11.0" west
SD-33	APB10 DAF12A AAL24-039	1515	Grab	0 to 3	41° 51' 47.4" north 71° 29' 21.5" west
SD-34	APB11 DAF13A AAL24-040	1520	Grab	0 to 3	41° 51' 48.6" north 71° 29' 25.1" west
SD-35 (MS/MSD)	APB12 DAF14A AAL24-041	1526	Grab	0 to 3	41° 51' 58.9" north 71° 29' 35.8" west
SD-36	APB13 DAF15A AAL24-042	1546	Grab	0 to 3	41° 52' 23.2" north 71° 29' 48.7" west

Table 1

Sample Summary: Centredale Manor Site
Samples Collected by START on 9 September 1998
(Concluded)

Sample Location No.	Traffic Report No.	Time (hours)	Remarks	Sample Depth (Inches)	Sample Coordinates
MATRIX: Sediment (Concluded)					
SD-37	APB17 DAF16A AAL24-043	1547	Grab	0 to 6	41° 52' 36.7" north 71° 29' 59.9" west
SD-38	APB18 DAF17A AAL24-044	1600	Grab	0 to 6	41° 52' 44.0" north 71° 30' 6.2" west
SD-39	APB19 DAF18A AAL24-045	1602	Grab	0 to 3	41° 52' 44.1" north 71° 30' 7.0" west
MATRIX: Aqueous					
RB-01	APB20 DAF19A	1250	Grab	NA	NA
Matrix: Performance Evaluation Samples					
PE-503338	APB24	0500	SVOC	NA	NA
PE-501151	APB25	0500	SVOC	NA	NA
PE-501688	APB26	0500	SVOC	NA	NA
PE-0023053	APB27	0500	Pest/PCB	NA	NA
PE-0021565	APB28	0500	Pest/PCB	NA	NA
PE-0000466	APB29	0500	Pest/PCB	NA	NA
PE-TT03728	APB30	0500	Aroclor 1260	NA	NA
PE-TT01048	APB31	0500	Aroclor 1260	NA	NA
PE-TT00153	APB32	0500	Aroclor 1260	NA	NA

MS/MSD = Matrix Spike/Matrix Spike Duplicate
 NA = Not Applicable
 SVOC = Semivolatile Organic Compound
 Pest/PCB = Pesticide/Polychlorinated Biphenyl

[3]

Table 2

**Soil Sample Results from Centredale Manor Site
Above Residential Direct Exposure Criteria**

Sample Location	Compound	Sample Concentration	Direct Exposure Criteria* (Residential)
SS-01 (APA72) (DAFZ73) (AAL24-001)	SVOCs		
	Chrysene	0.420 J mg/kg	0.4 mg/kg
	Benzo(a)pyrene	0.460 mg/kg	0.4 mg/kg
	DIOXINS		
	Dioxins [†]	R ppb	1.0 ppb
	Hexachloroxanthene	R ppb	NA
SS-02 (APA73) (DAFZ74) (AAL24-002)	SVOCs		
	Chrysene	0.450 J mg/kg	0.4 mg/kg
	PESTICIDES/PCBs		
	Dieldrin	0.14 J,EB mg/kg	0.04 mg/kg
	DIOXINS		
	Dioxins [†]	4.7 J ppb	1.0 ppb
	Hexachloroxanthene	263 J ppb	NA
SS-03 (APA74) (DAFZ75) (AAL24-003)	DIOXINS		
	Hexachloroxanthene	9.9 ppb	NA
SS-04 (APA75) (DAFZ76) (AAL24-004)	SVOCs		
	Benzo(a)anthracene	2.4 mg/kg	0.9 mg/kg
	Chrysene	2.2 mg/kg	0.4 mg/kg
	Benzo(b)fluoranthene	3.2 mg/kg	0.9 mg/kg
	Benzo(k)fluoranthene	0.960 mg/kg	0.9 mg/kg
	Benzo(a)pyrene	2.6 mg/kg	0.4 mg/kg
	Indeno(1,2,3-cd)pyrene	1.5 mg/kg	0.9 mg/kg
	Dibenz(a,h)anthracene	0.460 mg/kg	0.4 mg/kg
	Benzo(g,h,i)perylene	1.3 mg/kg	0.8 mg/kg

Table 2

Soil Sample Results from Centredale Manor Site
Above Residential Direct Exposure Criteria (Concluded)

Sample Location	Compound	Sample Concentration	Direct Exposure Criteria* (Residential)
SS-04 (concluded)	DIOXINS		
	Dioxins†	6.3 J ppb	1.0 ppb
	Hexachloroxanthene	168.2 J ppb	NA
SS-05 (APA76) (DAFZ77) (AAL24-005)	SVOCs		
	Chrysene	0.470 J mg/kg	0.4 mg/kg
	Benzo(a)pyrene	0.500 mg/kg	0.4 mg/kg
	DIOXINS		
	Dioxins†	3.4 J ppb	1.0 ppb
	Hexachloroxanthene	63.2 ppb	NA
SS-06 (APA77) (DAFZ78) (AAL24-006)	SVOCs		
	Chrysene	0.710 J mg/kg	0.4 mg/kg
	Benzo(a)pyrene	0.690 J mg/kg	0.4 mg/kg
	DIOXINS		
	Dioxins†	3.0 J ppb	1.0 ppb
	Hexachloroxanthene	48.3 J ppb	NA

J = The associated numerical value is an estimated quantity.

EB = The compound was identified in an aqueous equipment blank (EB) that was used to assess field contamination associated with soil/sediment samples.

R = Value was rejected due to insufficient of non-compliant quality control.

mg/kg = Milligrams per kilogram.

ppb = Parts per billion.

NA = Not Applicable.

PCBs = Polychlorinated Biphenyls.

SVOCs = Semivolatile Organic Compounds.

* For SVOCs, the RI DEM Residential Direct Exposure Criteria (1993, amended 1996) is presented for comparison purposes. For dioxins, the EPA Region I Residential Action Level is presented for comparison purposes. No benchmark concentration is available for hexachloroxanthene.

† Values presented for dioxins are the 2,3,7,8-tetrachlorodibenzo dioxin toxicity equivalence on a dry-weight basis.

[4; 7;10]

2,3,7,8 TCDD PE (method 8280)
Dioxin PE (method 8290)

Complete analytical results of START sediment samples including quantitation and detection limits are presented in Attachment A (for SVOCs and pesticides/PCBs), Attachment B (for dioxin and hexachloroxanthene), and Attachment C (for TOCs). Sample results quantified with a "J" on analytical tables are considered approximate because of limitations identified during CLP and DAS data validation. In addition, organic sample results reported at concentrations below quantitation limits and confirmed by mass spectrometry are also qualified by a "J" and considered approximate.

Table 3 summarizes SVOCs, pesticides/PCBs, dioxins, and HCX detected through analyses of START sediment samples (SD-01 through SD-32) that were collected adjacent to or downstream of the Centredale Manor property. Sediment samples collected upstream of the Centredale Manor property (SD-33 through SD-39) are discussed later in this report.

For each sample location, a compound is listed if it is detected at three times or greater than the appropriate reference sample concentration. Based on its relative upstream location, sediment sample SD-28 is the reference sample for samples SD-01 through SD-27. Based on their relative upstream locations, sediment samples SD-31 and SD-32 (duplicates) are the references for SD-29 and SD-30. If the compound is not detected in the appropriate reference sample, the reference sample quantitation limit (SQL) is used as the reference value. These compounds are listed if they occurred at a value equal to or greater than the reference SQL and are designated by their approximate relative concentration above these values. Dioxin values are presented as the 2,3,7,8-tetrachlorodibenzodioxin (2,3,7,8-TCDD) toxicity equivalence on a dry-weight basis. The estimated detection limit for 2,3,7,8-TCDD is used to calculate the total toxicity equivalence value for the reference sample [11].

Twelve SVOCs, 12 pesticides, one PCB (Aroclor-1254), dioxins, and HCX were detected at concentrations exceeding reference values in various sediment samples collected along Woonasquatucket River downstream of the Centredale Manor property (SD-01 through SD-27). In addition, five pesticides, one PCB (Aroclor-1254), dioxins, and HCX were detected at concentrations exceeding reference values in the drainage channel downstream sediment samples (SD-29 and SD-30) [4; 5].

Generally, dioxin concentrations were highest near the Centredale Manor property and attenuate to less than 1 ppb at downstream locations. The highest concentration of dioxins was detected in a sediment sample collected along the drainage channel (SD-30) adjacent to the Centredale Manor property, which flows into the Woonasquatucket River approximately 0.3 miles downstream of the property. Analytical results of the Woonasquatucket River sediment samples indicate that the highest dioxin concentration detected was 10.8 ppb in sample SD-23 collected at the Allendale Dam Area [7]. It should be noted that this is the first downstream dam from the Centredale Manor property. The dam acts as a barrier and slows the flow of water, providing the sediments and possibly contaminants time to settle out of the water column.

Various SVOCs and pesticides/PCBs were detected at several locations along the Woonasquatucket River and the drainage channel. However, the greatest number of SVOCs and the highest concentrations of SVOCs were detected in the sample collected farthest downstream along Woonasquatucket River (SD-01) [4; 5]. Sediment samples with elevated levels of PCBs were detected only in samples upstream of the Allendale Dam.

Table 3

Summary of Analytical Results
Sediment Sample Analysis for Woonasquatucket River Samples SD-01 through SD-32

Sample Location	Compound/Element	Sample Concentration	Reference Concentration*	Comments
SD-01 (APA78) (DAFZ79) AAL24-007	SVOCs			
	Acenaphthene	170 J ppb	56 J ppb	3.0 × Ref
	Phenanthrene	3,400 ppb	1,100 ppb	3.1 × Ref
	Fluoranthene	9,100 ppb	1,400 ppb	6.5 × Ref
	Pyrene	11,000 J ppb	1,100 ppb	10 × Ref
	Benzo(a)anthracene	4,500 ppb	560 ppb	8.0 × Ref
	Chrysene	2,600 J ppb	580 ppb	4.5 × Ref
	Bis(2-ethylhexyl)phthalate	3,700 J ppb	87 J ppb	42 × Ref
	Benzo(b)fluoranthene	4,700 ppb	830 J ppb	5.7 × Ref
	Benzo(a)pyrene	3,700 ppb	530 ppb	7.0 × Ref
	Indeno(1,2,3-cd)pyrene	3,500 ppb	340 J ppb	10 × Ref
	Dibenz(a,h)anthracene	680 ppb	140 J ppb	4.9 × Ref
	Benzo(g,h,i)perylene	2,700 ppb	280 J ppb	9.6 × Ref
	PESTICIDES/PCBs			
	Heptachlor Epoxide	2.7 J ppb	2.1 U ppb	1.3 × SQL
	4,4'-DDD	35 J ppb	4.1 U ppb	8.5 × SQL
	4,4'-DDT	22 J ppb	4.1 U ppb	5.4 × SQL
	DIOXINS			
	Dioxins [†]	0.12 ppb	0.002 UJ ppb	60 × SQL
	Hexachloroxanthene	49.4 J ppb	0.261 UJ ppb	190 × SQL
SD-02 (APA79) (DAFZ80) AAL24-008	SVOCs			
	Bis(2-ethylhexyl)phthalate	840 ppb	87 J ppb	9.7 × Ref
	PESTICIDES/PCBs			
	4,4'-DDE	3.6 J ppb	0.38 J ppb	9.5 × Ref
	4,4'-DDD	6.1 J ppb	4.1 U ppb	1.5 × SQL
	alpha-Chlordane	3.4 J ppb	2.1 U ppb	1.6 × SQL
	DIOXINS			
	Dioxins [†]	0.088 J ppb	0.002 UJ ppb	44 × SQL
Hexachloroxanthene	21.9 J ppb	0.261 UJ ppb	84 × SQL	

Table 3

Summary of Analytical Results
Sediment Sample Analysis for Woonasquatucket River Samples SD-01 through SD-32
(Continued)

Sample Location	Compound/Element	Sample Concentration	Reference Concentration*	Comments
SD-03 (APA80) (DAFZ81) AAL24-009	SVOCs			
	Acenaphthene	250 J ppb	56 J ppb	4.5 × Ref
	Bis(2-ethylhexyl)phthalate	440 ppb	87 J ppb	5.1 × Ref
	Benzo(b)fluoranthene	2,500 ppb	830 J ppb	3.0 × Ref
	Benzo(a)pyrene	1,600 ppb	530 ppb	3.0 × Ref
	DIOXINS			
Dioxins [†]	0.034 J ppb	0.002 UJ ppb	17 × SQL	
SD-04 (APA81) (DAFZ82) AAL24-010	SVOCs			
	Bis(2-ethylhexyl)phthalate	870 ppb	87 J ppb	10 × Ref
	PESTICIDES/PCBs			
	4,4'-DDE	3.7 J ppb	0.38 J ppb	9.7 × Ref
	4,4'-DDD	5.1 J ppb	4.1 U ppb	1.2 × SQL
	alpha-Chlordane	4.2 J ppb	2.1 U ppb	2.0 × SQL
	DIOXINS			
	Dioxins [†]	0.42 J ppb	0.002 UJ ppb	210 × SQL
Hexachloroxanthene	6.8 J ppb	0.261 UJ ppb	26 × SQL	
SD-05 (APA82) (DAFZ83) AAL24-011	PESTICIDES/PCBs			
	4,4'-DDE	4.9 ppb	0.38 J ppb	13 × Ref
	DIOXINS			
Dioxins [†]	0.018 J ppb	0.002 UJ ppb	9.0 × SQL	
SD-06 (APA83) (DAFZ84) AAL24-012	DIOXINS			
	Dioxins [†]	0.018 J ppb	0.002 UJ ppb	9.0 × SQL
SD-07 (APA84) (DAFZ85) AAL24-013	DIOXINS			
	Dioxins [†]	0.055 J ppb	0.002 UJ ppb	28 × SQL
SD-08 (APA85) (DAFZ86) AAL24-01	SVOCs			
	Bis(2-ethylhexyl)phthalate	390 J ppb	87 J ppb	4.5 × Ref
	DIOXINS			
Dioxins [†]	0.21 J ppb	0.002 UJ ppb	105 × SQL	

Table 3

Summary of Analytical Results
Sediment Sample Analysis for Woonasquatucket River Samples SD-01 through SD-32
(Continued)

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration*	Comments
SD-09 (APA86) (DAFZ87) AAL24-015	DIOXINS			
	Dioxins [†]	0.030 J ppb	0.002 UJ ppb	15 × SQL
SD-10 (APA87) (DAFZ88) AAL24-016	SVOCs			
	Bis(2-ethylhexyl)phthalate	700 ppb	87 J ppb	8.1 × Ref
	PESTICIDES/PCBs			
	4,4'-DDE	1.7 J ppb	0.38 J ppb	4.5 × Ref
	alpha-Chlordane	2.4 J ppb	2.1 U ppb	1.1 × SQL
	DIOXINS			
	Dioxins [†]	0.16 J ppb	0.002 UJ ppb	80 × SQL
SD-11 (APA88) (DAFZ89) AAL24-017	PESTICIDES/PCBs			
	4,4'-DDE	6.1 ppb	0.38 J ppb	16 × Ref
	alpha-Chlordane	14 J ppb	2.1 U ppb	6.7 × SQL
	gamma-Chlordane	16 J ppb	2.1 U ppb	7.6 × SQL
	DIOXINS			
	Dioxins [†]	0.27 J ppb	0.002 UJ ppb	135 × SQL
SD-12 (APA89) (DAFZ90) AAL24-018	DIOXINS			
	Dioxins [†]	0.020 J ppb	0.002 UJ ppb	10 × SQL
SD-13 (APA90) (DAFZ91) AAL24-019	PESTICIDES/PCBs			
	4,4'-DDE	3.5 J ppb	0.38 J ppb	9.2 × Ref
	alpha-Chlordane	5.7 ppb	2.1 U ppb	2.7 × SQL
	gamma-Chlordane	3.5 ppb	2.1 U ppb	1.7 × SQL
	DIOXINS			
	Dioxins [†]	0.12 J ppb	0.002 UJ ppb	60 × SQL
SD-14 (APA91) (DAFZ92) AAL24-020	PESTICIDES/PCBs			
	4,4'-DDE	3.6 J ppb	0.38 J ppb	9.5 × Ref
	4,4'-DDD	4.1 ppb	4.1 U ppb	1.0 × SQL

