

STATE OF DELAWARE

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

FINAL PLAN OF REMEDIAL ACTION



SCANNED
OCT 12 2004
File# DE 1046
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September 2004

**Wilmington Coal Gas Site – Northern Parcel/OU-01
Wilmington, Delaware**

DNREC Project No. DE-1046

This final plan of remedial action (final plan) presents the Department of Natural Resources and Environmental Control's (DNREC's) selected cleanup alternative for the remediation at the Wilmington Coal Gas Site – Northern Parcel/Operable Unit No. 1 (WCGS-N/OU-01) located near the Riverfront area in Wilmington, Delaware.

The purpose of the final plan is to provide specific information about soil contamination and the selected cleanup alternative for the site. In addition, as described in Section 12 of the Delaware Regulations Governing Hazardous Substance Cleanup (Regulations), DNREC has provided notice to the public and an opportunity for the public to comment on the proposed plan. At the conclusion of the public comment period, there were no comments received on the proposed plan of remedial action. The final plan designates the selected remedy for the site. All investigations of the site, the proposed plan, and the final plan will constitute the Remedial Decision Record.

This final plan summarizes the Remedial Investigation/Focused Feasibility Study (RI/FFS), dated July 2004, and the administrative record file upon which this final plan is based. Copies of the site-related documents can be obtained or viewed at locations listed at the end of this document.

INTRODUCTION

Delmarva Power & Light Company (Delmarva), a direct subsidiary of Conectiv and an indirect subsidiary of Pepco Holdings, Inc., has owned portions of the WCGS-N site since the early 1900s, and currently utilizes the property as a maintenance and storage facility for natural gas distribution services for the City of Wilmington and the surrounding communities. The site is located at the intersection of South Madison Street and Beech Streets in Wilmington, Delaware (see attached site location map – Figure 1) and consists of approximately 8.3 acres. The site is labeled as tax parcel number 26-042.00-003 on the tax maps for New Castle County, Delaware.

The RI results indicated that the site has six (6) primary areas of contamination and soil impacts include the presence of manufactured gas plant waste materials (coal tar) and petroleum hydrocarbons. Off-site migration of site contaminants has been identified on the eastern side of South Madison Street on two (2) adjacent properties known as the Madison Conference Center and Brandywine Counseling. For the purposes of this submittal, the WCGS-N site has been subdivided into two (2) operable units (WCGS-N/ OU-01 [Onsite], and WCGS-N/ OU-02 [Offsite]) for future management. This document addresses the remedy selected for WCGS-N/ OU-01 and also discusses WCGS-N/ OU-02 in general terms. A separate, stand-alone proposed plan of remedial action for WCGS-N/ OU-02 will be submitted at a later date, following further evaluation of OU-02.

SITE DESCRIPTION AND HISTORY

WCGS-N is located in the City of Wilmington, New Castle County, Delaware. The site is bordered to the west by Norfolk Southern Railway and an elevated portion of Route I-95, the Wilmington Coal Gas Site – Southern Parcel (WCGS-S) to the south, and industrial businesses and the Wilmington Public Works Yard to the east and north. WCGS-N is approximately 8.3 acres in size and is enclosed with security fencing and gates. At the present time, the site is occupied by Delmarva and consists of a welding shop, training building, vehicle maintenance building, and materials storage area.

INVESTIGATION AND RESULTS

Several site investigations have been conducted at WCGS-N prior to the final Focused Feasibility Study (FFS), including:

- Preliminary Investigation from October 1986 through January 1987;
- The City of Wilmington investigation on the Shipley Run/Clements Run Combined Sewer Outfall (CSO) in 1994;
- The City of Wilmington Investigation of Surface and Subsurface Soils and Groundwater at CSO #30 in December 1998;
- Delaware Department of Transportation (DelDOT) Investigation of Surface and Subsurface Soils of West Street Connector Extension in August 1999;
- Remedial Investigation (RI) from April through June 1997, Draft RI Report finalized in April 2001;
- DelDOT Pole Barn Investigation in May 2001;
- WCGS-N Site Data Summary Report in August 2001;

- Supplemental Remedial Investigation (SRI) in March 2002;
- Area 3 Non-Aqueous Phase Liquid (NAPL) Delineation in May 2002;
- Supplemental Groundwater Investigation (SGI) in October 2002;
- Pathway Exposure Analysis (PEA) in February 2003; and
- Report of Supplemental Data Acquisition (SDA) in May 2004.

