

STATE OF DELAWARE

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL
CONTROL- SITE INVESTIGATION AND RESTORATION BRANCH

FINAL PLAN OF REMEDIAL ACTION



December 2005

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File# DE1299
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Maffett Property
1330 East 12th Street
Wilmington, Delaware

DNREC Project No. DE-1299

This Final Plan of Remedial Action (Final Plan) presents the Department of Natural Resources and Environmental Control's (DNREC's) preferred cleanup alternative for the remediation at the Maffett 12th Street Property (Site). For Site-related reports and more information, please see the public participation section of this document.

The purpose of the Final Plan is to provide specific information about the soil and groundwater contamination and the cleanup alternatives DNREC has considered for the Site. In addition, as described in Section 12 of the Delaware Regulations Governing Hazardous Substance Cleanup (Regulations), DNREC provided notice to the public and an opportunity for the public to comment on the Proposed Plan. No comments or requests for a public hearing on the contents to the Proposed Plan were received by DNREC. All investigations of the site, the Proposed Plan, comments received from the public, DNREC's responses to the comments, and the Final Plan constitute the Remedial Decision Record.

This Final Plan summarizes the 2004 Remedial Investigation (RI) Study that has taken place at the site. This report is included in the administrative record file. Copies of the Site-related documents can be obtained or viewed at the DNREC office at Lukens Drive in New Castle.

INTRODUCTION

The Site consists of 2.03 acres of industrial land, most of which is covered with a 45,000 square foot, steel-framed warehouse, located at 1330 East 12th Street on tax parcel 26-045.00-017 in Wilmington, New Castle County, Delaware (Figure 1). Presently, the Site is covered entirely by the concrete slab-on-grade of the building and pavement, with the exception of a 140 foot by 60 foot area in the southeastern corner of the Site which was covered with crushed concrete as part of an Environmental Protection Agency (EPA) cleanup at the adjoining 12th Street Drum Site (DE-0294).

The Site has been owned by Mr. Sidney Maffett since 1987 whose company, Thermo Plastics, Inc. (TPI), used the Site for injection-molding of plastic parts. Prior to 1987, the Site was vacant and owned by the Wilmington Economic Development Co. (WEDCO) which obtained the Site from the Electric Hose and Rubber Company (EHR). Based on aerial photographs of the Site, it appears that the Site building, parking lot and seawall were constructed sometime between 1954 and 1977.

Mr. Maffett entered into the Department of Natural Resources and Environmental Control - Site Investigation and Restoration Branch's (DNREC-SIRB's) Voluntary Cleanup Program (VCP) under the provisions of the Delaware Hazardous Substances Act (HSCA), 7 Del. C. Chapter 91 in March 2003. Through the VCP Agreement, Mr. Maffett agreed to conduct a remedial investigation (RI) of the Site to identify whether any risks to human health, welfare and the environment are present at the Site and if necessary, to implement a remedy. Mr. Maffett contracted with the environmental consultant Ten Bears Environmental L.L.C. (Ten Bears) to perform the RI.

SITE DESCRIPTION AND HISTORY

The Site is located in a heavily industrialized area along the eastern bank of the Brandywine Creek (Figure 1), with the Electric Hose and Rubber/Brandywine Industrial Complex (a large packaging/warehousing operation) adjoining the property to the northwest, the 12th Street Landfill/Dump Site (a gravel-covered landfill) to the southeast, the AMTRAK maintenance yard across 12th street to the north, and the Howard R. Young Correctional Institution (the former Gander Hill Prison) across 12th street to the northwest. A 2-foot wide concrete seawall/retaining wall, which separates the paved portion of the Site from the Brandywine Creek, forms its southwestern border and a railroad spur passes through an easement along the northern boundary of the Site. The Site was constructed over the former course of Shellpot Creek, which was diverted by construction activities between 1938 and 1954. A City of Wilmington combined sewer is piped through the Site beneath the building. The Site was formerly part of the Electric Hose and Rubber/Brandywine Industrial Complex, which occupied the area to the northwest for at least 50 years. Indications of apparent materials storage, land-disturbing activities, and potential additional filling at the property and surrounding area are visible on aerial photographs dated 1962 and 1968. The current building, associated paved parking area, and railroad spur (See Figure 2) are first visible on the 1977 photograph. Subsequent photographs and maps depict the Site similarly with no changes to the Site after Mr. Maffett's purchase being observed. The building on the Site is currently unoccupied.