Table 3

Summary of Analytical Results
Sediment Sample Analysis for Woonasquatucket River Samples SD-01 through SD-32
(Continued)

Sample Location	Compound/Element	Sample Concentration	Reference Concentration*	Comments
SD-14 (concluded)	alpha-Chlordane	25 J ppb	2.1 U ppb	12 × SQL
	gamma-Chlordane	21 ppb	2.1 U ppb	10 × SQL
	DIOXINS			
	Dioxins [†]	0.030 J ppb	0.002 UJ ppb	15 × SQL
SD-16 (APA93) (DAFZ94) AAL24-022	PESTICIDES/PCBs			
	4,4'-DDE	2.5 J ppb	0.38 J ppb	6.6 × Ref
	alpha-Chlordane	3.5 J ppb	2.1 U ppb	1.7 × SQL
	DIOXINS			
	Dioxins [†]	0.47 J ppb	0.002 UJ ppb	240 × SQL
	Hexachloroxanthene	15 J ppb	0.261 UJ ppb	57 × SQL
SD-17 (APA94) (DAFZ95) AAL24-023	PESTICIDES/PCBs			
	4,4'-DDE	6.8 J ppb	0.38 J ppb	18 × Ref
	alpha-Chlordane	12 J ppb	2.1 U ppb	5.7 × SQL
	gamma-Chlordane	7.9 J ppb	2.1 U ppb	3.8 × SQL
	DIOXINS			
	Dioxins [†]	0.62 J ppb	0.002 UJ ppb	310 × SQL
	Hexachloroxanthene	15 J ppb	0.261 UJ ppb	57 × SQL
SD-18 (APA95) (DAFZ96) AAL24-024	SVOCs			
	Bis(2-ethylhexyl)phthalate	470 ppb	87 J ppb	5.4 × Ref
	PESTICIDES/PCBs			
	4,4'-DDE	2.8 J ppb	0.38 J ppb	7.4 × Ref
	alpha-Chlordane	5.6 J ppb	2.1 U ppb	2.7 × SQL
	gamma-Chlordane	4.7 J ppb	2.1 U ppb	2.2 × SQL
	DIOXINS			
	Dioxins [†]	8.0 J ppb	0.002 UJ ppb	4,000 × SQL
	Hexachloroxanthene	167 J ppb	0.261 UJ ppb	640 × SQL

Table 3

Summary of Analytical Results
Sediment Sample Analysis for Woonasquatucket River Samples SD-01 through SD-32
(Continued)

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration*	Comments
SD-19 (APA96) (DAFZ97) AAL24-025	SVOCs			
	Bis(2-ethylhexyl)phthalate	920 ppb	87 J ppb	10 × Ref
	PESTICIDES/PCBs			
	4,4'-DDE	1.3 J ppb	0.38 J ppb	3.4 × Ref
	alpha-Chlordane	9.1 ppb	2.1 U ppb	4.3 × SQL
	gamma-Chlordane	4.0 J ppb	2.1 U ppb	1.9 × SQL
	DIOXINS			
Dioxins [†]	0.018 J ppb	0.002 UJ ppb	9.0 × SQL	
SD-20 (APA97) (DAFZ98) AAL24-026	SVOCs			
	Bis(2-ethylhexyl)phthalate	590 J ppb	87 J ppb	6.8 × Ref
	Indeno(1,2,3-cd)pyrene	1,200 J ppb	340 J ppb	3.5 × Ref
	PESTICIDES/PCBs			
	delta-BHC	2.4 J ppb	2.1 U ppb	1.1 × SQL
	4,4'-DDE	4.2 J ppb	0.38 J ppb	11 × Ref
	Endrin Aldehyde	5.2 J ppb	0.77 J ppb	6.8 × Ref
	Aroclor-1254	200 J ppb	48 J ppb	4.2 × Ref
	DIOXINS			
Dioxins [†]	3.6 J ppb	0.002 UJ ppb	1,800 × SQL	
Hexachloroxanthene	76 J ppb	0.261 UJ ppb	290 × SQL	
SD-21 (APA98) (DAFZ99) AAL24-027	SVOCs			
	Bis(2-ethylhexyl)phthalate	330 J ppb	87 J ppb	3.8 × Ref
	PESTICIDES/PCBs			
	4,4'-DDE	2.8 J ppb	0.38 J ppb	7.4 × Ref
Endrin aldehyde	2.6 J ppb	0.77 J ppb	3.4 × Ref	

Table 3

Summary of Analytical Results
Sediment Sample Analysis for Woonasquatucket River Samples SD-01 through SD-32
 (Continued)

Sample Location	Compound/ Element	Sample Concentration	Reference Concentration*	Comments
SD-21 (concluded)	DIOXINS			
	Dioxins [†]	4.1 J ppb	0.002 UJ ppb	2,050 × SQL
	Hexachloroxanthene	99 J ppb	0.261 UJ ppb	380 × SQL
SD-22 (APA99) (DAF01A) AAL24-028	SVOCs			
	Bis(2-ethylhexyl)phthalate	930 J ppb	87 J ppb	11 × Ref
	Indeno(1,2,3-cd)pyrene	1,800 ppb	340 J ppb	5.3 × Ref
	Dibenz(a,h)anthracene	440 J ppb	140 J ppb	3.1 × Ref
	Benzo(g,h,i)perylene	1,100 ppb	280 J ppb	3.9 × Ref
	PESTICIDES/PCBs			
	4,4'-DDE	9.5 J ppb	0.38 J ppb	25 × Ref
	Methoxychlor	16 J ppb	3.5 J ppb	4.6 × Ref
	alpha-Chlordane	9.1 ppb	2.1 U ppb	4.3 × SQL
	gamma-Chlordane	9.3 J ppb	2.1 U ppb	4.4 × SQL
	Aroclor-1254	440 ppb	48 J ppb	9.2 × Ref
	DIOXINS			
	Dioxins [†]	7.5 J ppb	0.002 J ppb	3,750 × SQL
	Hexachloroxanthene	163 J ppb	0.261 UJ ppb	624 × SQL
	SD-23 (APB00) (DAF02A) AAL24-029	SVOCs		
Bis(2-ethylhexyl)phthalate		1,600 J ppb	87 J ppb	18 × Ref
Indeno(1,2,3-cd)pyrene		1,100 J ppb	340 J ppb	3.2 × Ref
Benzo(g,h,i)perylene		990 J ppb	280 J ppb	3.5 × Ref
PESTICIDES/PCBs				
4,4'-DDE		9.3 J ppb	0.38 J ppb	24 × Ref
gamma-Chlordane		5.0 J ppb	2.1 U ppb	2.4 × SQL
Aroclor-1254		320 J ppb	48 J ppb	6.7 × Ref

Table 3

Summary of Analytical Results
Sediment Sample Analysis for Woonasquatucket River Samples SD-01 through SD-32
(Continued)

Sample Location	Compound/Element	Sample Concentration	Reference Concentration*	Comments
SD-23 (concluded)	DIOXINS			
	Dioxins [†]	10.1 J ppb	0.002 UJ ppb	5,050 × SQL
	Hexachloroxanthene	365 J ppb	0.261 UJ ppb	1,400 × SQL
SD-24 (APB01) (DAF03A) AAL24-030	SVOCs			
	Bis(2-ethylhexyl)phthalate	650 J ppb	87 J ppb	7.5 × Ref
	Indeno(1,2,3-cd)pyrene	1,200 J ppb	340 J ppb	3.5 × Ref
	PESTICIDES/PCBs			
	4,4'-DDE	5.1 J ppb	0.38 J ppb	13 × Ref
	Methoxychlor	12 J ppb	3.5 J ppb	3.4 × Ref
	gamma-Chlordane	3.2 J ppb	2.1 U ppb	1.5 × SQL
	Aroclor-1254	260 J ppb	48 J ppb	5.4 × Ref
	DIOXINS			
	Dioxins [†]	5.8 J ppb	0.002 UJ ppb	2,900 × SQL
	Hexachloroxanthene	135 J ppb	0.261 UJ ppb	517 × SQL
SD-25 (APB02) (DAF04A) AAL24-031	SVOCs			
	Bis(2-ethylhexyl)phthalate	510 J ppb	87 J ppb	5.9 × Ref
	PESTICIDES/PCBs			
	4,4'-DDE	3.7 J ppb	0.38 J ppb	9.7 × Ref
	gamma-Chlordane	2.4 J ppb	2.1 U ppb	1.1 × SQL
	Aroclor-1254	170 J ppb	48 J ppb	3.5 × Ref
	DIOXINS			
	Dioxins [†]	5.2 J ppb	0.002 UJ ppb	2,600 × SQL
Hexachloroxanthene	89 J ppb	0.261 UJ ppb	340 × SQL	

Table 3

Summary of Analytical Results
Sediment Sample Analysis for Woonasquatucket River Samples SD-01 through SD-32
(Continued)

Sample Location	Compound/Element	Sample Concentration	Reference Concentration*	Comments
SD-26 (APB03) (DAF05A) AAL24-032	DIOXINS			
	Dioxins [†]	0.093 ppb	0.002 UJ ppb	47 × SQL
SD-27 (APB04) (DAF06A) AAL24-033	PESTICIDES/PCBs			
	Dieldrin	12 ppb	4.1 U ppb	2.9 × SQL
	4,4'-DDE	5.2 ppb	0.38 J ppb	14 × Ref
	Endrin aldehyde	2.6 J ppb	0.77 J ppb	3.4 × Ref
	DIOXINS			
	Dioxins [†]	1.3 J ppb	0.002 UJ ppb	650 × SQL
	Hexachloroxanthene	50 J ppb	0.261 UJ ppb	190 × SQL
SD-29 (APB06) (DAF08A) AAL24-035	PESTICIDES/PCBs			
	gamma-Chlordane	5.5 J ppb	1.4 J ppb	3.9 × Ref
	Aroclor-1254	65 J ppb	41 U ppb	1.6 × SQL
	DIOXINS			
	Dioxins [†]	0.057 J ppb	0.002 UJ ppb	28 × SQL
SD-30 (APB07) (DAF09A) AAL24-036	PESTICIDES/PCBs			
	beta-BHC	6.5 J ppb	1.7 U ppb	3.8 × CRQL
	Dieldrin	27 J,EB ppb	4.1 U ppb	6.6 × SQL
	4,4'-DDE	23 J ppb	4.1 U ppb	5.6 × SQL
	Endosulfan Sulfate	23 ppb	3.3 U ppb	7.0 × CRQL
	Aroclor-1254	1,400 ppb	41 U ppb	34 × Ref

Table 3

Summary of Analytical Results
Sediment Sample Analysis for Woonasquatucket River Samples SD-01 through SD-32
(Concluded)

Sample Location	Compound/Element	Sample Concentration	Reference Concentration*	Comments
SD-30 (concluded)	DIOXINS			
	Dioxins [†]	15.8 J ppb	0.002 UJ ppb	7,900 × SQL
	Hexachloroxanthene	94 J ppb	1.9 UJ ppb	49 × SQL

J = The associated numerical value is an estimated quantity.

U = The compound was analyzed for, but not detected. The associated numerical value is the sample quantitation limit or the adjusted sample quantitation limit.

UJ = The compound was analyzed for, but not detected. The associated numerical value is the estimated sample quantitation limit.

EB = The compound was identified in an aqueous equipment blank (EB) that was used to assess field contamination associated with soil/sediment samples.

mg/kg = Milligrams per kilogram.

ppb = Parts per billion.

PCBs = Polychlorinated Biphenyls.

SVOCs = Semivolatile Organic Compounds.

Ref = Reference value.

SQL = Sample Quantitation Limit.

CRQL = Contract Required Quantitation Limit

* For SVOCs, the reference concentration or the reference SQL is presented. For dioxins, the estimated detection limit for 2,3,7,8-TCDD that is used to calculate the total toxicity equivalence value for the reference sample is presented.

† Values presented for dioxins are the 2,3,7,8-tetrachlorodibenzo dioxin toxicity equivalence on a dry-weight basis.

Note: Analytical results for numerous pesticides and PCBs in sediment samples were rejected due to deficiencies in quality control identified during the data validation process. Refer to Attachment B for complete analytical results.

[4; 5; 7]

Table 4 summarizes SVOCs, pesticides/PCBs, dioxins, and HCX detected through analyses of START sediment samples (SD-33 through SD-39) collected upstream of the Centredale Manor property. For each sample location, a compound is listed if it is detected at three times or greater than the reference sample concentration (SD-39). If the compound is not detected in the reference sample, the reference SQL is used as the reference value. These compounds are listed if they occurred at a value equal to or greater than the reference SQL and are designated by their approximate relative concentration above these values. Dioxin values are presented as the 2,3,7,8-TCDD toxicity equivalence on a dry-weight basis. The estimated detection limit for 2,3,7,8-TCDD is used to calculate the total toxicity equivalence value for the reference sample [11].

A total of 18 SVOCs, two pesticides, one PCB, and dioxins were detected at concentrations exceeding reference values in sediment samples collected along the Woonasquatucket River upstream of the Centredale Manor property. Seventeen of the SVOCs were detected at the highest concentrations in sample SD-37 (collected approximately 1.8 miles upstream of the Centredale Manor property), and 16 of the 18 SVOCs were detected at elevated levels only at sample SD-37. Elevated PCB levels were detected in one sample upstream of the Centredale Manor property (SD-33). Dioxin concentrations detected upstream of the Centredale Manor property ranged from 0.003 J ppb to 0.09 J ppb, significantly lower than the dioxin concentrations detected adjacent to and downstream of the Centredale Manor property.

Table 4

Summary of Analytical Results
Sediment Sample Analysis for Woonasquatucket River Samples SD-33 to SD-39

Sample Location	Compound/Element	Sample Concentration	Reference Concentration*	Comments
SD-33 (APB10) (DAF12A) AAL24-039	SVOCs			
	Benzo(k)fluoranthene	1,000 J ppb	150 J ppb	6.7 × Ref
	PESTICIDES/PCBs			
	Aroclor-1254	7,800 J ppb	57 U ppb	140 × SQL
	DIOXINS			
	Dioxins [†]	0.094 J ppb	0.002 UJ ppb	47 × SQL
SD-34 (APB11) (DAF13A) AAL24-040	SVOCs			
	Benzo(k)fluoranthene	600 J ppb	150 J ppb	4.0 × Ref
	DIOXINS			
	Dioxins [†]	0.020 J ppb	0.002 UJ ppb	10 × SQL
SD-35 (APB12) (DAF14A) AAL24-041	SVOCs			
	Bis(2-ethylhexyl)phthalate	3,300 J ppb	160 J ppb	21 × Ref
	DIOXINS			
	Dioxins [†]	0.003 J ppb	0.002 UJ ppb	1.5 × SQL
SD-37 (APB17) (DAF16A) AAL24-043	SVOCs			
	Naphthalene	930 ppb	570 U ppb	1.6 × SQL
	Acenaphthene	1,600 ppb	570 U ppb	2.8 × SQL
	Dibenzofuran	1,300 ppb	570 U ppb	2.3 × SQL
	Fluorene	2,000 ppb	570 U ppb	3.5 × SQL
	Phenanthrene	17,000 ppb	280 J ppb	61 × Ref
	Anthracene	3,100 ppb	96 J ppb	32 × Ref

Table 4

Summary of Analytical Results
Sediment Sample Analysis for Woonasquatucket River Samples SD-33 to SD-39
(Concluded)

Sample Location	Compound/Element	Sample Concentration	Reference Concentration*	Comments	
SD-37 (concluded)	Carbazole	2,000 J ppb	570 UJ ppb	3.5 × SQL	
	Fluoranthene	17,000 ppb	670 ppb	25 × Ref	
	Pyrene	17,000 ppb	560 J ppb	30 × Ref	
	Benzo(a)anthracene	8,600 ppb	340 J ppb	25 × Ref	
	Chrysene	7,900 ppb	370 J ppb	21 × Ref	
	Benzo(b)fluoranthene	8,400 ppb	450 J ppb	19 × Ref	
	Benzo(k)fluoranthene	2,400 ppb	150 J ppb	16 × Ref	
	Benzo(a)pyrene	6,200 ppb	430 J ppb	14 × Ref	
	Indeno(1,2,3-cd)pyrene	2,700 ppb	200 J ppb	13 × Ref	
	Dibenz(a,h)anthracene	880 ppb	69 J ppb	13 × Ref	
	Benzo(g,h,i)perylene	2,600 ppb	250 J ppb	10 × Ref	
	PESTICIDES/PCBs				
		4,4'-DDT	11 J ppb	5.7 U ppb	1.9 × SQL
	Endrin Ketone	20 J ppb	5.7 U ppb	3.5 × SQL	

- J = The associated numerical value is an estimated quantity.
U = The compound was analyzed for, but not detected. The associated numerical value is the sample quantitation limit or the adjusted sample quantitation limit.
UJ = The compound was analyzed for, but not detected. The associated numerical value is the estimated sample quantitation limit.
ppb = Parts per billion.
PCBs = Polychlorinated Biphenyls.
SVOCs = Semivolatile Organic Compounds.
Ref = Reference value.
SQL = Sample Quantitation Limit.