Based on the RI, SRI, SGI, and SDA results, the nature and extent of surface and subsurface soil contamination has been determined to be as follows:

Surface Soil Impacts

Arsenic was detected above the 4 milligrams per kilogram (mg/kg) Delaware Uniform Risk-Based Remediation Standards (URS) for Non-Critical Water Resource Area Restricted Use for Surface Soil. Arsenic detected in surface samples collected during the SRI was similar to off-site samples collected for the West Street Connection Investigation. This comparison and the on-site distribution suggest that arsenic on WCGS-N is the result of historical operations conducted in the Wilmington area and not from Manufactured Gas Plant (MGP) operations. DNREC has adopted a default background guidance value of 11 mg/kg for background levels of arsenic in soils in the general vicinity of the site. Statistical analysis of the results from the twenty-seven (27) soil samples collected during the RI and SRI indicates that the mean arsenic concentration in soil samples (excluding one outlier B-43, 84.60 mg/kg) is 6.71 mg/kg with a 95% upper confidence level (UCL) of 9.52 mg/kg. Both of these values are below the guidance value of 11 mg/kg recently implemented by DNREC, indicating no additional measures are required to address this contaminant.

Subsurface Soil Impacts

Polynuclear aromatic hydrocarbons (PAHs), arsenic, and iron were detected above their respective Delaware Non-Critical Water Resource Area Restricted Use URS values for Subsurface Soil. The following table contains a summary of soil analytical data from surface and subsurface samples including metals and PAHs, the uniform risk-based standards (URS) values for the analytes, and mean concentrations of the analytes that exceeded their URS values.

Data Summary Surface and Subsurface Soil Data

| Analyte | Delaware Uniform Risk Based Remediation Standards--Non-Critical Water Resources Area (mg/Kg) | Approximate Mean Concentration (mg/Kg) | Maximum Detected Concentration (mg/Kg) | Location of Maximum Concentration |
|-------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------|-----------------------------------|
| Arsenic | 4 | 8.83 | 84.6 | B-43, 0-0.5 ft. |
| Iron | 61,000 | 26,437 | 88,100 | B-46, 6.5-7.0 ft. |
| Benzo[a]anthracene | 8 mg/Kg | 10.02 | 250 | B-43, 9-10 ft. |
| Benzo[a]pyrene | 0.8 mg/Kg | 9.08 | 140 | B-43, 9-10 ft. |
| Benzo[b]fluoranthene | 8 mg/Kg | 9.52 | 140 | B-43, 9-10 ft. |
| Dibenz[a,h]anthracene | 0.8 mg/Kg | 1.54 | 26 | B-43, 9-10 ft. |
| indeno[1,2,3-cd]pyrene | 8 mg/Kg | 3.01 | 39 | B-43, 9-10 ft. |

Non-Aqueous Phase Liquid (NAPL) Areas

During the SRI investigation, NAPL was identified in several subsurface soil borings. WCGS-N was divided into six (6) NAPL Areas, according to the results of the boring samples collected. Typically, NAPL was detected in areas ranging from 3 to 9 feet below ground surface (bgs).

NAPL – Area 1 is located in the southwest corner of WCGS-N. This area contains an oil-like material that is approximately 1.5 to 5.6 feet thick and located 3 to 7 feet bgs. In addition, NAPL has been detected in a groundwater monitoring well in this area.

NAPL – Area 2 is located in the west central portion of WCGS-N. This NAPL is a tar-like material. Approximately 0.5 feet of NAPL-impacted soil was identified in soil boring B-38, at a depth of 8 to 8.5 feet bgs. NAPL has not been detected in the groundwater monitoring wells in this area.

