

**STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL
CONTROL SITE INVESTIGATION AND RESTORATION BRANCH**

SOIL FINAL PLAN OF REMEDIAL ACTION



March 2007

**Georgetown Coal Gas Site
Soil Contamination Only
Georgetown, Delaware**

DNREC Project No. DE-0188

This Final Plan of Remedial Action Plan (Final Plan) presents the Department of Natural Resources and Environmental Control's (DNREC's) preferred cleanup alternative for the soils remediation at the Georgetown Coal Gas Site in Georgetown, Delaware. 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: 1) specific information about the soil contamination present at the Site and 2) the cleanup alternatives DNREC has considered for the soil contamination, and 3) the selected remedial actions for the Site. A separate proposed plan will be developed for the groundwater contamination present at the Site and the adjoining sites. In addition, as described in Section 12 of the Delaware Hazardous Substance Cleanup Act (HSCA), DNREC provided notice to the public and an opportunity for the public to comment on the proposed plan. During the comment period from February 28 to March 20, 2007, DNREC did not receive any comment on the proposed plan; therefore, the proposed plan has been adopted as the Final Plan.

This Final Plan summarizes the July 1996 Remedial Investigation Report, February 1998 Phase II Remedial Investigation Report, July 2001 Soil Removal Interim Action Report and Quarterly/Semi-Annual Groundwater Monitoring Reports from July 2001 through July 2005, and the administrative record file upon which this Final Plan is based. Copies of these documents can be obtained or viewed at locations listed at the end of this document.

INTRODUCTION

The Georgetown Coal Gas Site occupies approximately 0.5 acres, and is located on North Race Street, between Pepper Street and New Street in a commercial northern section of Georgetown, Delaware (Figure 1). The site encompasses tax parcels 1-35-14.20-117 and 1-35-14.20-118 on the tax maps for Sussex County. The Georgetown Coal Gas Site is currently owned by the J.G. Townsend Company (Townsend).

Gas-Oil Products, Inc. of Delaware (GOP), a Subsidiary of PPL Gas Utilities Corporation, was the previous owner and is identified as a potentially responsible party (PRP). GOP entered into the Voluntary Cleanup Program (VCP) for the Site under the provisions of the Delaware Substance Cleanup Act (HSCA), 7 Del. C. Chapter 91 in February 1996 to conduct a remedial investigation (RI)/Feasibility Study (FS) of the Site. Investigations and removal actions have been completed by numerous HSCA certified environmental consultants.

SITE DESCRIPTION AND HISTORY

The site is currently a vacant lot, fenced with a gate, and covered with gravel (Figure 2). JG Townsend Site (DE-0188) is located to the north and northeast of the Site. A Conrail Railroad track and undeveloped land is located to the east of the Site. A vacant building is located to the south of the Site. Pep-Up, Inc., located to the west of the Site, operated a former fuel storage and distribution center. Georgetown Cleaners (DE-0113) is located further to the west across North Race Street. Residences and commercial buildings are located west and northwest of the Site across North Race Street. The closest water body to the Site is Savannah Ditch which is located approximately ½ mile to the northeast of the Site.

The Site is a former manufactured gas plant (MGP) site. The Georgetown Coal Gas Plant utilized a water gas/carbureted water gas process to manufacture gas. The Georgetown Coal Gas Plant was active for a relatively short period from approximately 1910 to 1930. At various times during the operation, the following structures were present at the site: two cylindrical gas holders, coal bins, a tar tank, and a main building consisting of three gas generators and a purifying room. GOP bought the Georgetown Coal Gas Plant after 1930.

Townsend Frozen Food company plans to construct a cold storage structure over the Georgetown Coal Gas Site for an operations expansion.

SITE INVESTIGATION HISTORY

Numerous soil investigations and an interim action were conducted at the Site including a July 1996 remedial investigation (RI) by Fluor Daniel GTI, Inc.; February 1998 Phase II RI by ThermoRetec Consulting Corporation (aka The RETEC Group (RETEC)) and July 2001 Soil Removal Interim Action Report by RETEC for post remediation sampling documentation. These investigations included surface and subsurface soil samples as well as groundwater samples. Groundwater sampling began in July 2001 and is currently ongoing.

The various investigations showed impacts to the soil and groundwater from former MGP operations. An interim remedial action (aka. interim remedial measure) was conducted in 2001 to remove all surface soil down to two feet and remove unsaturated impacted soil from (2) two

feet below ground surface (bgs) to the groundwater table (Figure 3). Prior to the soil removal, all aboveground structures were removed. A subsurface concrete gas holder pad is the only remaining structure. The concrete pad is approximately 1.5 feet below the ground surface.