* For SVOCs, the reference concentration or the reference SQL is presented. For dioxins, the estimated detection limit for 2,3,7,8-TCDD that is used to calculate the total toxicity equivalence value for the reference sample is presented.

† Values presented for dioxins are the 2,3,7,8-tetrachlorodibenzo dioxin toxicity equivalence on a dry-weight basis.

Note: Analytical results for numerous pesticides and PCBs in sediment samples were rejected. Refer to Attachment B for complete analytical results.

[5; 6; 7]

On 15 January 1999, START personnel, along with personnel from the EPA OEME, collected a total of three drinking water samples from the Pied Piper Nursery School and from the Yacht Club Bottling Works, Inc. Additionally, 17 soil samples were collected on the Centredale Manor and Brook Village properties, the Lee Romano Little League Field, and the Boys and Girls Club property [3; Figures 3A and 3B].

A total of 20 samples were submitted to the EPA Region VII laboratory to be analyzed for dioxins and HCX. Three of the 17 soil samples collected had dioxin levels exceeding the EPA Region I Residential Action Level for dioxin (1 ppb). All of the elevated levels were noted in samples collected from the Centredale Manor property [Figure 3A]. The exceedences ranged from 2.5 ppb to 5.5 ppb, with the highest concentration detected in soil sample SS-99-03 (5.5 ppb) [12]. Table 5 summarizes dioxins exceeding the EPA Region I Residential Action Level of 1 ppb.

On 27 January 1999, EPA ERT and WESTON REAC personnel collected a total of five soil samples from the Lee Romano Little League Field property which were analyzed for dioxins. Analytical levels indicate that there were no dioxin levels exceeding the EPA Region I Residential Action Level for dioxin (1 ppb) [12; Figure 3B].

START personnel, along with EPA Region I, EPA OEME, EPA Emergency Response Team (ERT), and WESTON Response Engineering and Analytical Contract (REAC) personnel, conducted soil sampling (Phase I) on and around the Centredale Manor and Brook Village properties on 16 through 18 February 1999. A geophysical survey was also conducted on the Centredale Manor and Brook Village properties to assist in determining if there were any buried objects (i.e., drums, tanks) which may be contributing to the on-site contamination [3]. Soil samples were submitted to a private laboratory to be analyzed for dioxins. The findings of this survey and validated data are not yet available.

Table 5

**Soil Sample Results from 15 January 1999
Above Residential Direct Exposure Criteria**

Sample Location	Compound	Sample Concentration	Direct Exposure Criteria* (Residential)
SS-99-03 (DAF33J)	DIOXINS		
	Dioxins [†]	5.5 ppb	1.0 ppb
SS-99-04 (DAF34J)	DIOXINS		
	Dioxins [†]	2.5 ppb	1.0 ppb
SS-99-05 (DAF35J) (Dup. of SS-99-04)	DIOXINS		
	Dioxins [†]	2.5 ppb	1.0 ppb

ppb = Parts per billion.

* For dioxins, the EPA Region I Residential Action Level is presented for comparison purposes.

[†] Values presented for dioxins are the 2,3,7,8-tetrachlorodibenzo dioxin toxicity equivalence on a dry-weight basis.

[12]

SUMMARY

The Centredale Manor Site, for the purpose of this Expanded Site Inspection (ESI), consists of the Centredale Manor property as well as portions of the Brook Village property and the Woonasquatucket River (upstream of, adjacent to, and downstream of the Centredale Manor property). The Centredale Manor property is located at 2074 Smith Street in North Providence, Rhode Island. The 4.74-acre property is bordered by apartments to the north, a drainage channel to the east, a wooded area to the south, and the Woonasquatucket River to the west. An eight-story apartment building housing 135 residents is currently located on the property.

A chemical manufacturing facility and a drum recycling facility reportedly operated at the property between 1943 and 1971. Prior to this time, the property was occupied by a textile mill; additional information regarding the types of textiles produced was not available. In the mid-1970s, the existing buildings at the property were demolished.

From 1977 to 1996, numerous investigations of the Centredale Manor property and/or the Woonasquatucket River were completed by various organizations. Specifically, in 1977, representatives of the State of Rhode Island responded to complaints of fumes at the property which resulted in the discovery of approximately 60 drums. In the early 1980s, an additional 400 drums were identified either on the property or along the Woonasquatucket River. The drums reportedly contained caustics, solvents, polychlorinated biphenyls (PCBs), and ink wastes. Subsequently, a Notice of Violation was issued to the property owners for violations of the State Hazardous Waste Management Act.

In 1986, an EPA Preliminary Assessment (PA) was completed, and in 1990 an EPA Screening Site Inspection (SSI) of the Centredale Manor property was completed. As part of the SSI, samples were collected which indicated the presence of six volatile organic compounds (VOCs), 29 semivolatile organic compounds (SVOCs), four pesticides, two PCB congeners, and six inorganic elements. In 1996, as part of an EPA Site Inspection Prioritization (SIP), sediment samples were collected from along the Woonasquatucket River and from wetlands along the drainage channel. Analytical results of the samples indicated the presence of two VOCs, thirteen SVOCs, and ten inorganic elements. None of these samples were analyzed for dioxin.

In June 1996, fish tissue samples were collected and analyzed for inorganic elements, PCBs and dioxin. Based on elevated dioxin levels detected in fish tissue samples, a fish consumption advisory was issued. In January 1997, EPA representatives collected water and sediment samples at seven dam locations along the river. The results indicated elevated concentrations of numerous SVOCs, chlorinated pesticides, PCBs, inorganic elements, and dioxin.

In September 1998, as part of this ESI, soil and sediment samples were collected from the Centredale Manor Site. Analytical results (of both sediment and soil samples) revealed numerous SVOCs as well as dioxin at concentrations exceeding reference values. Subsequently, in January 1999, additional samples were collected from the Centredale Manor and Brook Village properties, as well as the Lee Romano Little League Field and the Boys and Girls Club to better determine the extent of dioxin contamination. The investigations of the Centredale Manor Site by EPA is continuing at this present time.

**SITE INVESTIGATION REPORT
CUMBERLAND FARMS INC. FACILITY # 3843
2064 SMITH STREET
NORTH PROVIDENCE, RHODE ISLAND**

March 8, 2001

Prepared for:

Cumberland Farms Inc.
777 Dedham Street
Canton, Massachusetts

Prepared by:

Lincoln Environmental, Inc.
333 Washington Highway
Smithfield, Rhode Island 02917

Lincoln Project Number RCF8338B

F:\APPS\WORD\FIRM\CF\RCF8338B\SITE INV REPORT.DOC

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
3.0	SITE AND SURROUNDING AREA DESCRIPTION AND USAGE.....	1
3.1	SITE HISTORY, DESCRIPTION, AND USAGE.....	1
3.2	SURROUNDING AREA DESCRIPTION USAGE.....	2
3.3	AREA GROUNDWATER CLASSIFICATION.....	2
4.0	SITE INVESTIGATION ACTIVITIES.....	3
4.1	MONITOR WELL INSTALLATION.....	3
4.2	SOIL SCREENING.....	3
4.2.1	<i>Geology</i>	3
4.2.2	<i>Soil Analytical Results</i>	4
4.3	GROUNDWATER GAUGING.....	4
4.3.1	<i>Hydrogeology</i>	4
4.3.2	<i>Groundwater Analytical Results</i>	4
5.0	SUMMARY.....	5
6.0	CONCLUSIONS AND RECOMMENDATIONS.....	5
7.0	LIMITATIONS.....	5
8.0	CERTIFICATION.....	7

FIGURES

Figure 1	Site Location Map
Figure 2	Site Plan
Figure 3	Abutters Map
Figure 4	Groundwater Contour Map

TABLES

Table 1	Summary of Soil Analytical Data
Table 2	Summary of Groundwater Analytical Data

APPENDICES

Appendix 1	Well Boring Logs
Appendix 2	Laboratory Analytical Data and Chain of Custody-Soil
Appendix 3	Groundwater Gauging Data
Appendix 4	Laboratory Analytical Data and Chain of Custody-Groundwater

1.0 INTRODUCTION

Lincoln Environmental, Inc. (Lincoln) was retained by Cumberland Farms Inc. (CFI) to perform a site investigation at their facility No.3843, located at 2064 Smith Street (Route 44) North Providence, Rhode Island (site). A Site Location Map is included as **Figure 1**. The site investigation was required by the Rhode Island Department of Environmental Management (RIDEM) in a correspondence dated December 4, 2000, based upon elevated concentrations of petroleum hydrocarbons that were detected in a site monitor well's groundwater sample.

2.0 BACKGROUND

During petroleum piping upgrade activities in August 1998, impacted soil was noted and was attributed to routine operation and maintenance of the UST system and appurtenances. Excavation activities were performed in August 1998 in an attempt to achieve a reduction in volatile organic compounds (VOCs) to less than 20 parts per million (ppm). In this effort, approximately 74 tons of soil was transported off site for recycling via asphalt batching. A Release Characterization Report was submitted to the RIDEM in December 1998.

In a correspondence dated November 4, 1999 the RIDEM concurred with Lincoln to install a monitor well in the area of impact. A Monitor Well Installation/Sampling Letter Report was submitted to the RIDEM in January 2000. The monitor well tested positive for BTEX and MTBE compounds above the RIDEM GB groundwater standards, therefore requiring the RIDEM to request a site investigation.

3.0 SITE AND SURROUNDING AREA DESCRIPTION AND USAGE

3.1 Site History, Description, and Usage

The site is located at 2064 Smith Street (Route 44) identified on the North Providence Tax Assessor's Office as Plat 14, Lot 251 in North Providence, Rhode Island. The site has operated

as a gasoline filling station since at least 1983 under the ownership of VHS Realty Inc., which acquired the property in 1981. Site usage prior to 1981 is described as belonging to Herbert H. Sweet and Milton B. Sweet Estate, Inc. from 1971. Prior to 1971 and dating back to 1936, the Olneyville Wool Combing Company owned the property. Records at the Town of North Providence Tax Assessors Office were reviewed to develop an ownership chronology of the site.

The property is comprised of a one-story concrete block convenience store and a pizza restaurant with two gasoline pumps with canopy in the frontal portion of the property and the USTs abutting the pump island. The gas station area is paved with either asphalt or concrete. A Site Plan depicting these major site features is included as **Figure 2**.

3.2 Surrounding Area Description Usage

The site is surrounded primarily by commercial property. A small parcel of land owned by Joseph E. Buonanno abuts the site to the northwest. An apartment complex abuts this property which is adjacent to the Woonasquatucket River. To the rear of the property in the southwest is an unnamed brook, possibly a storm drain discharge. To the south/southeast is an empty lot. It was observed that the Town of North Providence uses the empty lot to the rear as a bus turnaround. Prior usage of this vacant land is not known. To the north/northeast across Smith Street are various retail establishments. **Figure 3** depicts abutting site properties.

3.3 Area Groundwater Classification

According to the Rhode Island Department of Health, there are no private drinking water wells within one half mile of the site. Additionally, there was no record of public drinking water wells within one-quarter mile of the site. According to RIDEM groundwater classification maps, groundwater on the site and abutting properties is classified as GB. A GB classification denotes areas where the RIDEM considers the groundwater not suitable for public or private drinking without the use of treatment. The site and surrounding area is serviced by municipal water supply.

4.0 SITE INVESTIGATION ACTIVITIES

4.1 Monitor Well Installation

On January 9, 2001, Technical Drilling Services of Sterling, Massachusetts, under the direction Lincoln performed drilling activities at the site. A Site Plan depicting the locations of the new and existing monitor wells is included as **Figure 2**.

All wells (MW-2, MW-3 and MW-4) were installed using 4.25" hollow stem augers. Each monitor well was constructed of two-inch, nine-foot screened sections of PVC pipe, set approximately seven feet into the water table and flush threaded to solid PVC riser and brought to grade. The screened portion of the well was backfilled with #2 silica sand and capped with a subsurface bentonite annular seal. The wells were finished with a flush mounted, watertight road box secured in concrete, to prevent surface run-off infiltration. Monitor well construction logs are included as **Appendix 1**.

4.2 Soil Screening

Field screening of the soil was performed at five-foot intervals, utilizing a 10.6 eV photoionization detector calibrated to an isobutylene standard. All wells recorded results below the instrument's detection limit of 1 ppm for VOCs. Samples were collected and preserved from all wells at approximately the water table interface and retained for laboratory analysis. The samples were submitted to Toxikon for analysis of BTEX and MTBE via EPA Method 8260.

4.2.1 Geology

General subsurface stratigraphy, as revealed by field observation, includes pebbles, fine to medium light brown sands and silts. The Wentworth scale was used to classify soils.

4.2.2 Soil Analytical Results

During installation of MW-1 in 1999 soil analytical results detected benzene at a concentration above the RIDEM GB soil criteria. Soil analytical results revealed that all target compounds were below detectable levels for the newly installed wells. Soil results are summarized in **Table 1**. Analytical results are presented in full in **Appendix 2**.

4.3 Groundwater Gauging

On January 25, 2001 the newly installed monitor wells were surveyed to establish locations and top of casing elevations. Also on January 25, 2001 all site monitor wells, including two wells installed by the USEPA and designated as EPA MW-5 and EPA MW-6, were sampled for volatile organic compounds (VOCs) via EPA method 8260. Prior to sampling, the wells were gauged with an ORS interface probe to determine depth to groundwater and the presence of non-aqueous phase liquid (NAPL). No separate phase liquid was detected in any monitor well. Gauging data is included as **Appendix 3**.

4.3.1 Hydrogeology

A Groundwater Contour Elevation Map (included as **Figure 4**) generated from the January 25, 2001 gauging data, reveals groundwater moving across the site in a southerly direction at an average gradient of .001 feet per foot. Average depth to the water table is approximately 12 to 13 feet below grade.

4.3.2 Groundwater Analytical Results

Groundwater analytical results revealed that MW-1 had concentrations of toluene at 29,000 micrograms per liter ($\mu\text{g/l}$), xylenes at 18,500 $\mu\text{g/l}$ and MTBE at 7,600. All other wells were significantly below the RIDEM GB groundwater standard. Groundwater analytical results are presented in **Table 2**. Laboratory analytical results are submitted as **Appendix 4**.

5.0 SUMMARY

- The site is located in a primarily commercial area. The groundwater beneath the site and immediately surrounding area is classified as "GB".
- On January 9, 2001, three groundwater monitor wells were completed at the site.
- Soil beneath the site is primarily comprised of medium to fine sands with some small pebbles and silt to the water table. Bedrock was not encountered.
- The depth to water beneath the site is approximately 12-13 feet below grade.
- Groundwater flow direction beneath the site is southwesterly with an average gradient of approximately 0.001 feet per foot.
- Groundwater laboratory analytical results indicate all wells compliant with the RIDEM GB groundwater objectives for all target compounds with the exception of MW-1.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of assessment activities performed at the site to date, Lincoln concludes that compounds commonly found in petroleum hydrocarbons have impacted soil and groundwater on the site at concentrations that exceed the RIDEM standards. This impact can be inferred as limited to the immediate area surrounding MW-1 only. Lincoln recommends high vacuum extraction of impacted groundwater of MW-1, monthly for three consecutive months after which all site wells will be resampled and submitted for analysis via EPA method 8260 & MTBE. Pending analyses, Lincoln will make further recommendations.

7.0 LIMITATIONS

Information obtained from public agencies, site inspection, limited sampling, and laboratory chemical analysis was used to characterize the site. The accuracy of the conclusions derived from this information is based solely on the accuracy of the information reported. Events occurring on the site after January 25, 2001 are beyond the scope of this report. If information becomes available concerning the site which is not included in this report, it should be made

available to Lincoln so that conclusions and/or recommendations can be reexamined and modified where applicable.