NAPL – Area 3 is located along the southeastern portion of WCGS-N. This NAPL is an oil-like material. Approximately 1.0 to 4.0 feet of NAPL-impacted soil was identified in this area, at depths ranging from 3 to 9 feet bgs. In addition, NAPL has been detected in the one (1) on-site WIK groundwater monitoring well in this area, most recently 0.01 feet in March 2004. Based on historical use of coal tar equipment in this portion of the site (i.e., relief holders, drip wells, etc.) and the depth of NAPL-impacted soil, it appears that this NAPL could potentially be coal tar related.

Test borings completed off-site, east of South Madison Street, identify a much lighter degree of impact as evidenced by soil staining rather than soil saturation. NAPL - Area 3 progressively grades to an area of stained soil located approximately 8-11 feet bgs extending east from South Madison Street and terminating at a point beneath the adjacent Madison Conference Center (Madison Property) and Brandywine Counseling properties. Historically, lumberyard operations were located on the Madison and Brandywine properties, which had the potential for PAH impacts (creosote). Based on the observed differences in the degree and nature of soil impact throughout this area, offsite WCGS-N/ OU-02 will be managed accordingly under a separate proposed plan of remedial action.

NAPL – Area 4 is located within the material storage yard. This NAPL is an oil-like material. Approximately 0.5 to 3.1 feet of NAPL-impacted soil was identified at depths ranging 3 to 9 feet bgs. NAPL has not been detected in groundwater monitoring wells in this area.

NAPL – Area 5 is located in the southern portion of WCGS-N. This NAPL is a tar-like material. Approximately 1.2 to 5.6 feet of NAPL-impacted soil was identified at depths ranging from 3 to 9 feet bgs. NAPL has not been detected in groundwater monitoring wells in this area.

NAPL – Area 6 is located northwest of the material storage yard. This NAPL is a tar-like material. Approximately 0.5 feet of NAPL-impacted soil was identified in soil boring B-41 at a depth of 0.0 to 2.5 feet bgs. NAPL has not been detected in groundwater monitoring wells in this area.

REMEDIAL ACTION OBJECTIVES

According to HSCA Regulation 8.4(1), remedial action objectives (RAOs) must be established for all Plans of Remedial Action. The objectives of this remedial action include the following qualitative and quantitative objectives, as determined to be appropriate for the site. Based on the factors identified in Section 8.4 of the Regulations Governing Hazardous Substance Cleanup, the following RAOs were identified:

Qualitative Objectives

1. Prevent or minimize onsite and offsite migration of site-related contaminants.
2. Prevent human exposure (e.g., dermal, inhalation, and/or ingestion) to site-related contaminants (PAHs and arsenic) in source materials and on-site soil in exceedance of Delaware Non-Critical Water Resource Area Restricted Use URS values.
3. Protect environmental receptors by preventing or minimizing the potential for future migration of site-related materials off-site and direct contact with on-site soils. Active offsite remediation is not final within this plan. Offsite impact will be further evaluated and a separate proposed plan of remedial action will be submitted for WCGS-N/ OU-02, the offsite portion of site.

Quantitative Objectives

1. Prevent human contact with site soil and groundwater that have constituents which exceed 10 E-05 cumulative cancer risks.

These objectives are consistent with the current and planned use of the site as an industrial and/or commercial use in an urban setting, New Castle County zoning policies, State, and City of Wilmington regulations governing water supply and worker health and safety.

FINAL PLAN OF REMEDIAL ACTION (WCGS-N/OU-01)

Based on DNREC's evaluation of the site information and the above remedial action objectives, several alternatives were evaluated. Management strategies for the treatment of NAPL and the treatment of contaminant-impacted soils were evaluated independently within the FFS. The results are summarized as follows. Figure #2 presents a conceptual layout showing the final remedy.