Several contaminants were detected in surface soil, subsurface soil and groundwater above Delaware’s restricted use Uniform Risk-Based Standard (URS) values. A detailed discussion of the sampling results is included in the RI reports. The following is a summary of the investigation results.

INVESTIGATION RESULTS

SURFACE SOIL

In surface soils (0 to 2 feet below ground surface (bgs)), polynuclear aromatic hydrocarbons (PAHs) were detected above DNREC’s Uniform Risk-Based Remediation Standards (URS) for restricted use (commercial) in a critical water resource area. Contaminants that exceeded the URS in the surface soil at the Site are shown in the Table 1. However, as mentioned above there was an interim soil removal where all the surface soil was removed and replaced with crush and run gravel. As a result, the surface soil contamination no longer exists.

Table 1: Surface Soil Contamination Before Removal (0-2 feet bgs)

Contaminant	Reasonable Maximum Exposure Concentration* (mg/Kg)	URS for restricted use (mg/kg)
Organics		
PAHs		
Naphthalene	18.926	5.0
Benzo(a)anthracene	8.820	0.9
Benzo(b)flouranthene	13.915	0.9
Benzo(a)pyrene	9.534	0.09
Indeno(1,2,3-cd)pyrene	9.003	0.9
Dibenz(a,h)anthracene	2.033	0.09

* RME- Reasonable Maximum Exposure Concentration calculated as the 95% Upper Confidence Level (UCL) of the arithmetic mean of concentrations of contaminants detected at the site. RME values calculated using EPA Pro-UCL Software (USEPA, 2004).

Mg/kg- milligrams per kilogram

SUBSURFACE SOIL

In subsurface soil (greater than 2 feet bgs), PAHs were detected above DNREC’s URS for restricted use (commercial) in a critical water resource area. However, as mentioned above there was an interim soil removal where subsurface soil that was above the standard was removed.

After the removal, PAHs were detected above DNREC’s URS for restricted use in a critical water resource area at one location at a depth of 8-10 feet bgs adjacent to the small subsurface concrete pad. The concrete pad is located near the southwest corner of the Site. Based on this information, a small amount of contamination may exist beneath this pad. With the exception of

the area under the concrete pad and one sampling location, the subsurface soil contamination no longer exists.

Contaminants exceeded the URS in the subsurface soil at only one location at the Site (after the interim action) and are shown in Table 2.

Table 2: Subsurface Soil Results (more than 2 feet bgs)

Contaminant	Maximum Concentration (mg/kg)	URS for restricted use (mg/kg)
Organics		
PAHs		
Naphthalene	54.9	5.0
Benzo(a)pyrene	6.17	0.8
2-Methylnaphthalene	50.4	1
Dibenzofuran	0.86	0.2

GROUNDWATER

Groundwater at the Site and the adjacent area will be addressed under a separate proposed plan. However, a short description of the groundwater contamination at the Site is presented below.

Groundwater samples have been collected from the six monitoring wells at the site, and the two Townsend industrial wells (Process and Pre-Pack Wells) on a quarterly and semi-annual basis since July 2001. The six wells monitor shallow, intermediate and deep groundwater for vertical migration in the same aquifer. Groundwater is generally encountered at 8 to 11 feet bgs.

Groundwater flow at the Site is significantly affected by the JG Townsend wells. When the wells are pumping (May – November), groundwater flow in the shallow and deep monitoring wells is in a westerly direction (toward the pumping wells). When the pumping wells are not operating, groundwater flow in the shallow wells is to the east-northeast and in the deep wells to the north-northeast. The average flow at the Site is to the west (toward the pumping wells).

Shallow Groundwater Results

Benzene, naphthalene, and fluorene were detected above the URS in the shallow wells (screened 5 to 15 feet bgs) at the Site.

Intermediate Groundwater Results

Tetrachloroethene (PCE) and trichloroethene (TCE) were detected above the URS in the intermediate groundwater wells (screened 30-40 feet bgs). This contamination may have migrated from an offsite source, most likely from Georgetown Cleaners.

Deep Groundwater Results

No contaminants exceeded URS standards for groundwater in the deep well (screened 70-80 feet bgs) located at the Site.

DNREC sampled the JG Townsend Process well screened deeper in the aquifer and determined that it had been impacted by benzene and tetrachloroethane (PCE) from offsite sources. The Delaware Department of Public Health restricted J.G. Townsend from using the well as a drinking water source. The groundwater for Georgetown Cleaners, Georgetown Coal Gas and JG Townsend are being addressed under a separate operable unit. It is anticipated that this will include treatment of the JG Townsend Process well to return it to use as a drinking water well.

SITE RISK EVALUATION

A risk assessment was performed to identify the potential effects to human health and the environment by the contaminants of concern at the Site.