No attempt was made to determine the compliance of present or former owners or operators of the site with federal, state, or municipal environmental or land use laws or regulations.

Due to the fact that geological and soil formations are inherently random, variable and indeterminate (heterogeneous) in nature, the professional services and opinions provided by Lincoln under this agreement are not guaranteed to be a representation of complete site conditions, which are subject to change with time as a result of natural or man-made processes. Although the services are extensive, findings and conclusions are limited to and by the information obtained. Lincoln makes no expressed or implied representation or warranties regarding any changes in condition of the premises after the date of the on-site activities.

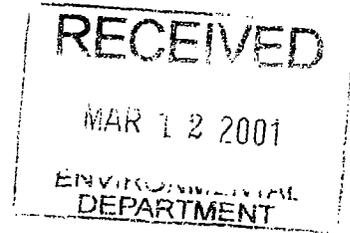
PID field screening is not as sensitive as laboratory analysis and conclusions drawn from such screening are limited to those contaminants potentially detectable with an OVM equipped with a 10.0 eV lamp. No representation regarding the potential results of additional field screening, laboratory testing, or regarding the potential results or tests for materials not tested for is expressed or implied. Any qualitative or quantitative information regarding the site which was not available to Lincoln at the time of this assessment may result in a modification of the representations made in this report.

Subsurface investigation methods are available which could further characterize site soil and groundwater conditions with respect to oil and/or hazardous materials.

Lincoln has retained a copy of this report. No additional or deletions are permitted without the written consent of Lincoln. Use of this report in whole or in part by parties other than those authorized by Lincoln is prohibited.

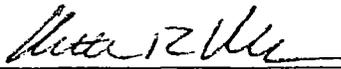
MAR 13 2001

8.0 CERTIFICATION



**Statement of Certification By The
Site Investigation Report Preparer
Lincoln Environmental Inc.
333 Washington Highway
Smithfield, Rhode Island**

I hereby certify and attest that the information provided is true and accurate to the best of our knowledge.

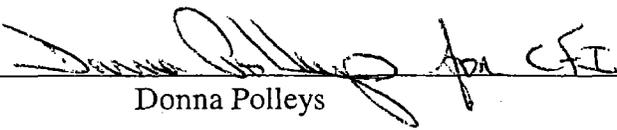
Signature: 
Kenneth R. Mason, PE, Vice President

Business Name: Lincoln Environmental, Inc.
Business Address: 333 Washington Highway
Smithfield, Rhode Island 02917

Phone Number: 401-232-3353 Ext. 114

**Statement of Certification by the Performing Party
Cumberland Farms Inc.
777 Dedham Street
Canton, Massachusetts 02021**

I hereby certify and attest that the information provided is a complete and accurate representation of the site and the release and contains all known facts surrounding the release to the best of their knowledge.

Signature: 
Donna Polleys

Business Name: Cumberland Farms Inc.
Business Address: 777 Dedham Street
Canton, Massachusetts 02021

Phone Number: 1-800-225-9702 Ext. 3414

Table 1							
Soil Analytical Results							
CFI Facility Number 3843							
2064 Smith Street							
North Providence, Rhode Island							
Sample ID	Date	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	Xylenes (µg/kg)	MTBE (µg/kg)	Naphthalene (µg/kg)
MW-1	12/15/1999	37,000	<750	31,000	<1500	<750	22,000
MW-2	01/09/2001	<250	<250	<250	<250	<250	<250
MW-3	01/09/2001	<250	<250	<250	<250	<250	<250
MW-4	01/09/2001	<250	<250	<250	<250	<250	<250
GB Soil Leachability Criteria		4,300	54,000	62,000	NE	100,000	NE

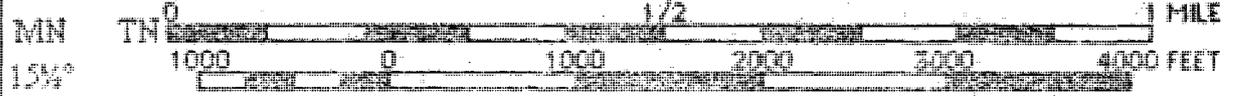
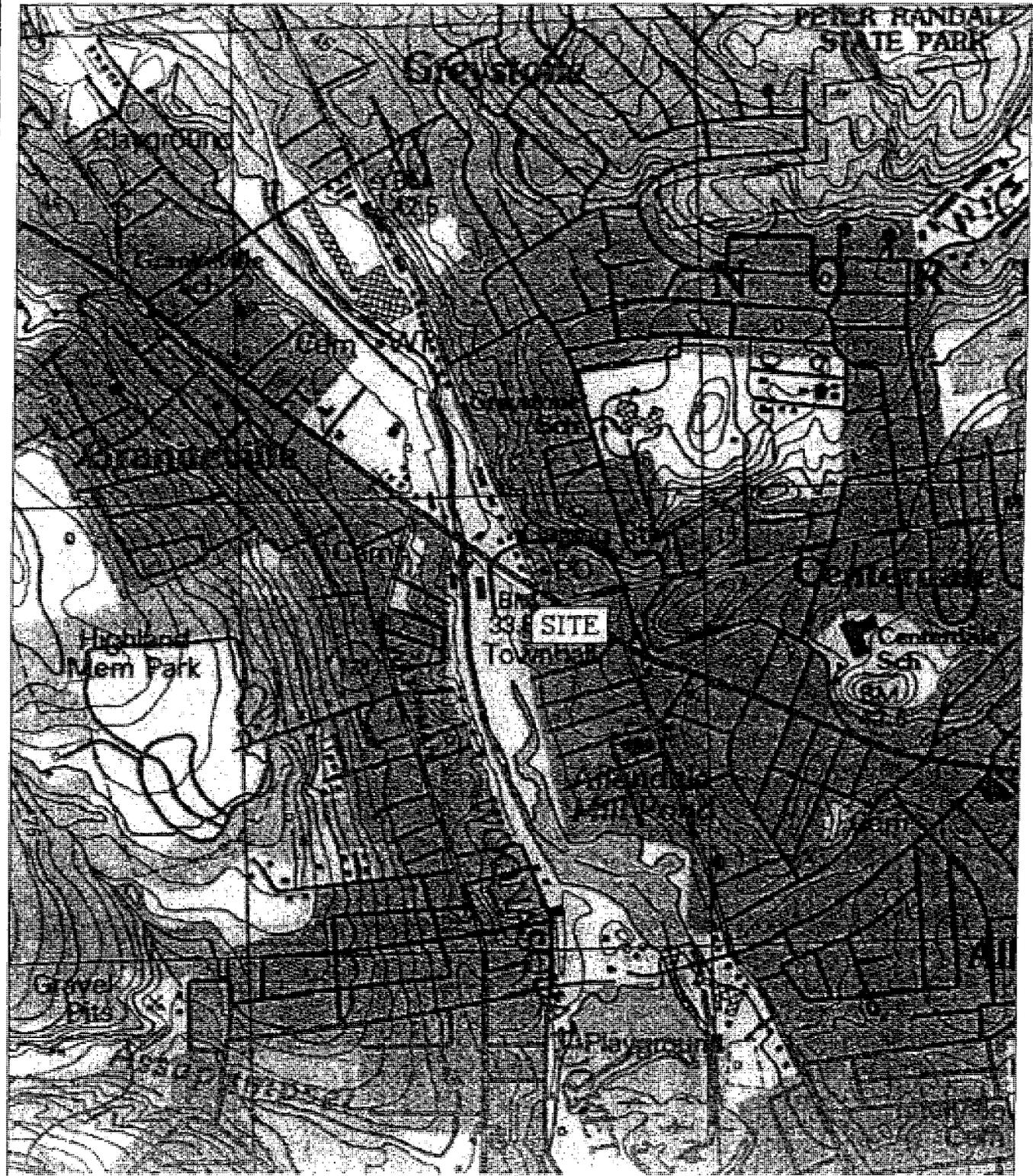
Notes:

- 1) µg/kg = micrograms per kilogram, NE = not established
- 2) All samples analyzed via EPA Method 8260 plus MTBE
- 3) This table summarizes BTEX, MTBE, and Naphthalene compounds only, refer to laboratory report for complete analytical data and method detection limits
- 4) The Soil Leachability Criteria are taken from the RIDEM Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases.
- 5) Values in **BOLD** meet or exceed GB Groundwater Quality Standards from Rules and Regulations for Groundwater Quality

Table 2 Groundwater Analytical Results CFI Facility Number 3843 2064 Smith Street North Providence, Rhode Island						
Sample ID	Date	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	Xylenes (µg/l)	MTBE (µg/l)
MW-1	12/20/1999	2,900	<1,000	3,100	19,200	<1,000
	01/25/2001	<5,000	29,000	<5,000	18,500	7,600
MW-2	01/25/2001	<5	<5	<5	<5	<5
MW-3	01/25/2001	<5	<5	<5	<5	<5
MW-4	01/25/2001	<5	<5	<5	<5	<5
EPA MW-5	01/25/2001	<5	<5	<5	<5	<5
EPA MW-6	01/25/2001	<5	<5	<5	<5	45
RIDEM GB Groundwater Standards		140	1,700	1,600	NE	5,000

Notes:

- 1) µg/l = micrograms per kilogram, NE = not established
- 2) All samples analyzed via EPA Method 8260 plus MTBE
- 3) This table summarizes BTEX, and MTBE compounds only, refer to laboratory report for complete analytical data and method detection limits
- 4) Values in **BOLD** meet or exceed GB Groundwater Quality Standards from Rules and Regulations for Groundwater Quality



Printed from TOPOI ©1998 Wildflower Productions (www.topo.com)

FIGURE 1

SITE LOCATION MAP
 SOURCE: U.S.G.S.
 DATE: 1/17/00 DWG: RCF2031L
 LE JOB NO. RCF8338 BY: TM

 **Lincoln Environmental, Inc.**
 Smithfield, Rhode Island (401)232-3353

CUMBERLAND FARMS, INC.
 2064 SMITH STREET
 NORTH PROVIDENCE, RHODE ISLAND

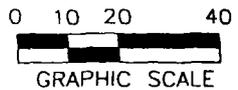
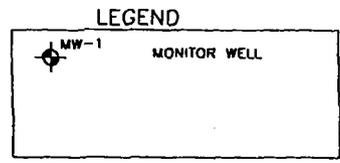
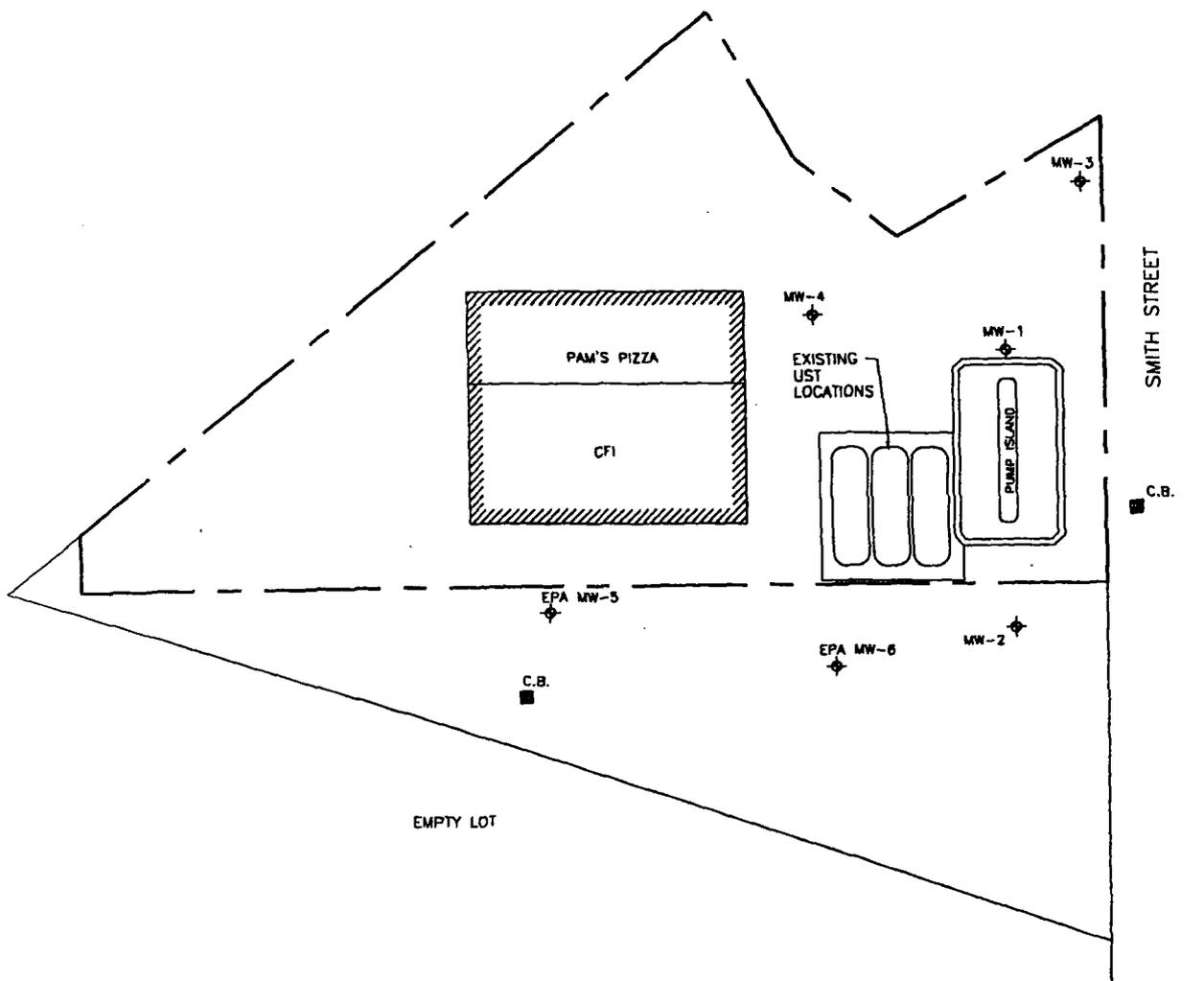


FIGURE 2

SITE PLAN

DATE: 2/20/01
 LE JOB NO. RCF8338

BY: TM
 DWG: RCF8338
 Copyright © Lincoln Environmental, Inc.



Lincoln Environmental, Inc.
 Smithfield, Rhode Island (401)232-3353

CUMBERLAND FARMS, INC.
 2064 SMITH STREET
 NORTH PROVIDENCE, RHODE ISLAND

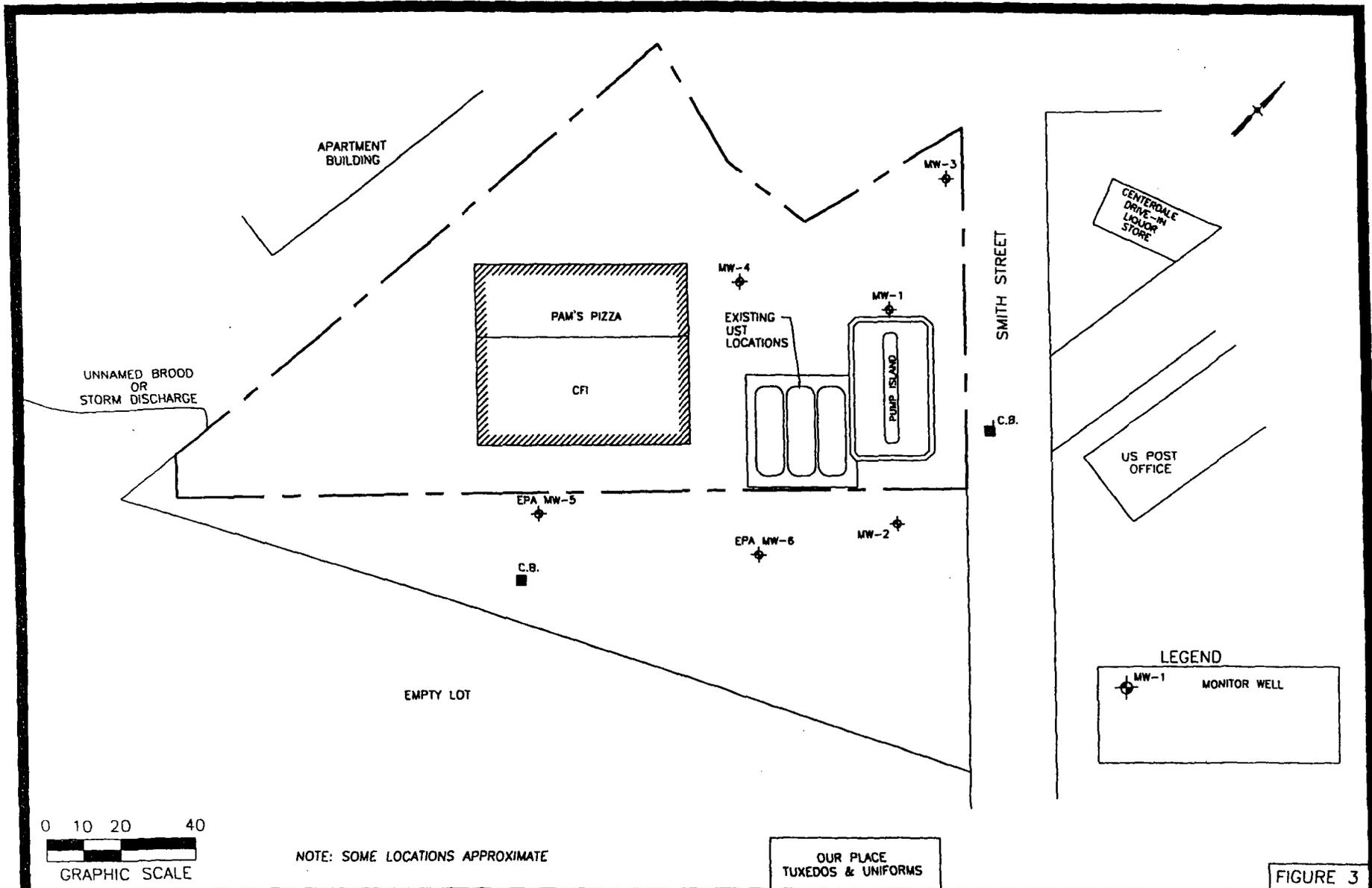


FIGURE 3

ABUTTERS MAP

DATE: 2/20/01
LE JOB NO. RCF8338

BY: TM
DWG: RCF8338
Copyright © Lincoln Environmental, Inc.