INVESTIGATION HISTORY AND RESULTS

Ten Bears completed a RI Report in May 2005. The RI involved the collection of samples from surface soil, subsurface soil, groundwater and sediment. Several contaminants were detected in soil and groundwater above the Delaware Uniform Risk-Based Standard (URS) values for unrestricted or restricted use. A detailed discussion of the sampling results is included in the RI report. The following is a summary of the investigation results.

SOIL

In surface soil (0-2 feet below ground surface), aluminum and iron were detected at concentrations above the DNREC's URS values for unrestricted (residential) use. In subsurface soil (greater than 2 feet below ground surface), arsenic and lead were detected at concentrations which exceeded DNREC's URS for both unrestricted (residential) use and restricted (commercial/industrial) use while aluminum, barium, iron, manganese, vanadium, zinc, and benzo(a)pyrene were detected at concentrations above the DNREC's URS values for unrestricted (residential) use. These potential contaminants of concern (COCs) appear to be related to the placement of fill containing coal-ash/slag at the Site prior to construction of the existing building and pavement and are not the result of releases from activities performed at the Site since then. The following table summarizes the potential COCs found in the Site soils which exceed their respective URS values for unrestricted (residential) and restricted (industrial/commercial) use.

SOIL SAMPLE LABORATORY DATA

	URS for Unrestricted Use, Non-critical Water Resource Area (mg/kg)	URS for Restricted Use, Non- critical Water Resource Area (mg/kg)	Sample GP-1	Sample GP-3	Sample MW-3	Sample GP-6
Depth (feet)			6-9	2-3	5-8	1-2
TAL Metals						
Aluminum	7,800	200,000	21,800	12,500	28,400	17,200
Arsenic	11	11	15.7	1.01 J	8.07	1.68
Barium	550	14,000	1,130	29.6	97.1	36.9
Iron	2,300	61,000	46,700	7,620	36,900	13,400
Lead	400	1,000	7,670	15	37.4	5.49
Manganese	160	4,100	443	163	258	110
Vanadium	55	1,400	61	14.6	59	26.1
Zinc	2,300	61,000	3,400	10.7	121	12.9
TCL Semivolatile Compounds						
Benzo(a)pyrene	0.09	0.8	0.43 J	0.039 J	0.059 J	ND

J = Analyte present. Reported value may not be accurate or precise.

Bold = Exceeds Screening Criteria

GROUNDWATER

Shallow groundwater at the Site was encountered within the fill zone at depths ranging from 2 to 6 feet below ground surface. The fill overlies low permeability silt and clay

which probably represents a marsh deposit. Although arsenic, barium, iron and manganese were detected at concentrations above the URSs for surface water, none of these contaminants exceeded the URS for protection of groundwater for human health. The following table summarizes the potential COCs found in Site groundwater which exceed their respective URS values for protection of human health and the environment.

GROUNDWATER SAMPLE LABORATORY DATA

	URS for Protection of Human Health, Groundwater (mg/L)	URS for Protection of Environment, Surface Water (mg/L)	Default Background Standard* (mg/L)	MW-1	MW-2	MW-3
TAL Metals						
Arsenic	0.05	0.003	0.001	0.0273	ND	ND
Barium	2	0.004	0.004	0.0789	0.059	0.343
Iron	0.3**	1	0.3	ND	ND	13.6
Manganese	0.05**	0.08	0.05	0.0247	0.091	0.73

J = Analyte present. Reported value may not be accurate or precise.

** = Secondary Maximum Contaminant Level

Bold = Exceeds Screening Criteria

SEDIMENT

Nine (9) target analyte list (TAL) metals, two (2) target compound list (TCL) pesticides and twelve (12) TCL semivolatile compounds were detected at concentrations above their respective URS values for sediment. The following table summarizes the potential COCs found in sediment which exceed their respective URS values for protection of the environment.