1. Excavation and appropriate disposal of soils and petroleum free product around well TPW-17 [to an area of less than one foot of product] to greatly reduce the source area; as per a remedial action plan that shall be submitted within 30 days of issuance of the final plan of remedial action to DNREC for approval. As shown in Figure 2, TPW-17 is located in the southwest corner of the property within NAPL Area 1.
2. Excavation of petroleum contaminated soils and management of petroleum contaminated groundwater, in accordance with a contaminated materials management plan to be submitted by Delmarva for approval by DNREC, any other entities or prospective

purchaser seeking to change the current use of the property, (i.e. redevelopment of the property). In the event of a change in ownership of the property, the prospective purchaser or other entity securing rights to change the use of the property must also submit a contaminated materials management plan to implement the requirements of this paragraph and obtain approval of said plan from DNREC prior to redeveloping the property.

3. Installation of a subsurface containment wall with passive NAPL recovery sumps within the fenced area along South Madison Street from Beech Street to CSO #30 as per a remedial design plan submitted within 60 days of issuance of a final plan to DNREC for approval. The purpose of this containment wall is to prevent on site contamination from migrating off-site and removal of residual NAPL on site.
4. Use of phytoremediation immediately up gradient from the containment wall in order to prevent groundwater mounding and mitigate off-site migration. The specific details of this aspect of the remedy shall be included in the remedial design plan that is to be submitted to DNREC within 60 days of issuance of this final plan for approval.
5. Capping of exposed on-site soils with asphalt paving materials as necessary to prevent exposure to contaminated soils on site. Any soil moving activities, including grading will be done in accordance with a DNREC approved Soil and Sediment Control Plan.
6. Installation of at least three (3) groundwater monitoring wells off-site, down gradient of the containment wall in the area of South Madison Street (as seen in Figure #2), to evaluate the effectiveness of the containment wall and monitor off-site conditions.
7. Placement in property records and maintenance for the life of the property of a deed restriction on the property (26-042.00-003) within ninety (90) days following DNREC's adoption of the final plan: a) prohibiting current and future residential use of the property; b) prohibiting any digging, drilling, excavating, grading, constructing, earth-moving, or any other land-disturbing activities on the property without the prior written approval of the DNREC; c) requiring written approval from DNREC prior to any repair, renovation or demolition of the existing paved surfaces and buildings pursuant to the remedy for the site; and d) prohibiting the installation of any water well on, or use of groundwater at, the site without the prior written approval of DNREC; (e) noting that the site is located within the Groundwater Management Zone (GMZ) for the City of Wilmington.
8. Within 90 days of the issuance of the signed final plan, prepare and implement a DNREC-approved Operation and Maintenance (O&M) plan, which outlines the groundwater monitoring requirements, maintenance of the structures to include but not limited to the containment wall, monitoring wells, wellcaps, etc, and the concrete/asphalt caps pursuant to the remedy. Under this plan, the groundwater will be monitored until DNREC approves modification or cessation of the approved groundwater monitoring. There will be a 5-year review performed to evaluate the remedy, at which time, additional DNREC-approved measures may be required at that time.

A proposed plan of remedial action will be submitted under separate cover at a later date for off-site WCGS-N/ OU-02 following further evaluation of OU-02.

PUBLIC PARTICIPATION

The Department actively solicited public comments or suggestions on the proposed plan and welcomed opportunities to answer questions. The public comment period for the proposed plan began on August 23, 2004, and concluded at the close of business September 13, 2004. No written comments or requests for a public hearing were received by DNREC.

DECLARATION

This final plan of remedial action for the Wilmington Coal Gas Site – Northern Parcel OU-01 is protective of human health, welfare and the environment and is consistent with the requirements of the Delaware Hazardous Substance Cleanup Act.


John Blevins, Director
Division of Air and Waste Management

9/28/04
Date

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Wilmington Coal Gas Site – Northern Parcel OU-01
Final Plan of Remedial Action



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Source: U.S.G.S. Topographic Maps (7.5 Minute)
Wilmington South, DE quadrangle



CONNECTIV RESOURCE PARTNERS, INC.
WILMINGTON COAL GAS SITE
NORTHERN PARCEL
WILMINGTON, DE

FIGURE 1
SITE LOCATION



FOSTER WHEELER ENVIRONMENTAL CORPORATION

Wilmington Coal Gas Site – Northern Parcel OU-01
Final Plan of Remedial Action