Lincoln Environmental, Inc.
Smithfield, Rhode Island (401)232-3353

CUMBERLAND FARMS, INC.
2064 SMITH STREET
NORTH PROVIDENCE, RHODE ISLAND

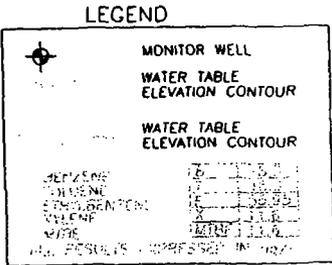
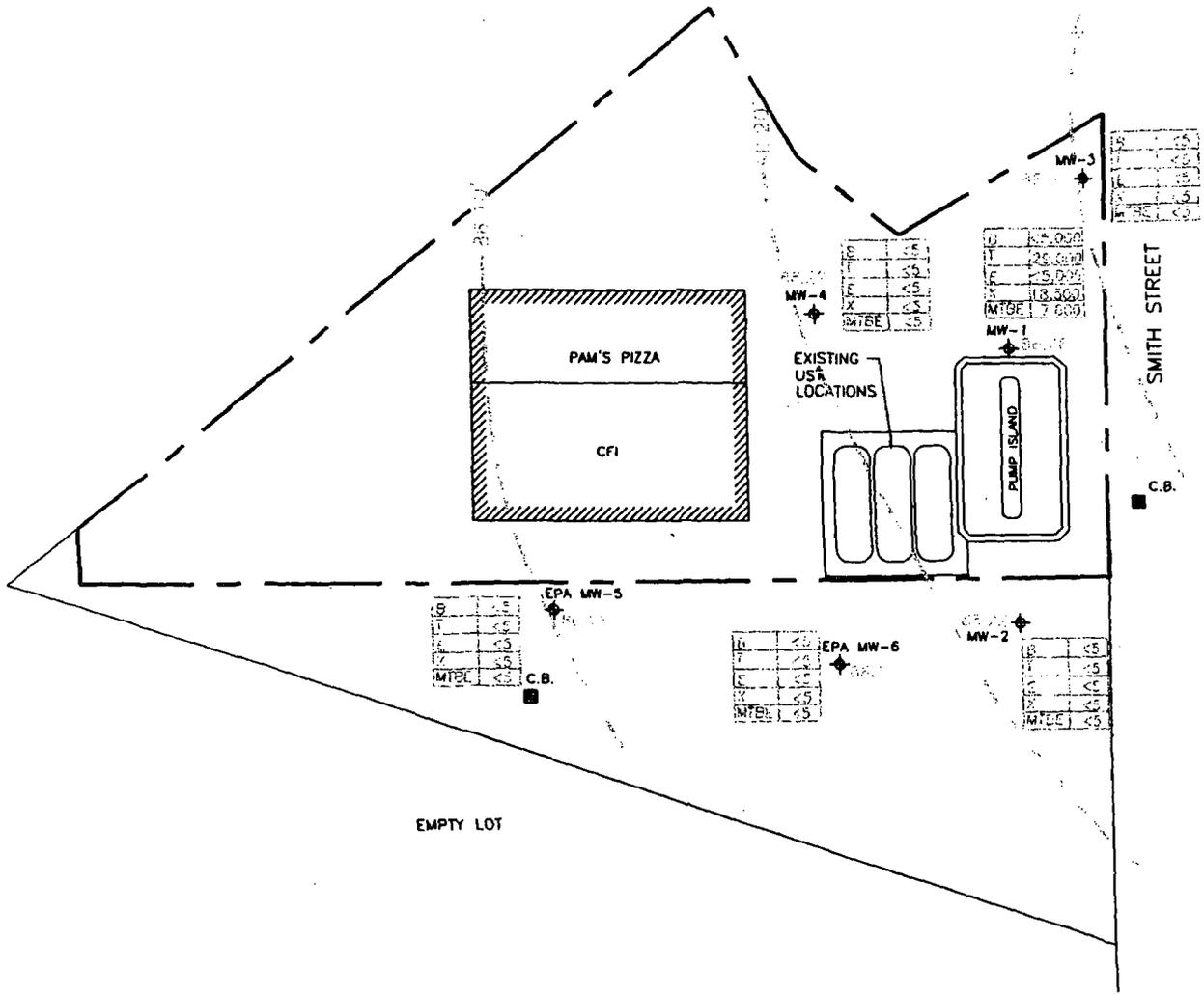


FIGURE 4

GROUNDWATER ANALYTICAL RESULTS AND
 WATER TABLE ELEVATION CONTOUR MAP
 FOR DATE: 1/25/2001

DATE: 2/20/01
 LE JOB NO. RCF8338

BY: TM
 DWG: RCF8338
 Copyright © Lincoln Environmental, Inc.



Lincoln Environmental, Inc.
 Smithfield, Rhode Island (401)232-3353

CUMBERLAND FARMS, INC.
 2064 SMITH STREET
 NORTH PROVIDENCE, RHODE ISLAND

TOXIKON CORPORATION
15 WIGGINS AVENUE
BEDFORD, MA 01730
TEL: (781) 275-3330

January 19, 2001

FEB 19 2001

DAVID BROCHU
LINCOLN ENVIRONMENTAL
333 WASHINGTON HIGHWAY
SMITHFIELD, RI 02917
TEL: (401) 232-3353
FAX: (401) 232-1130

RE: CFI #3843/NORTH PROVIDENCE

Order No.: 0101212

Dear DAVID BROCHU,

Toxikon received 3 samples on 1/12/01 for the analyses presented in the following report.

Unless noted in the report, there were no problems with the analyses and all data for associated QC met EPA or laboratory specifications.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,



Doug Sheeley

Certifications: MA: MA 064, NH: 204099D and 204099E, ME: MA064, RI: 55, VT: MA064, TN: MA064
NY: 10778, FL: E87143 and 87394, NC: 286, PA 68-461, CT: PH 0563, NJ: 59538, MD

Toxikon

Date: 19-Jan-01

CLIENT: LINCOLN ENVIRONMENTAL
Project: CFI #3843/NORTH PROVIDENCE
Lab Order: 0101212
Date Received: 1/12/01

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Collection Date
0101212-01A	MW-2	1/9/01
0101212-02A	MW-3	1/9/01
0101212-03A	MW-4	1/9/01

Toxikon

Date: 19-Jan-01

CLIENT: LINCOLN ENVIRONMENTAL
Lab Order: 0101212
Project: CFI #3843/NORTH PROVIDENCE
Lab ID: 0101212-01A

Client Sample ID: MW-2
Collection Date: 1/9/01
Matrix: SOIL

Analyses	Result	Rpt Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8260B				Analyst: SP
Benzene	ND	250		µg/Kg-dry	50	1/17/01 9:29:00 PM
Ethylbenzene	ND	250		µg/Kg-dry	50	1/17/01 9:29:00 PM
m,p-Xylene	ND	250		µg/Kg-dry	50	1/17/01 9:29:00 PM
Methyl tert-butyl ether	ND	250		µg/Kg-dry	50	1/17/01 9:29:00 PM
o-Xylene	ND	250		µg/Kg-dry	50	1/17/01 9:29:00 PM
Toluene	ND	250		µg/Kg-dry	50	1/17/01 9:29:00 PM

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Toxikon

Date: 19-Jan-01

CLIENT: LINCOLN ENVIRONMENTAL
Lab Order: 0101212
Project: CFI #3843/NORTH PROVIDENCE
Lab ID: 0101212-03A

Client Sample ID: MW-4
Collection Date: 1/9/01
Matrix: SOIL

Analyses	Result	Rpt Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS						Analyst: SP
		SW8260B				
Benzene	ND	250		µg/Kg-dry	50	1/17/01 10:29:00 PM
Ethylbenzene	ND	250		µg/Kg-dry	50	1/17/01 10:29:00 PM
m,p-Xylene	ND	250		µg/Kg-dry	50	1/17/01 10:29:00 PM
Methyl tert-butyl ether	ND	250		µg/Kg-dry	50	1/17/01 10:29:00 PM
o-Xylene	ND	250		µg/Kg-dry	50	1/17/01 10:29:00 PM
Toluene	ND	250		µg/Kg-dry	50	1/17/01 10:29:00 PM

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

TOXIKON CORPORATION
15 WIGGINS AVENUE
BEDFORD, MA 01730
TEL: (781) 275-3330

January 30, 2001

PAUL LECLERC
LINCOLN ENVIRONMENTAL
333 WASHINGTON HIGHWAY
SMITHFIELD, RI 02917
TEL: (401) 232-3353
FAX (401) 232-1130

RE: CFI #3843-N.PROV

Order No.: 0101473

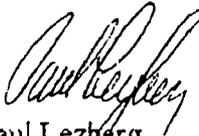
Dear PAUL LECLERC,

Toxikon received 6 samples on 1/28/01 for the analyses presented in the following report.

Unless noted in the report, there were no problems with the analyses and all data for associated QC met EPA or laboratory specifications.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,


Paul Lezberg

Certifications: MA: MA 064, NH: 204099D and 204099E, ME: MA064, RI: 35, VT: MA064, TN: MA064
NY: 10778, FL: E87143 and 87394, NC: 286, PA 68-461, CT: PH 0563, NJ: 59538, MD

TOXIKON

Date: 30-Jan-01

CLIENT: LINCOLN ENVIRONMENTAL
Project: CFI #3843-N.PROV
Lab Order: 0101473
Date Received: 1/28/01

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Collection Date
0101473-01A	MW-1	1/25/01
0101473-02A	MW-2	1/25/01
0101473-03A	MW-3	1/25/01
0101473-04A	MW-4	1/25/01
0101473-05A	MW-5	1/25/01
0101473-06A	MW-6	1/25/01

Toxikon

Date: 30-Jan-01

CLIENT:	LINCOLN ENVIRONMENTAL	Client Sample ID:	MW-1
Lab Order:	0101473	Collection Date:	1/25/01
Project:	CFI #3843-N.PROV	Matrix:	GROUNDWATER
Lab ID:	0101473-01A		

Analyses	Result	Rpt Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8280B				Analyst: SP
1,1,1,2-Tetrachloroethane	ND	5,000		µg/L	1000	1/30/01
1,1,1-Trichloroethane	ND	5,000		µg/L	1000	1/30/01
1,1,2,2-Tetrachloroethane	ND	5,000		µg/L	1000	1/30/01
1,1,2-Trichloroethane	ND	5,000		µg/L	1000	1/30/01
1,1-Dichloroethane	ND	5,000		µg/L	1000	1/30/01
1,1-Dichloroethene	ND	5,000		µg/L	1000	1/30/01
1,1-Dichloropropene	ND	5,000		µg/L	1000	1/30/01
1,2,3-Trichlorobenzene	ND	5,000		µg/L	1000	1/30/01
1,2,3-Trichloropropane	ND	5,000		µg/L	1000	1/30/01
1,2,4-Trichlorobenzene	ND	5,000		µg/L	1000	1/30/01
1,2,4-Trimethylbenzene	ND	5,000		µg/L	1000	1/30/01
1,2-Dibromo-3-chloropropane	ND	5,000		µg/L	1000	1/30/01
1,2-Dibromoethane	ND	5,000		µg/L	1000	1/30/01
1,2-Dichlorobenzene	ND	5,000		µg/L	1000	1/30/01
1,2-Dichloroethane	ND	5,000		µg/L	1000	1/30/01
1,2-Dichloroethene, Total	ND	5,000		µg/L	1000	1/30/01
1,2-Dichloropropane	ND	5,000		µg/L	1000	1/30/01
1,3,5-Trimethylbenzene	ND	5,000		µg/L	1000	1/30/01
1,3-Dichlorobenzene	ND	5,000		µg/L	1000	1/30/01
1,3-Dichloropropane	ND	5,000		µg/L	1000	1/30/01
1,4-Dichlorobenzene	ND	5,000		µg/L	1000	1/30/01
2,2-Dichloropropane	ND	5,000		µg/L	1000	1/30/01
2-Butanone	ND	10,000		µg/L	1000	1/30/01
2-Chloroethyl vinyl ether	ND	5,000		µg/L	1000	1/30/01
2-Chlorotoluene	ND	5,000		µg/L	1000	1/30/01
2-Hexanone	ND	10,000		µg/L	1000	1/30/01
4-Chlorotoluene	ND	5,000		µg/L	1000	1/30/01
4-Isopropyltoluene	ND	5,000		µg/L	1000	1/30/01
4-Methyl-2-pentanone	ND	10,000		µg/L	1000	1/30/01
Acetone	ND	10,000		µg/L	1000	1/30/01
Acrolein	ND	100,000		µg/L	1000	1/30/01
Benzene	ND	5,000		µg/L	1000	1/30/01
Bromobenzene	ND	5,000		µg/L	1000	1/30/01
Bromochloromethane	ND	5,000		µg/L	1000	1/30/01
Bromodichloromethane	ND	5,000		µg/L	1000	1/30/01
Bromoform	ND	5,000		µg/L	1000	1/30/01
Bromomethane	ND	5,000		µg/L	1000	1/30/01
Carbon disulfide	ND	5,000		µg/L	1000	1/30/01
Carbon tetrachloride	ND	5,000		µg/L	1000	1/30/01
Chlorobenzene	ND	5,000		µg/L	1000	1/30/01

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Toxikon

Date: 30-Jan-01

CLIENT: LINCOLN ENVIRONMENTAL
Lab Order: 0101473
Project: CFI #3843-N.PROV
Lab ID: 0101473-01A