SEDIMENT SAMPLE LABORATORY DATA

	URS for Protection of the Environment, Sediment (mg/kg)	SED-1 mg/kg	SED-2 mg/kg	SED-3 mg/kg
TAL Metals				
Arsenic	8	42.6	9.53	9.45
Barium	20	347	156	244
Cadmium	1	3.23	0.16 J	1.94
Chromium	81	397	133	68.8
Copper	34	157	51.6	83.4
Lead	47	369	1,270	3,640
Mercury	0.2	1.22	0.263	0.195
Nickel	21	39	23.4	30.7
Zinc	150	1,070	299	596
TCL Pesticides / Polychlorinated Biphenyls (PCBs)				
p,p'-DDE	0.03	0.0015 J	0.0047	0.032
p,p'-DDT	0.002	0.0032 J	ND	ND
TCL Semivolatile Compounds				
Naphthalene	0.4	1.3 J	0.56	0.85 J
Acenaphthene	0.09	ND	0.049 J	0.55 J
Fluorene	0.1	0.31 J	0.068 J	0.42 J

	URS for Protection of the Environment, Sediment (mg/kg)	SED-1 mg/kg	SED-2 mg/kg	SED-3 mg/kg
Phenanthrene	0.5	1.3 J	0.32 J	2.6 J
Anthracene	0.3	0.44 J	0.06 J	0.56 J
Fluoranthene	0.8	2.3 J	0.42 J	4
Pyrene	NL	2.6 J	0.44 J	3.4
Benzo(a)anthracene	0.1	1.3 J	0.17 J	1.9 J
bis (2-ethylhexyl) phthalate	3	ND	ND	4.6
Chrysene	0.9	1.7 J	0.26 J	2.1 J
Benzo(a)pyrene	0.1	1.5 J	0.18 J	1.9 J
Indeno(1,2,3-cd)pyrene	0.8	0.92 J	0.15 J	1.1 J

J = Analyte present. Reported value may not be accurate or precise.

Bold = Exceeds Screening Criteria

SITE RISK EVALUATION

A limited risk assessment was performed to evaluate the possible effects on human health and the environment by the contaminants of concern found at the Site.

Soil

There are no current human exposure pathways to soil at the Site because it is covered with a building, pavement, and crush and run stone over a geotextile fabric. The carcinogenic cumulative risk posed by Site soil to a construction worker during future Site redevelopment was calculated to be 1.46×10^{-5} which exceeds DNREC's acceptable risk level of 1×10^{-5} . Arsenic is the individual compound that contributes all of the carcinogenic risk. The non-carcinogenic hazard index of 0.28 is less than the DNREC limit of 1.0.

Groundwater

There is no risk posed to human health by the consumption of Site groundwater as none of the concentrations of metals detected in groundwater exceeded the URS values. In addition, the Site lies within the City of Wilmington Groundwater Management Zone (GMZ) and is also regulated by City of Wilmington municipal law, both of which prohibit the installation of water wells and the consumption of groundwater within the City limits.

Groundwater to Surface Water Impact: Mass loading screening calculations indicated that the discharge of shallow groundwater to the Brandywine Creek does not result in any exceedances of the current DNREC Surface Water Quality Standards and therefore does not pose a risk to surface water receptors in the area.

Sediment: Arsenic and barium were the only two (2) metals out of the nine (9) detected in sediment that were also found in soil and groundwater at the Site at concentrations which exceeded their respective URS values. Benzo(a)pyrene was the only SVOC out of

the twelve (12) found in sediment that was also found in soil at the Site at concentrations which exceeded their respective URS values. Although Pesticides/PCBs were found in the sediment samples, they were not found in either soil or groundwater samples from the Site.

Although several of the COCs found in the sediment samples were also found in the soil and groundwater samples at the Site during this investigation, the sediment samples results did not indicate a strong relationship between the between the COCs found in Site soil and groundwater under the current Site conditions.