Surface soil contamination at the Site was removed during interim actions and replaced with clean fill. Since the soil was removed, there is no risk to human health or the environment from surface soils. Subsurface soil samples collected adjacent to the pad contained PAHs above the URS levels. However, the risk of human exposure to the soil under the pad is low since the pad is acting as a barrier cap. As long as the pad remains in place, the risk of human contact with this soil will remain low.

Groundwater, as described above, will be addressed as a separate operable unit.

DNREC assessed the risk of vapor intrusion from groundwater for the new building to be built on the Site. The cumulative carcinogenic risk to humans posed by VOCs from groundwater to the indoor air would be 9.98×10^{-7} and a hazard index of 0.34. These are below DNREC acceptable risk level of 1×10^{-5} and 1.0.

INTERIM RESPONSE REMOVAL ACTIVITIES

The objectives for the interim action were (1) safely remove all surface and subsurface soil that was greater than moderately impacted as defined in the IRM Work Plan, and (2) remove all surface soil except immediately adjacent to monitoring well cluster MW-8/8I/8D. This soil was judged to be necessary to support the wells. The wells were necessary for the monitoring of groundwater quality as groundwater migrated from the site toward the JG Townsend Process well. Since excavation activities would be conducted very close to the J. G. Townsend warehouse, a barrier wall was constructed around the excavation area for soil stability and foundation support. The barrier wall encompassed all subsurface soil for excavation.

Upon completion of the soil removal interim action, surface and subsurface soil was sampled and all contaminants were below URS standards. The exception was one subsurface soil sample adjacent to the subsurface concrete pad and beneath the concrete pad. Samples below the pad could not be collected due to the pad thickness. The level of contamination under the pad is unknown. The interim action was completed from March 2001 through April 2001 including:

- Excavation and disposal of all surface soil, except around well cluster MW-8/8I/8D.

- Installation of a permanent barrier wall.
- Excavation and disposal of the subsurface soil within the barrier wall.
- Removal and disposal of an on-grade concrete gas holder pad, and other miscellaneous subsurface structures and pipes.
- Abandonment of monitoring wells and reinstallation of new monitoring wells MW-4, removal of monitoring wells MW-2 and MW-3, and installation of new monitoring wells, MW-9, MW-10 and MW-11.
- Site restoration with crush and run.
- 5,554 tons of impacted soil, 126 tons of construction and demolition debris, and approximately 26,000 gallons of water were transported offsite for disposal.

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 remedial action objectives are established for the Site:

Qualitative Objectives

- Protect construction workers who may remove the subsurface concrete pad or adjacent to the pad for a utility corridor from coming into contact with the contaminated subsurface soil during the proposed construction activities. Based on soil contamination observed at the Site (Table 2), any contamination under the pad which may be present is anticipated to consist of PAHs.
- Limit the future use of the Site to restricted use (commercial).

Quantitative Objectives

- Prevent human exposure to subsurface soils, adjacent and located under the subsurface concrete pad at the Site, contaminated with PAHs having a cumulative carcinogenic risk factor greater than 1×10^{-5} and/or a hazard index of 1.

FINAL PLAN OF REMEDIAL ACTION

Based on DNREC's evaluation of the site information, which includes current and past environmental investigations, historical information, the above remedial action objectives, and the remedial alternatives evaluated in the remedial alternatives evaluation, DNREC requires the following remedial actions be taken at the Site:

1. If the subslab concrete pad needs to be removed for utilities or the soil adjacent to the concrete pad at a depth of 8 ft bgs or deeper is to be disturbed, the work will be done in

accordance with a Site-specific Health and Safety Plan (HASP) and a DNREC-approved Site-specific Contaminated Material Management Plan (CMMP), which results in removal and proper disposal of excavated contaminated soil and groundwater, if encountered. Utility corridors in this area will be lined with marker fabric and piping construction must be reviewed and approved by DNREC. The CMMP will also identify the barrier wall which was installed for the interim action.


2. Any land disturbing activities below 12 inches depth will be prohibited, including but limited to digging, drilling, construction, earth moving or any other land disturbing activity without DNREC's prior written approval.
3. The Site use will be restricted to commercial use by the owner by the placement of an environmental covenant consistent with Delaware's Uniform Environmental Covenant Act (UECA). Any future development of the parcels will be limited to commercial development. The environmental covenant will also note the CMMP requirements and the restriction against land disturbance without prior DNREC approval.
4. Current and future owners of the property will be responsible for implementation of all aspects and costs of item #1 and item #2 of the approved remedy. The PRP for the Site will be responsible for implementation of all aspects and costs of items #3 of the Final Plan, and adherence to the requirements and conditions established in the environmental covenant for the Site.