Client Sample ID: MW-1
Collection Date: 1/25/01
Matrix: GROUNDWATER

Analyses	Result	Rpt Limit	Qual	Units	DF	Date Analyzed
Chloroethane	ND	5,000		µg/L	1000	1/30/01
Chloroform	ND	5,000		µg/L	1000	1/30/01
Chloromethane	ND	5,000		µg/L	1000	1/30/01
cis-1,2-Dichloroethene	ND	5,000		µg/L	1000	1/30/01
cis-1,3-Dichloropropene	ND	5,000		µg/L	1000	1/30/01
Dibromochloromethane	ND	5,000		µg/L	1000	1/30/01
Dibromomethane	ND	5,000		µg/L	1000	1/30/01
Dichlorodifluoromethane	ND	5,000		µg/L	1000	1/30/01
Diethyl Ether	ND	5,000		µg/L	1000	1/30/01
Ethylbenzene	ND	5,000		µg/L	1000	1/30/01
Hexachlorobutadiene	ND	5,000		µg/L	1000	1/30/01
Iodomethane	ND	5,000		µg/L	1000	1/30/01
Isopropylbenzene	ND	5,000		µg/L	1000	1/30/01
m,p-Xylene	13,000	5,000		µg/L	1000	1/30/01
Methyl tert-butyl ether	7,600	5,000		µg/L	1000	1/30/01
Methylene chloride	ND	5,000		µg/L	1000	1/30/01
n-Butylbenzene	ND	5,000		µg/L	1000	1/30/01
n-Propylbenzene	ND	5,000		µg/L	1000	1/30/01
Naphthalene	ND	5,000		µg/L	1000	1/30/01
o-Xylene	5,500	5,000		µg/L	1000	1/30/01
sec-Butylbenzene	ND	5,000		µg/L	1000	1/30/01
Styrene	ND	5,000		µg/L	1000	1/30/01
tert-Butylbenzene	ND	5,000		µg/L	1000	1/30/01
Tetrachloroethene	ND	5,000		µg/L	1000	1/30/01
Tetrahydrofuran	ND	10,000		µg/L	1000	1/30/01
Toluene	29,000	5,000		µg/L	1000	1/30/01
trans-1,2-Dichloroethene	ND	5,000		µg/L	1000	1/30/01
trans-1,3-Dichloropropene	ND	5,000		µg/L	1000	1/30/01
Trichloroethene	ND	5,000		µg/L	1000	1/30/01
Trichlorofluoromethane	ND	5,000		µg/L	1000	1/30/01
Vinyl acetate	ND	5,000		µg/L	1000	1/30/01
Vinyl chloride	ND	5,000		µg/L	1000	1/30/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Toxikon

Date: 30-Jan-01

CLIENT: LINCOLN ENVIRONMENTAL
 Lab Order: 0101473
 Project: CFI #3843-N.PROV
 Lab ID: 0101473-02A

Client Sample ID: MW-2
 Collection Date: 1/25/01
 Matrix: GROUND WATER

Analyses	Result	Rpt Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8260B				Analyst: SP
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	1	1/30/01
1,1,1-Trichloroethane	ND	5.0		µg/L	1	1/30/01
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	1	1/30/01
1,1,2-Trichloroethane	ND	5.0		µg/L	1	1/30/01
1,1-Dichloroethane	ND	5.0		µg/L	1	1/30/01
1,1-Dichloroethene	ND	5.0		µg/L	1	1/30/01
1,1-Dichloropropane	ND	5.0		µg/L	1	1/30/01
1,2,3-Trichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2,3-Trichloropropane	ND	5.0		µg/L	1	1/30/01
1,2,4-Trichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2,4-Trimethylbenzene	ND	5.0		µg/L	1	1/30/01
1,2-Dibromo-3-chloropropane	ND	5.0		µg/L	1	1/30/01
1,2-Dibromoethane	ND	5.0		µg/L	1	1/30/01
1,2-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2-Dichloroethane	ND	5.0		µg/L	1	1/30/01
1,2-Dichloroethene, Total	ND	5.0		µg/L	1	1/30/01
1,2-Dichloropropane	ND	5.0		µg/L	1	1/30/01
1,3,5-Trimethylbenzene	ND	5.0		µg/L	1	1/30/01
1,3-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,3-Dichloropropane	ND	5.0		µg/L	1	1/30/01
1,4-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
2,2-Dichloropropane	ND	5.0		µg/L	1	1/30/01
2-Butanone	ND	10		µg/L	1	1/30/01
2-Chloroethyl vinyl ether	ND	5.0		µg/L	1	1/30/01
2-Chlorotoluene	ND	5.0		µg/L	1	1/30/01
2-Hexanone	ND	10		µg/L	1	1/30/01
4-Chlorotoluene	ND	5.0		µg/L	1	1/30/01
4-Isopropyltoluene	ND	5.0		µg/L	1	1/30/01
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/01
Acetone	ND	10		µg/L	1	1/30/01
Acrolein	ND	100		µg/L	1	1/30/01
Benzene	ND	5.0		µg/L	1	1/30/01
Bromobenzene	ND	5.0		µg/L	1	1/30/01
Bromochloromethane	ND	5.0		µg/L	1	1/30/01
Bromodichloromethane	ND	5.0		µg/L	1	1/30/01
Bromoform	ND	5.0		µg/L	1	1/30/01
Bromomethane	ND	5.0		µg/L	1	1/30/01
Carbon disulfide	ND	5.0		µg/L	1	1/30/01
Carbon tetrachloride	ND	5.0		µg/L	1	1/30/01
Chlorobenzene	ND	5.0		µg/L	1	1/30/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Toxikon

Date: 30-Jan-01

CLIENT: LINCOLN ENVIRONMENTAL
 Lab Order: 0101473
 Project: CFI #3843-N.PROV
 Lab ID: 0101473-02A

Client Sample ID: MW-2
 Collection Date: 1/25/01
 Matrix: GROUNDWATER

Analyses	Result	Rpt Limit	Qual	Units	DF	Date Analyzed
Chloroethane	ND	5.0		µg/L	1	1/30/01
Chloroform	ND	5.0		µg/L	1	1/30/01
Chloromethane	ND	5.0		µg/L	1	1/30/01
cis-1,2-Dichloroethene	ND	5.0		µg/L	1	1/30/01
cis-1,3-Dichloropropene	ND	5.0		µg/L	1	1/30/01
Dibromochloromethane	ND	5.0		µg/L	1	1/30/01
Dibromomethane	ND	5.0		µg/L	1	1/30/01
Dichlorodifluoromethane	ND	5.0		µg/L	1	1/30/01
Diethyl Ether	ND	5.0		µg/L	1	1/30/01
Ethylbenzene	ND	5.0		µg/L	1	1/30/01
Hexachlorobutadiene	ND	5.0		µg/L	1	1/30/01
Iodomethane	ND	5.0		µg/L	1	1/30/01
Isopropylbenzene	ND	5.0		µg/L	1	1/30/01
m,p-Xylene	ND	5.0		µg/L	1	1/30/01
Methyl tert-butyl ether	ND	5.0		µg/L	1	1/30/01
Methylene chloride	ND	5.0		µg/L	1	1/30/01
n-Butylbenzene	ND	5.0		µg/L	1	1/30/01
n-Propylbenzene	ND	5.0		µg/L	1	1/30/01
Naphthalene	ND	5.0		µg/L	1	1/30/01
o-Xylene	ND	5.0		µg/L	1	1/30/01
sec-Butylbenzene	ND	5.0		µg/L	1	1/30/01
Styrene	ND	5.0		µg/L	1	1/30/01
tert-Butylbenzene	ND	5.0		µg/L	1	1/30/01
Tetrachloroethene	ND	5.0		µg/L	1	1/30/01
Tetrahydrofuran	ND	10		µg/L	1	1/30/01
Toluene	ND	5.0		µg/L	1	1/30/01
trans-1,2-Dichloroethene	ND	5.0		µg/L	1	1/30/01
trans-1,3-Dichloropropene	ND	5.0		µg/L	1	1/30/01
Trichloroethene	ND	5.0		µg/L	1	1/30/01
Trichlorofluoromethane	ND	5.0		µg/L	1	1/30/01
Vinyl acetate	ND	5.0		µg/L	1	1/30/01
Vinyl chloride	ND	5.0		µg/L	1	1/30/01

Qualifiers: ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Toxikon

Date: 30-Jan-01

CLIENT: LINCOLN ENVIRONMENTAL
Lab Order: 0101473
Project: CFI #3843-N.PROV
Lab ID: 0101473-03A

Client Sample ID: MW-3
Collection Date: 1/25/01
Matrix: GROUNDWATER

Analyses	Result	Rpt Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8260B				Analyst: SP
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	1	1/30/01
1,1,1-Trichloroethane	ND	5.0		µg/L	1	1/30/01
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	1	1/30/01
1,1,2-Trichloroethane	ND	5.0		µg/L	1	1/30/01
1,1-Dichloroethane	ND	5.0		µg/L	1	1/30/01
1,1-Dichloroethene	ND	5.0		µg/L	1	1/30/01
1,1-Dichloropropene	ND	5.0		µg/L	1	1/30/01
1,2,3-Trichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2,3-Trichloropropane	ND	5.0		µg/L	1	1/30/01
1,2,4-Trichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2,4-Trimethylbenzene	ND	5.0		µg/L	1	1/30/01
1,2-Dibromo-3-chloropropane	ND	5.0		µg/L	1	1/30/01
1,2-Dibromoethane	ND	5.0		µg/L	1	1/30/01
1,2-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2-Dichloroethane	ND	5.0		µg/L	1	1/30/01
1,2-Dichloroethene, Total	ND	5.0		µg/L	1	1/30/01
1,2-Dichloropropane	ND	5.0		µg/L	1	1/30/01
1,3,5-Trimethylbenzene	ND	5.0		µg/L	1	1/30/01
1,3-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,3-Dichloropropane	ND	5.0		µg/L	1	1/30/01
1,4-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
2,2-Dichloropropane	ND	5.0		µg/L	1	1/30/01
2-Butanone	ND	10		µg/L	1	1/30/01
2-Chloroethyl vinyl ether	ND	5.0		µg/L	1	1/30/01
2-Chlorotoluene	ND	5.0		µg/L	1	1/30/01
2-Hexanone	ND	10		µg/L	1	1/30/01
4-Chlorotoluene	ND	5.0		µg/L	1	1/30/01
4-Isopropyltoluene	ND	5.0		µg/L	1	1/30/01
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/01
Acetone	ND	10		µg/L	1	1/30/01
Acrolein	ND	100		µg/L	1	1/30/01
Benzene	ND	5.0		µg/L	1	1/30/01
Bromobenzene	ND	5.0		µg/L	1	1/30/01
Bromochloromethane	ND	5.0		µg/L	1	1/30/01
Bromodichloromethane	ND	5.0		µg/L	1	1/30/01
Bromoform	ND	5.0		µg/L	1	1/30/01
Bromomethane	ND	5.0		µg/L	1	1/30/01
Carbon disulfide	ND	5.0		µg/L	1	1/30/01
Carbon tetrachloride	ND	5.0		µg/L	1	1/30/01
Chlorobenzene	ND	5.0		µg/L	1	1/30/01

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Toxikon

Date: 30-Jan-01

CLIENT:	LINCOLN ENVIRONMENTAL	Client Sample ID:	MW-3
Lab Order:	0101473	Collection Date:	1/25/01
Project:	CFI #3843-N.PROV	Matrix:	GROUNDWATER
Lab ID:	0101473-03A		

Analyses	Result	Rpt Limit	Qual	Units	DF	Date Analyzed
Chloroethane	ND	5.0		µg/L	1	1/30/01
Chloroform	ND	5.0		µg/L	1	1/30/01
Chloromethane	ND	5.0		µg/L	1	1/30/01
cis-1,2-Dichloroethene	ND	5.0		µg/L	1	1/30/01
cis-1,3-Dichloropropene	ND	5.0		µg/L	1	1/30/01
Dibromochloromethane	ND	5.0		µg/L	1	1/30/01
Dibromomethane	ND	5.0		µg/L	1	1/30/01
Dichlorodifluoromethane	ND	5.0		µg/L	1	1/30/01
Diethyl Ether	ND	5.0		µg/L	1	1/30/01
Ethylbenzene	ND	5.0		µg/L	1	1/30/01
Hexachlorobutadiene	ND	5.0		µg/L	1	1/30/01
Iodomethane	ND	5.0		µg/L	1	1/30/01
Isopropylbenzene	ND	5.0		µg/L	1	1/30/01
m,p-Xylene	ND	5.0		µg/L	1	1/30/01
Methyl tert-butyl ether	ND	5.0		µg/L	1	1/30/01
Methylene chloride	ND	5.0		µg/L	1	1/30/01
n-Butylbenzene	ND	5.0		µg/L	1	1/30/01
n-Propylbenzene	ND	5.0		µg/L	1	1/30/01
Naphthalene	ND	5.0		µg/L	1	1/30/01
o-Xylene	ND	5.0		µg/L	1	1/30/01
sec-Butylbenzene	ND	5.0		µg/L	1	1/30/01
Styrene	ND	5.0		µg/L	1	1/30/01
tert-Butylbenzene	ND	5.0		µg/L	1	1/30/01
Tetrachloroethene	ND	5.0		µg/L	1	1/30/01
Tetrahydrofuran	ND	10		µg/L	1	1/30/01
Toluene	ND	5.0		µg/L	1	1/30/01
trans-1,2-Dichloroethene	ND	5.0		µg/L	1	1/30/01
trans-1,3-Dichloropropene	ND	5.0		µg/L	1	1/30/01
Trichloroethene	ND	5.0		µg/L	1	1/30/01
Trichlorofluoromethane	ND	5.0		µg/L	1	1/30/01
Vinyl acetate	ND	5.0		µg/L	1	1/30/01
Vinyl chloride	ND	5.0		µg/L	1	1/30/01

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Toxikon

Date: 30-Jan-01

CLIENT: LINCOLN ENVIRONMENTAL
Lab Order: 0101473
Project: CFI #3843-N.PROV
Lab ID: 0101473-04A

Client Sample ID: MW-4
Collection Date: 1/25/01
Matrix: GROUNDWATER

Analyses	Result	Rpt Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8280B				Analyst SP
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	1	1/30/01
1,1,1-Trichloroethane	ND	5.0		µg/L	1	1/30/01
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	1	1/30/01
1,1,2-Trichloroethane	ND	5.0		µg/L	1	1/30/01
1,1-Dichloroethane	ND	5.0		µg/L	1	1/30/01
1,1-Dichloroethene	ND	5.0		µg/L	1	1/30/01
1,1-Dichloropropane	ND	5.0		µg/L	1	1/30/01
1,2,3-Trichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2,3-Trichloropropane	ND	5.0		µg/L	1	1/30/01
1,2,4-Trichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2,4-Trimethylbenzene	ND	5.0		µg/L	1	1/30/01
1,2-Dibromo-3-chloropropane	ND	5.0		µg/L	1	1/30/01
1,2-Dibromoethane	ND	5.0		µg/L	1	1/30/01
1,2-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2-Dichloroethane	ND	5.0		µg/L	1	1/30/01
1,2-Dichloroethene, Total	ND	5.0		µg/L	1	1/30/01
1,2-Dichloropropane	ND	5.0		µg/L	1	1/30/01
1,3,5-Trimethylbenzene	ND	5.0		µg/L	1	1/30/01
1,3-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,3-Dichloropropane	ND	5.0		µg/L	1	1/30/01
1,4-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
2,2-Dichloropropane	ND	5.0		µg/L	1	1/30/01
2-Butanone	ND	10		µg/L	1	1/30/01
2-Chloroethyl vinyl ether	ND	5.0		µg/L	1	1/30/01
2-Chlorotoluene	ND	5.0		µg/L	1	1/30/01
2-Hexanone	ND	10		µg/L	1	1/30/01
4-Chlorotoluene	ND	5.0		µg/L	1	1/30/01
4-Isopropyltoluene	ND	5.0		µg/L	1	1/30/01
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/01
Acetone	ND	10		µg/L	1	1/30/01
Acrolein	ND	100		µg/L	1	1/30/01
Benzene	ND	5.0		µg/L	1	1/30/01
Bromobenzene	ND	5.0		µg/L	1	1/30/01
Bromochloromethane	ND	5.0		µg/L	1	1/30/01
Bromodichloromethane	ND	5.0		µg/L	1	1/30/01
Bromoform	ND	5.0		µg/L	1	1/30/01
Bromomethane	ND	5.0		µg/L	1	1/30/01
Carbon disulfide	ND	5.0		µg/L	1	1/30/01
Carbon tetrachloride	ND	5.0		µg/L	1	1/30/01
Chlorobenzene	ND	5.0		µg/L	1	1/30/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Toxikon

Date: 30-Jan-01

CLIENT:	LINCOLN ENVIRONMENTAL	Client Sample ID:	MW-4
Lab Order:	0101473	Collection Date:	1/25/01
Project:	CFI #3843-N.PROV	Matrix:	GROUNDWATER
Lab ID:	0101473-04A		