REMEDIAL ACTION OBJECTIVES

According to Section 8.4(1) of the HSCA Regulations, site-specific remedial action objectives (RAOs) must be established for all plans of remedial action. The Regulations provide that DNREC will set objectives for land use, resource use, and cleanup levels that are protective of human health and the environment. The following qualitative objectives have been determined to be appropriate for the Site:

- Prevent human exposure (dermal, inhalation and ingestion) to impacted soil under future restricted land use;
- Prevent the use of groundwater for all purposes at the Site;
- Minimize potential exposure to Site contaminants of concern to impacted soil for construction workers during future Site redevelopment; and
- Prevent environmental impacts, specifically to the Brandywine Creek, due to impacted media at the Site.

These objectives are consistent with the current use of the Site and its industrial setting, New Castle County zoning policies, state regulations governing water supply, and worker health and safety.

Based on the above qualitative remedial action objectives, the quantitative remedial action objectives based on a restricted Site use are proposed:

1. Prevent human exposure to soil contaminated with lead and arsenic that would result in a cumulative carcinogenic risk factor greater than 1×10^{-5} and a non-carcinogenic risk greater than Hazard Index of 1.0.
2. Prevent contact with groundwater, the future use of groundwater for drinking water purposes, and the installation of drinking water wells;
3. Prevent the discharge of any contaminants from the Site into the Brandywine Creek that would cause surface water or sediment concentrations in the creek to exceed Delaware Surface Water Quality Standards.

FINAL PLAN OF REMEDIAL ACTION

The Site is currently developed as a commercial building and parking lot and is expected to remain under the same land use for the foreseeable future. The Final Plan for the Site calls for continued maintenance of the existing capping and containment system (building, parking lot, hardscaped areas and seawall) and institutional controls.

Based on DNREC's evaluation of the Site information, which includes current and past environmental investigations, historical information, the limited contamination present at the Site, and the above remedial action objectives, DNREC final remedy for the Site includes the following actions:

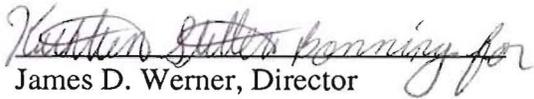
1. Placement of an environmental covenant on the Site, consistent with Delaware's Uniform Environmental Covenants Act (UECA), within ninety (90) days following DNREC's adoption of the final plan;
2. A DNREC-approved Operations and Maintenance (O & M) Plan will be established by the Site owner and implemented within ninety (90) days following DNREC's adoption of the final plan. The O & M plan will detail the procedures and practices including regular inspections to minimize the potential for disturbing the cap and containment system and to promote the long term integrity of the system. The Site will also be incorporated into DNREC's Long-Term Site Stewardship program as it develops;
3. Limit the property to non-residential uses that would maintain the degree of surface cover comparable with current conditions;
4. Prohibit any demolition of the building and seawall or land-disturbing activities that requires excavation in the footprint of the building, of the seawall, and of the paved and covered areas on the property without the prior written approval of DNREC;
5. Prohibit the installation of any water well on, or use of groundwater at, the site without the prior written approval of DNREC; and
6. Identify the site as being located within the GMZ, which is already in place for the City of Wilmington (August 2001). The site is located within the City of Wilmington boundary limits. The GMZ will prohibit the installation of any water wells on, or groundwater usage at the site without prior written approval of DNREC. In addition, the City prohibits drinking water wells to be installed within the City limits.

PUBLIC PARTICIPATION

The Department actively solicited written public comments and suggestions on the Proposed Plan of Remedial Action. The comment period began November 7, 2005, and ended at the close of business (4:30 p.m.) November 28, 2005.

DECLARATION

This Final Plan of Remedial Action for the Maffett 12th Street Property is protective of human health, welfare and the environment and is consistent with the requirements of the Delaware Hazardous Substance Cleanup Act.