PUBLIC PARTICIPATION

The Department actively solicited written public comments and suggestions on the Proposed Plan of Remedial Action. The comment period began on February 28, 2007 and ended on March 20, 2007. No comments were received. If you have any questions or concerns regarding the Georgetown Coal Gas site, or if you would like to view reports or other information regarding the site, please contact the project manager, Rick Galloway at 391 Lukens Drive, New Castle, Delaware 19720, or at 302.395.2600.

DECLARATION

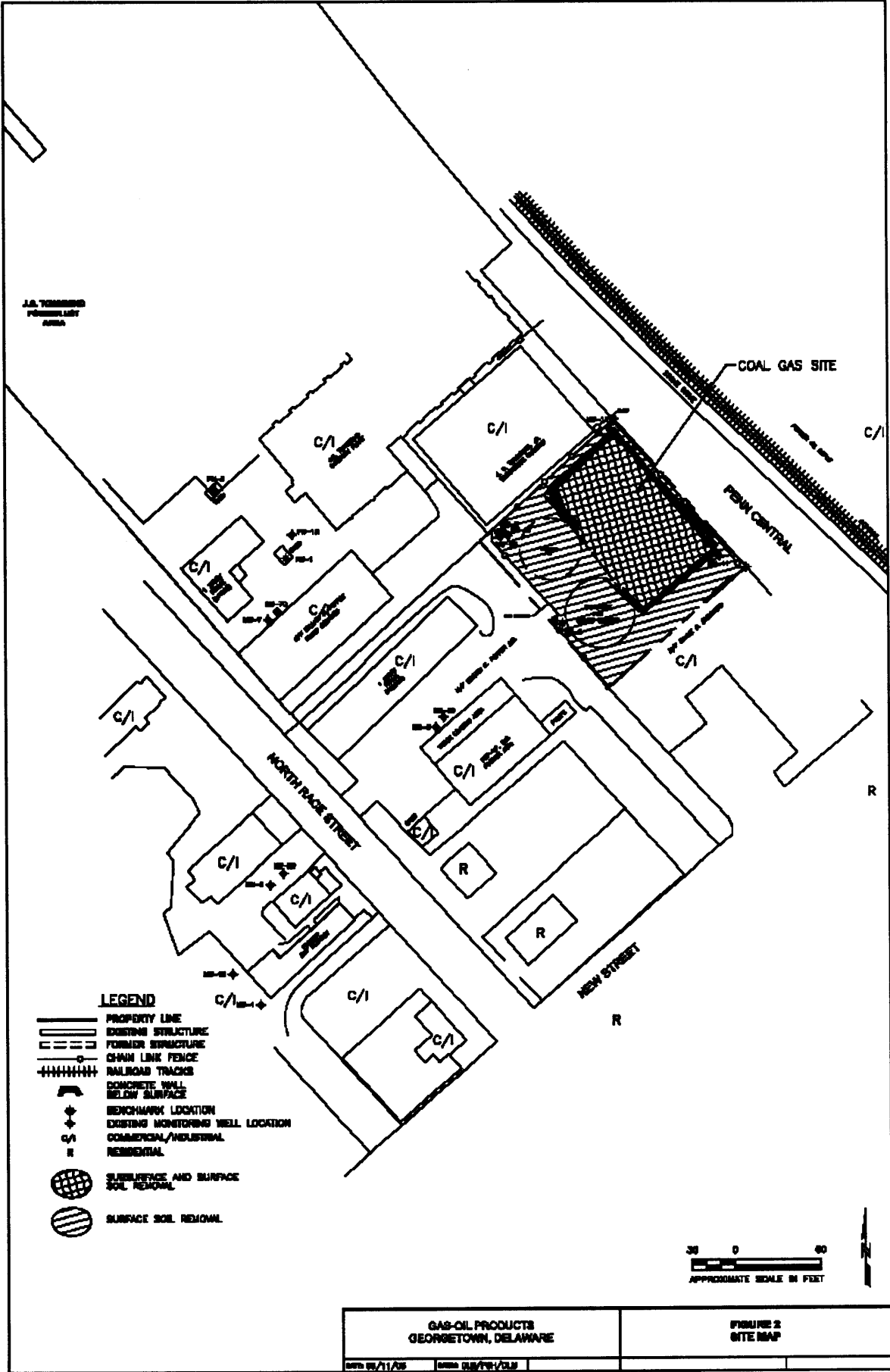
The Final Plan of Remedial Action for the Georgetown Coal Gas site is protective of human health, welfare and the environment, and is consistent with the requirements of the Delaware Hazardous Substance Cleanup Act.


James Werner, Director,
Division of Air and Waste Management

3/29/07
Date

FIGURES

Georgetown Coal Gas
Soil Final Plan of Remedial Action



GAS-OIL PRODUCTS GEORGETOWN, DELAWARE		FIGURE 2 SITE MAP	
DATE 05/11/05	DRAWN DATE/CLM		