Analyses	Result	Rpt Limit	Qual	Units	DF	Date Analyzed
Chloroethane	ND	5.0		µg/L	1	1/30/01
Chloroform	ND	5.0		µg/L	1	1/30/01
Chloromethane	ND	5.0		µg/L	1	1/30/01
cis-1,2-Dichloroethane	ND	5.0		µg/L	1	1/30/01
cis-1,3-Dichloropropene	ND	5.0		µg/L	1	1/30/01
Dibromochloromethane	ND	5.0		µg/L	1	1/30/01
Dibromomethane	ND	5.0		µg/L	1	1/30/01
Dichlorodifluoromethane	ND	5.0		µg/L	1	1/30/01
Diethyl Ether	ND	5.0		µg/L	1	1/30/01
Ethylbenzene	ND	5.0		µg/L	1	1/30/01
Hexachlorobutadiene	ND	5.0		µg/L	1	1/30/01
Iodomethane	ND	5.0		µg/L	1	1/30/01
Isopropylbenzene	ND	5.0		µg/L	1	1/30/01
m,p-Xylene	ND	5.0		µg/L	1	1/30/01
Methyl tert-butyl ether	ND	5.0		µg/L	1	1/30/01
Methylene chloride	ND	5.0		µg/L	1	1/30/01
n-Butylbenzene	ND	5.0		µg/L	1	1/30/01
n-Propylbenzene	ND	5.0		µg/L	1	1/30/01
Naphthalene	ND	5.0		µg/L	1	1/30/01
o-Xylene	ND	5.0		µg/L	1	1/30/01
sec-Butylbenzene	ND	5.0		µg/L	1	1/30/01
Styrene	ND	5.0		µg/L	1	1/30/01
tert-Butylbenzene	ND	5.0		µg/L	1	1/30/01
Tetrachloroethene	ND	5.0		µg/L	1	1/30/01
Tetrahydrofuran	ND	10		µg/L	1	1/30/01
Toluene	ND	5.0		µg/L	1	1/30/01
trans-1,2-Dichloroethene	ND	5.0		µg/L	1	1/30/01
trans-1,3-Dichloropropene	ND	5.0		µg/L	1	1/30/01
Trichloroethane	ND	5.0		µg/L	1	1/30/01
Trichlorofluoromethane	ND	5.0		µg/L	1	1/30/01
Vinyl acetate	ND	5.0		µg/L	1	1/30/01
Vinyl chloride	ND	5.0		µg/L	1	1/30/01

Qualifiers:	ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits
	J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits
	B - Analyte detected in the associated Method Blank	E - Value above quantitation range
	± - Value exceeds Maximum Contaminant Level	

Toxikon

Date: 30-Jan-01

CLIENT: LINCOLN ENVIRONMENTAL
 Lab Order: 0101473
 Project: CFI #3843-N.PROV
 Lab ID: 0101473-05A

Client Sample ID: MW-5
 Collection Date: 1/25/01
 Matrix: GROUNDWATER

Analyses	Result	Rpt Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8280B		Analyst SP		
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	1	1/30/01
1,1,1-Trichloroethane	ND	5.0		µg/L	1	1/30/01
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	1	1/30/01
1,1,2-Trichloroethane	ND	5.0		µg/L	1	1/30/01
1,1-Dichloroethane	ND	5.0		µg/L	1	1/30/01
1,1-Dichloroethene	ND	5.0		µg/L	1	1/30/01
1,1-Dichloropropene	ND	5.0		µg/L	1	1/30/01
1,2,3-Trichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2,3-Trichloropropane	ND	5.0		µg/L	1	1/30/01
1,2,4-Trichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2,4-Trimethylbenzene	ND	5.0		µg/L	1	1/30/01
1,2-Dibromo-3-chloropropane	ND	5.0		µg/L	1	1/30/01
1,2-Dibromoethane	ND	5.0		µg/L	1	1/30/01
1,2-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2-Dichloroethane	ND	5.0		µg/L	1	1/30/01
1,2-Dichloroethene, Total	ND	5.0		µg/L	1	1/30/01
1,2-Dichloropropane	ND	5.0		µg/L	1	1/30/01
1,3,5-Trimethylbenzene	ND	5.0		µg/L	1	1/30/01
1,3-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,3-Dichloropropane	ND	5.0		µg/L	1	1/30/01
1,4-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
2,2-Dichloropropane	ND	5.0		µg/L	1	1/30/01
2-Butanone	ND	10		µg/L	1	1/30/01
2-Chloroethyl vinyl ether	ND	5.0		µg/L	1	1/30/01
2-Chlorotoluene	ND	5.0		µg/L	1	1/30/01
2-Hexanone	ND	10		µg/L	1	1/30/01
4-Chlorotoluene	ND	5.0		µg/L	1	1/30/01
4-Isopropyltoluene	ND	5.0		µg/L	1	1/30/01
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/01
Acetone	ND	10		µg/L	1	1/30/01
Acrolein	ND	100		µg/L	1	1/30/01
Benzene	ND	5.0		µg/L	1	1/30/01
Bromobenzene	ND	5.0		µg/L	1	1/30/01
Bromochloromethane	ND	5.0		µg/L	1	1/30/01
Bromodichloromethane	ND	5.0		µg/L	1	1/30/01
Bromoform	ND	5.0		µg/L	1	1/30/01
Bromomethane	ND	5.0		µg/L	1	1/30/01
Carbon disulfide	ND	5.0		µg/L	1	1/30/01
Carbon tetrachloride	ND	5.0		µg/L	1	1/30/01
Chlorobenzene	ND	5.0		µg/L	1	1/30/01

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Toxikon

Date: 30-Jan-01

CLIENT: LINCOLN ENVIRONMENTAL
Lab Order: 0101473
Project: CFI #3843-N.PROV
Lab ID: 0101473-05A

Client Sample ID: MW-5
Collection Date: 1/25/01
Matrix: GROUNDWATER

Analyses	Result	Rpt Limit	Qual	Units	DF	Date Analyzed
Chloroethane	ND	5.0		µg/L	1	1/30/01
Chloroform	ND	5.0		µg/L	1	1/30/01
Chloromethane	ND	5.0		µg/L	1	1/30/01
cis-1,2-Dichloroethene	ND	5.0		µg/L	1	1/30/01
cis-1,3-Dichloropropene	ND	5.0		µg/L	1	1/30/01
Dibromochloromethane	ND	5.0		µg/L	1	1/30/01
Dibromomethane	ND	5.0		µg/L	1	1/30/01
Dichlorodifluoromethane	ND	5.0		µg/L	1	1/30/01
Diethyl Ether	ND	5.0		µg/L	1	1/30/01
Ethylbenzene	ND	5.0		µg/L	1	1/30/01
Hexachlorobutadiene	ND	5.0		µg/L	1	1/30/01
Iodomethane	ND	5.0		µg/L	1	1/30/01
Isopropylbenzene	ND	5.0		µg/L	1	1/30/01
m,p-Xylene	ND	5.0		µg/L	1	1/30/01
Methyl tert-butyl ether	ND	5.0		µg/L	1	1/30/01
Methylene chloride	ND	5.0		µg/L	1	1/30/01
n-Butylbenzene	ND	5.0		µg/L	1	1/30/01
n-Propylbenzene	ND	5.0		µg/L	1	1/30/01
Naphthalene	ND	5.0		µg/L	1	1/30/01
o-Xylene	ND	5.0		µg/L	1	1/30/01
sec-Butylbenzene	ND	5.0		µg/L	1	1/30/01
Styrene	ND	5.0		µg/L	1	1/30/01
tert-Butylbenzene	ND	5.0		µg/L	1	1/30/01
Tetrachloroethene	ND	5.0		µg/L	1	1/30/01
Tetrahydrofuran	ND	10		µg/L	1	1/30/01
Toluene	ND	5.0		µg/L	1	1/30/01
trans-1,2-Dichloroethene	ND	5.0		µg/L	1	1/30/01
trans-1,3-Dichloropropene	ND	5.0		µg/L	1	1/30/01
Trichloroethene	ND	5.0		µg/L	1	1/30/01
Trichlorofluoromethane	ND	5.0		µg/L	1	1/30/01
Vinyl acetate	ND	5.0		µg/L	1	1/30/01
Vinyl chloride	ND	5.0		µg/L	1	1/30/01

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Toxikon

Date: 30-Jan-01

CLIENT:	LINCOLN ENVIRONMENTAL	Client Sample ID:	MW-6
Lab Order:	0101473	Collection Date:	1/25/01
Project:	CFI #3843-N.PROV	Matrix:	GROUNDWATER
Lab ID:	0101473-06A		

Analyses	Result	Rpt Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8260B				Analyst SP
1,1,1,2-Tetrachloroethane	ND	5.0		µg/L	1	1/30/01
1,1,1-Trichloroethane	ND	5.0		µg/L	1	1/30/01
1,1,2,2-Tetrachloroethane	ND	5.0		µg/L	1	1/30/01
1,1,2-Trichloroethane	ND	5.0		µg/L	1	1/30/01
1,1-Dichloroethane	ND	5.0		µg/L	1	1/30/01
1,1-Dichloroethene	ND	5.0		µg/L	1	1/30/01
1,1-Dichloropropene	ND	5.0		µg/L	1	1/30/01
1,2,3-Trichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2,3-Trichloropropane	ND	5.0		µg/L	1	1/30/01
1,2,4-Trichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2,4-Trimethylbenzene	ND	5.0		µg/L	1	1/30/01
1,2-Dibromo-3-chloropropane	ND	5.0		µg/L	1	1/30/01
1,2-Dibromoethane	ND	5.0		µg/L	1	1/30/01
1,2-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,2-Dichloroethane	ND	5.0		µg/L	1	1/30/01
1,2-Dichloroethene, Total	ND	5.0		µg/L	1	1/30/01
1,2-Dichloropropane	ND	5.0		µg/L	1	1/30/01
1,3,5-Trimethylbenzene	ND	5.0		µg/L	1	1/30/01
1,3-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
1,3-Dichloropropane	ND	5.0		µg/L	1	1/30/01
1,4-Dichlorobenzene	ND	5.0		µg/L	1	1/30/01
2,2-Dichloropropane	ND	5.0		µg/L	1	1/30/01
2-Butanone	ND	10		µg/L	1	1/30/01
2-Chloroethyl vinyl ether	ND	5.0		µg/L	1	1/30/01
2-Chlorotoluene	ND	5.0		µg/L	1	1/30/01
2-Hexanone	ND	10		µg/L	1	1/30/01
4-Chlorotoluene	ND	5.0		µg/L	1	1/30/01
4-Isopropyltoluene	ND	5.0		µg/L	1	1/30/01
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/01
Acetone	ND	10		µg/L	1	1/30/01
Acrolein	ND	100		µg/L	1	1/30/01
Benzene	ND	5.0		µg/L	1	1/30/01
Bromobenzene	ND	5.0		µg/L	1	1/30/01
Bromochloromethane	ND	5.0		µg/L	1	1/30/01
Bromodichloromethane	ND	5.0		µg/L	1	1/30/01
Bromoform	ND	5.0		µg/L	1	1/30/01
Bromomethane	ND	5.0		µg/L	1	1/30/01
Carbon disulfide	ND	5.0		µg/L	1	1/30/01
Carbon tetrachloride	ND	5.0		µg/L	1	1/30/01
Chlorobenzene	ND	5.0		µg/L	1	1/30/01

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Toxikon

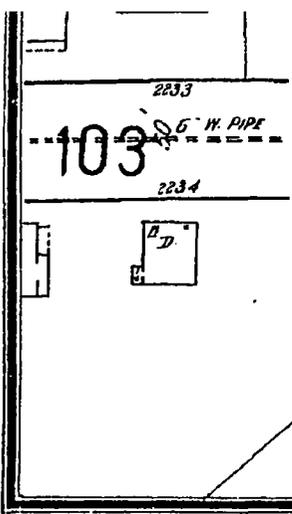
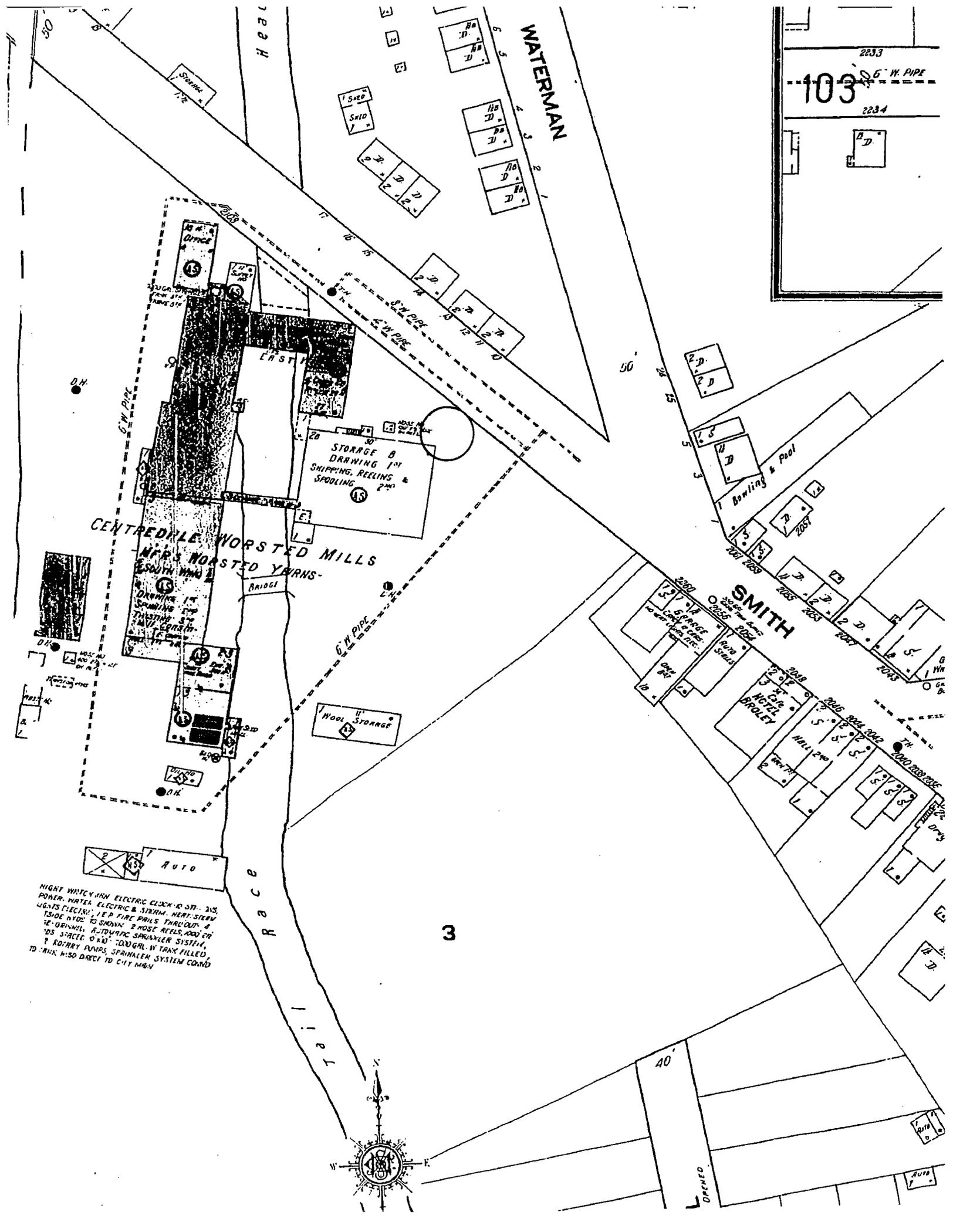
Date: 30-Jan-01

CLIENT: LINCOLN ENVIRONMENTAL
Lab Order: 0101473
Project: CFI #3843-N.PROV
Lab ID: 0101473-06A