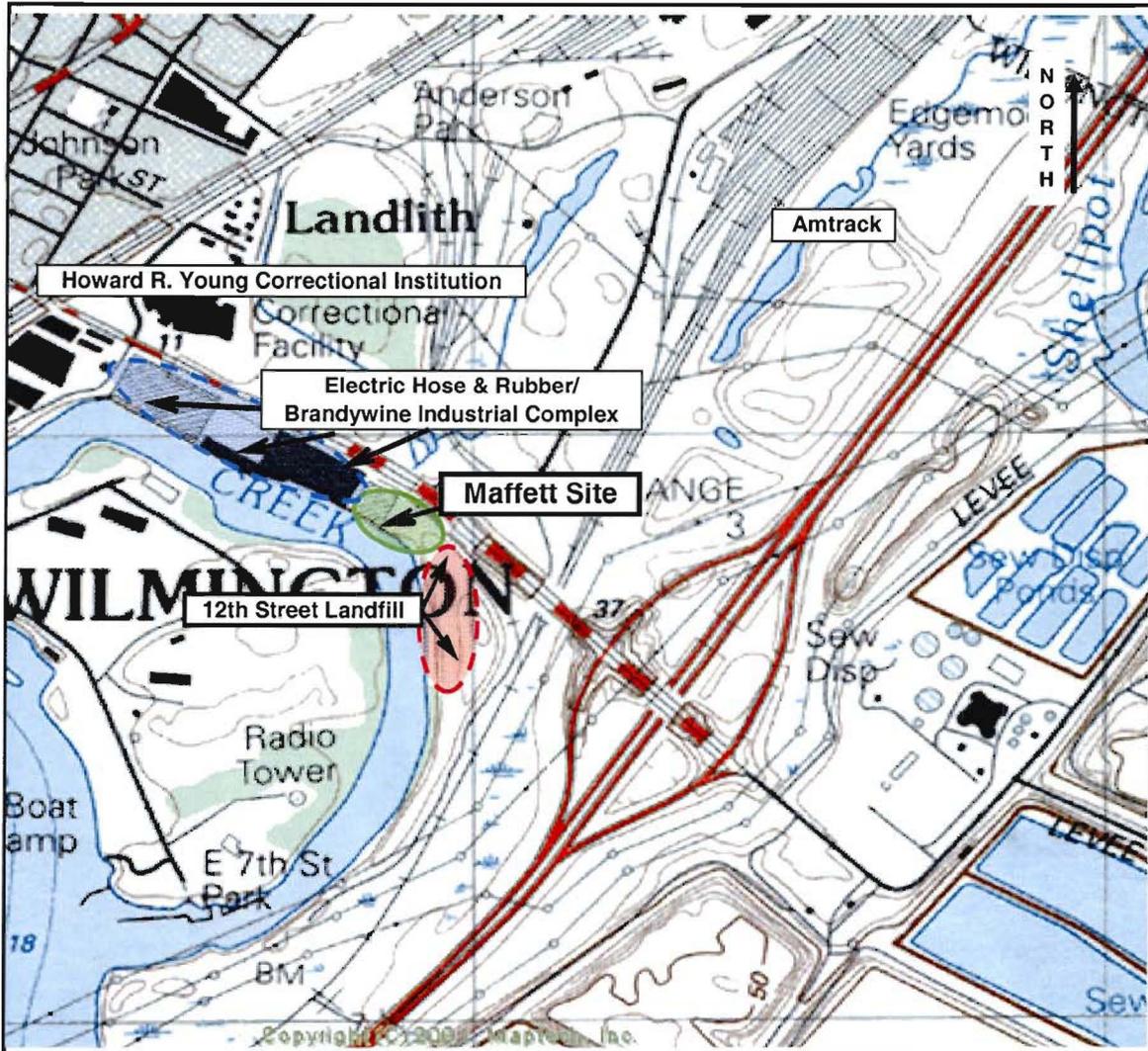

James D. Werner, Director
Division of Air and Waste



Date of Review

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Figure 1: Site Location Map



This location sketch was adapted from the USGS Topographic Maps, 7.5 Minute Series for Wilmington South, Delaware (1993)

 Ten Bears Environmental Ten Bears Environmental, L.L.C. P.O. Box 9711 Newark, DE 19714-9711 Phone: (302) 731-8633 Fax: (302) 731-8655	FIGURE 1 - SITE LOCATION SKETCH MAFFETT 12TH STREET SITE <small>1330 12TH STREET</small> CITY OF WILMINGTON, DELAWARE	
	DATE: 9/23/2003 (Revised 12-5-03) DRAWN BY: RCG CHECKED BY: FILE NO: 03124A-1.FIG	JOB NUMBER: 03-124.A SCALE: 1" : 900' ± FIGURE NO: 1 SHEET 1 OF 1

Figure 2: Sample Location Map