Client Sample ID: MW-6
Collection Date: 1/25/01
Matrix: GROUNDWATER

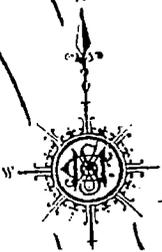
Analyses	Result	Rpt Limit	Qual	Units	DF	Date Analyzed
Chloroethane	ND	5.0		µg/L	1	1/30/01
Chlorofom	ND	5.0		µg/L	1	1/30/01
Chloromethane	ND	5.0		µg/L	1	1/30/01
cis-1,2-Dichloroethane	ND	5.0		µg/L	1	1/30/01
cis-1,3-Dichloropropene	ND	5.0		µg/L	1	1/30/01
Dibromochloromethane	ND	5.0		µg/L	1	1/30/01
Dibromomethane	ND	5.0		µg/L	1	1/30/01
Dichlorodifluoromethane	ND	5.0		µg/L	1	1/30/01
Diethyl Ether	ND	5.0		µg/L	1	1/30/01
Ethylbenzene	ND	5.0		µg/L	1	1/30/01
Hexachlorobutadiene	ND	5.0		µg/L	1	1/30/01
Iodomethane	ND	5.0		µg/L	1	1/30/01
Isopropylbenzene	ND	5.0		µg/L	1	1/30/01
m,p-Xylene	ND	5.0		µg/L	1	1/30/01
Methyl tert-butyl ether	45	5.0		µg/L	1	1/30/01
Methylene chloride	ND	5.0		µg/L	1	1/30/01
n-Butylbenzene	ND	5.0		µg/L	1	1/30/01
n-Propylbenzene	ND	5.0		µg/L	1	1/30/01
Naphthalene	ND	5.0		µg/L	1	1/30/01
o-Xylene	ND	5.0		µg/L	1	1/30/01
sec-Butylbenzene	ND	5.0		µg/L	1	1/30/01
Styrene	ND	5.0		µg/L	1	1/30/01
tert-Butylbenzene	ND	5.0		µg/L	1	1/30/01
Tetrachloroethane	ND	5.0		µg/L	1	1/30/01
Tetrahydrofuran	ND	10		µg/L	1	1/30/01
Toluene	ND	5.0		µg/L	1	1/30/01
trans-1,2-Dichloroethene	ND	5.0		µg/L	1	1/30/01
trans-1,3-Dichloropropene	ND	5.0		µg/L	1	1/30/01
Trichloroethene	ND	5.0		µg/L	1	1/30/01
Trichlorofluoromethane	ND	5.0		µg/L	1	1/30/01
Vinyl acetate	ND	5.0		µg/L	1	1/30/01
Vinyl chloride	ND	5.0		µg/L	1	1/30/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range



NIGHT WATCHMAN ELECTRIC CLOCK IN ST. 2ND FLOOR. WATER, ELECTRIC & STEAM HEAT SYSTEMS (ELECTRIC) 1/2 IN. FIRE PIPES THROUGH 8" SIDE WYDS. TO SHOW 2 HOSE REELS, 200 FT. 1/2" DRINKING WATER SPRINKLER SYSTEM, 2 ROTARY PUMPS, SPRINKLER SYSTEM COND. TO RINK ALSO DIRECT TO CITY MAIN

3



DRENCH

40'

AUTO

Wool Storage

SMITH

HOTEL BROLEY

Bowling & Pool

STORAGE & DRAWING 1st SHIPPING, REELING & SPOOLING

CENTREDALE WORSTED MILLS
Wool Storage
Drawing, Spinning, Twisting, & Finishing

WATERMAN

Race River

Race River

C.M. PIPE

C.M. PIPE

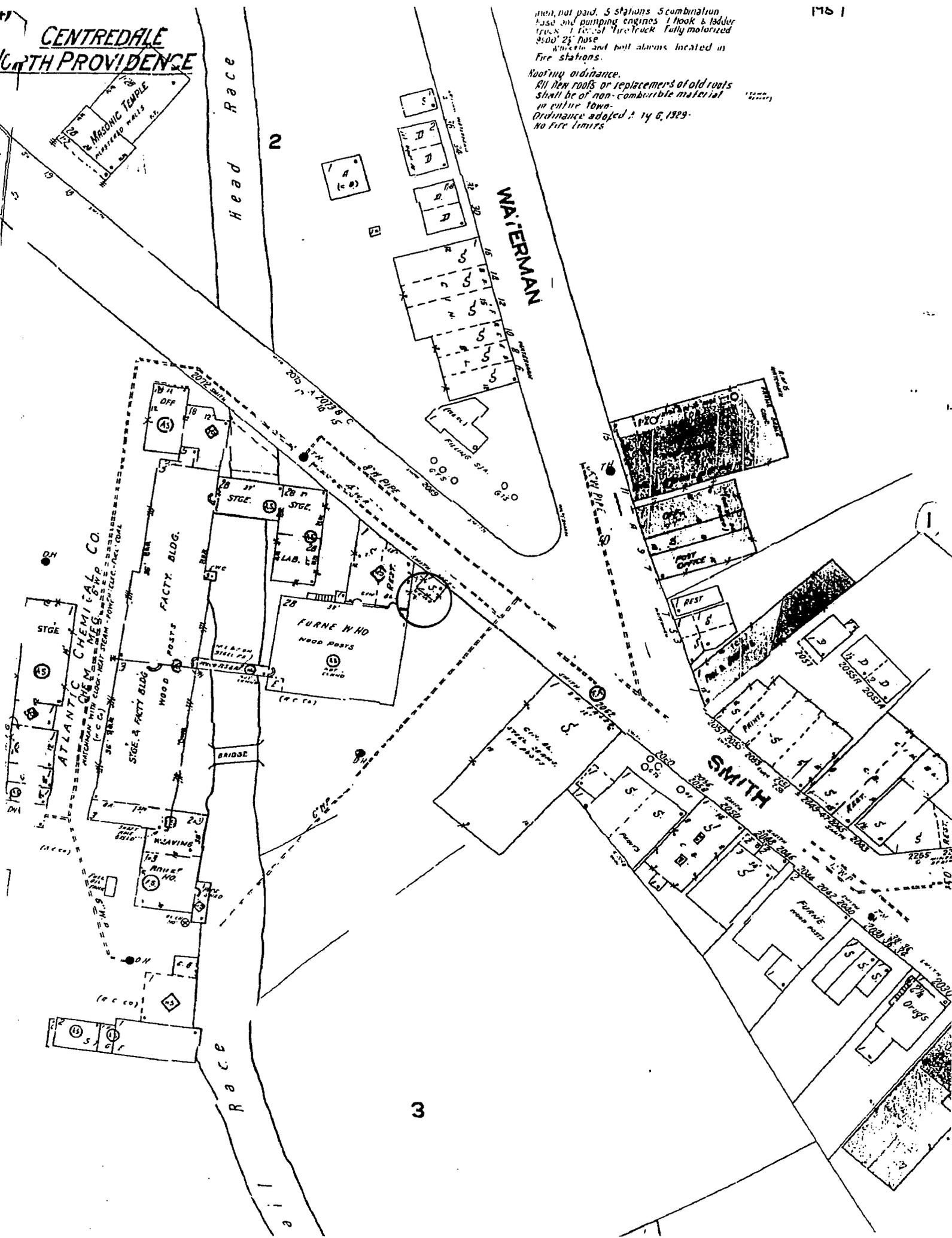
Office

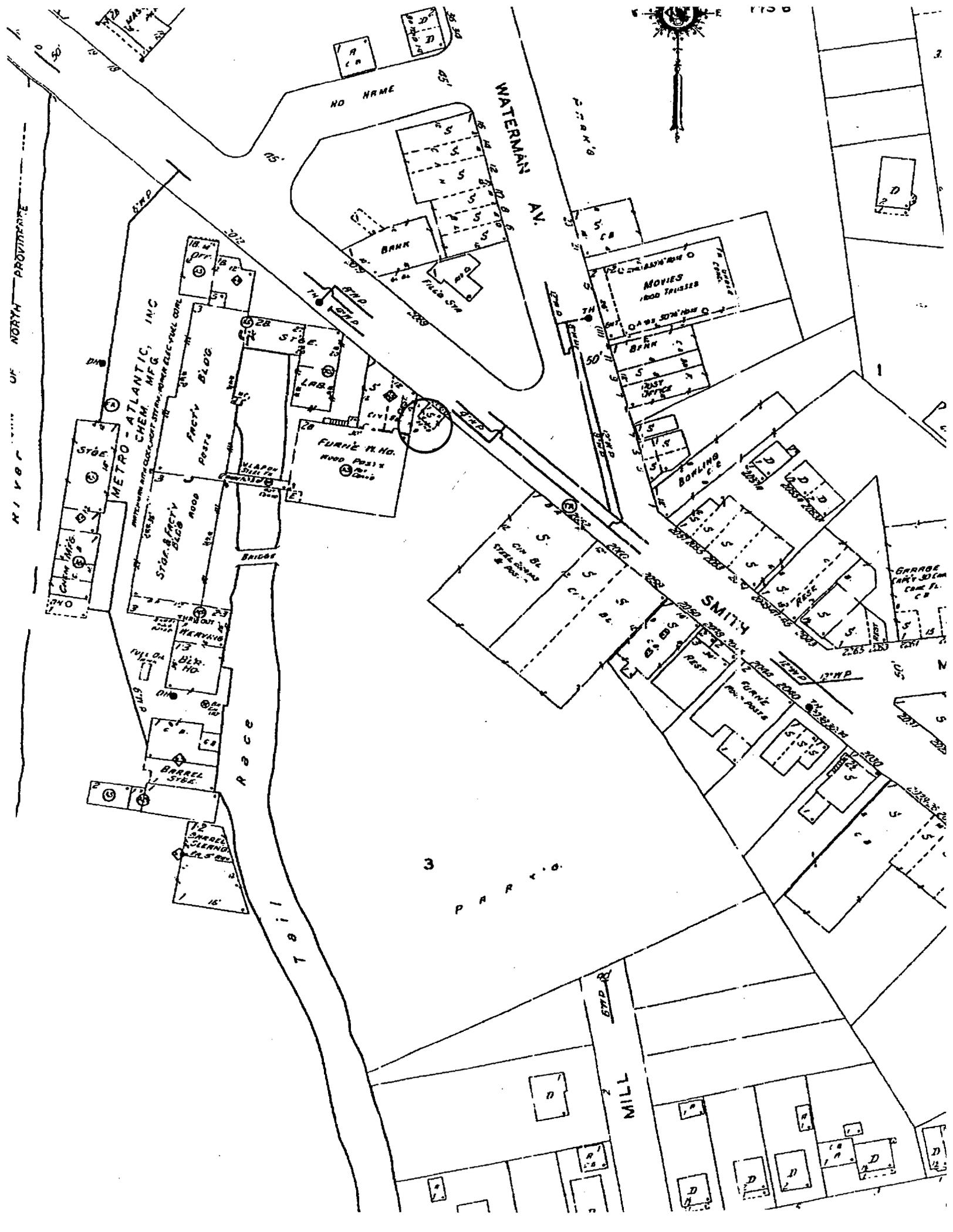
Shop

CENTREDALE NORTH PROVIDENCE

not paid, 5 stations 5 combination
 base and pumping engines 1 hook & ladder
 truck 1 firest fire truck fully motorized
 2500' 25' hose
 kitchen and hot drains located in
 fire stations.

Roofing ordinance.
 All new roofs or replacements of old roofs
 shall be of non-combustible material
 in entire town.
 Ordinance adopted A. 14 G. 1929.
 No fire limits





N 100' OF NORTH AVENUE

NO. NAME

WATERMAIN AV.



METRO-ATLANTIC, INC.
CHEM. MFG.

FURN. H. NO.

SMITH

MILL

ROCK

TAIL

PARKING

N

S

E

W

105'

200'

300'

400'

500'

600'

700'

800'

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

126

127

128

129

130

131

132

133

134

135

136

137

138

139

140

141

142

143

144

145

146

147

148

149

150

151

152

153

154

155

156

157

158

159

160

161

162

163

164

165

166

167

168

169

170

171

172

173

174

175

176

177

178

179

180

181

182

183

184

185

186

187

188

189

190

191

192

193

194

195

196

197

198

199

200

201

202

203

204

205

206

207

208

209

210

211

212

213

214

215

216

217

218

219

220

221

222

223

224

225

226

227

228

229

230

231

232

233

234

235

236

237

238

239

240

241

242

243

244

245

246

247

248

249

250

251

252

253

254

255

256

257

258

259

260

261

262

263

264

265

266

267

268

269

270

271

272

273

274

275

276

277

278

279

280

281

282

283

284

285

286

287

288

289

290

291

292

293

294

295

296

297

298

299

300

301

302

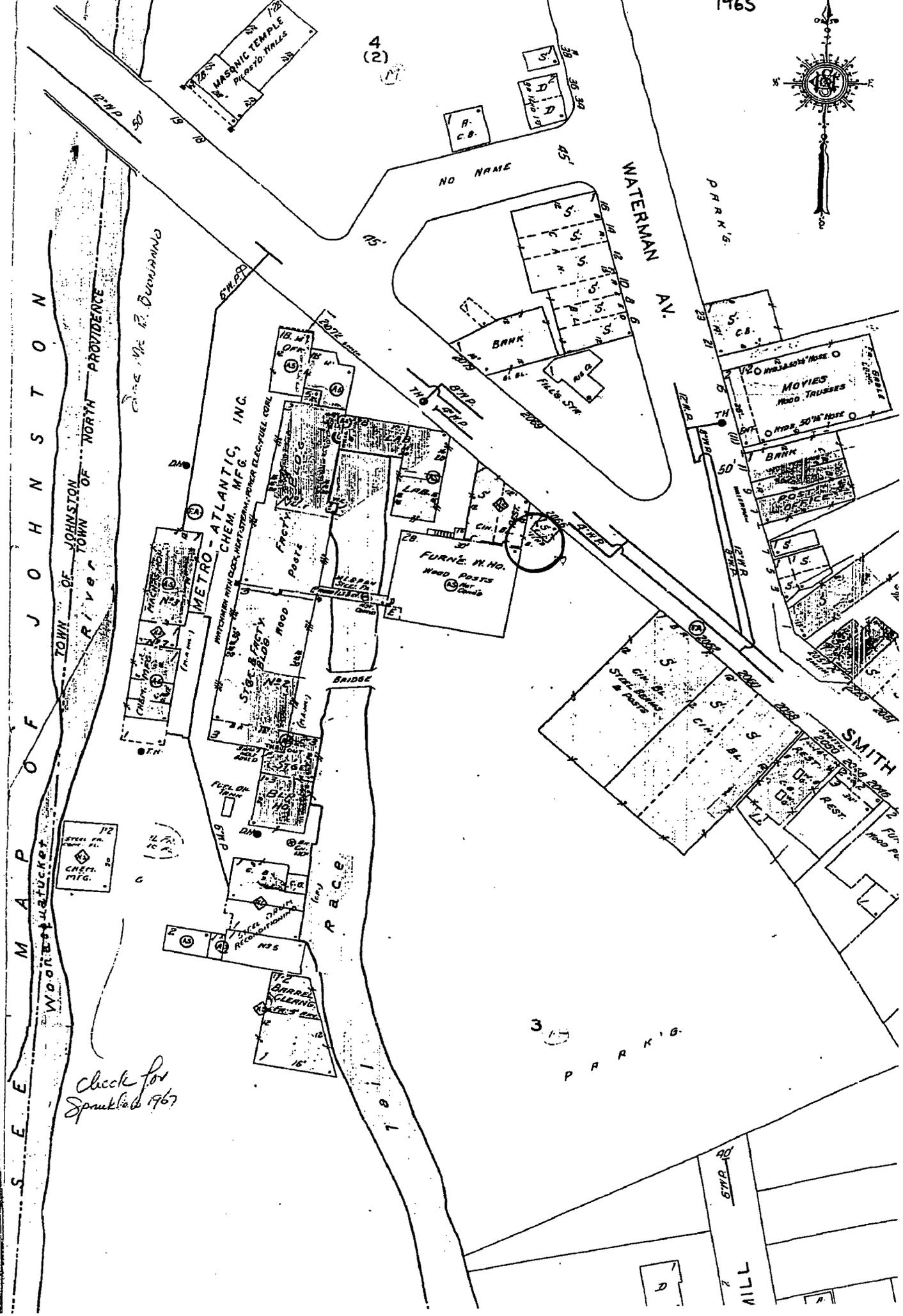
303

304

305

306

307</



S E E M A P O F T O W N O F J O H N S T O N

WOODRUCKER
RIVER
TOWN OF JOHNSTON OF NORTH PROVIDENCE

CHAS. W. P. BURNHAM

METRO - ATLANTIC CHEM. MFG. INC.
MACHINERY WITH CLOCK, MORTAR, SPINNING, POWER ELECTROLYTIC COIL

ST. & FIFTY BLDG.
WOOD

FURN. H. HO.
WOOD POSTS

BANK

WATERMAN AN.

PARK'S

SMITH

P.P.R.K.

Check for Sprinkle 1967

4
(2)

172
STEEL SH.
CREF. MFG.

172
BARREL
CLEANING
EQUIP. CO.

STP RD

MILL

Plat 14, Lot 516
North Providence, Rhode Island
Photographs Taken: April 4, 2002



Plat 14, Lot 516
North Providence, Rhode Island
Photographs Taken: April 4, 2002

