PROPOSED PLAN OF REMEDIAL ACTION

WEST STREET CONNECTOR EXTENSION

Road Box and Associated Construction

Wilmington Riverfront Transportation Improvements

Wilmington, Delaware

DNREC Project No. DE-1157

September 2002

Department of Natural Resources and Environmental Control
Division of Air and Waste Management
Site Investigation and Restoration Branch
391 Lukens Drive
New Castle, Delaware 19720

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1.0 INTRODUCTION

In response to requests from the State of Delaware, the City of Wilmington, and the business community, the Delaware Department of Transportation (DelDOT) plans to construct a second ingress/egress road in the Christina Riverfront area to supplement South Madison Street. The new road, called the West Street Connector Extension (site), will be constructed west of South Madison Street to improve traffic flow into and out of the Stadium, Shipyard Shops and Riverfront Arts Center area. In addition to the roadways, DelDOT will also create alternate transportation routes, including bicycling and walking paths along this corridor. These improvements will continue to facilitate the redevelopment of the Christina Riverfront area, which was historically a heavy industry area.

Because of its industrial past, the soil in the Christina Riverfront area has been impacted by a variety of industrial contaminants, including total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), lead and arsenic. In June 1999, DelDOT entered into a Voluntary Cleanup Program (VCP) Agreement with the Department of Natural Resources and Environmental Control, Site Investigation and Restoration Branch (DNREC) to perform a Remedial Investigation (RI) and a Feasibility Study (FS) at the site, pursuant to the Hazardous Substance Cleanup Act (HSCA), 7 Del. C. Chapter 91. DelDOT contracted WIK Associates, Inc. (WIK Associates) to perform the RI/FS of the site.

The purpose of the RI/FS was to:

1. Perform a RI to characterize the surface and subsurface soil within the project area using the same approach as on the previous West Street Connector Project (DE-1085).

2. Develop interim action and remedial action plans, if needed, to insure that the project is constructed in a manner that is protective of public health and the environment, and that is consistent with the 1998 Memorandum of Understanding (MOU) between DelDOT and DNREC.

3) Obtain a Certification of Completion of Remedy from DNREC for the roadway improvement project.

To accomplish these purposes, DelDOT performed soil borings, sampling and analysis along the planned road right-of-way to characterize the existing levels of contaminants from past industrial practices. The collection and analysis of these soil samples were performed in accordance with the Delaware Regulations Governing Hazardous Substance Cleanup (Regulations), Delaware Standard Operating Procedures for Chemical Analytical Programs (SOPCAP), DNREC guidance documents and other applicable DNREC policies and procedures. The analytical information collected by DelDOT was supplemented with data from previous soil investigations on other properties in and around the planned roadway.

This document is the DNREC's proposed plan of remedial action (proposed plan) for the site. It is based on the results of the RI/FS and other previous investigations performed at the site. This proposed plan is issued under the provisions of the HSCA and the Regulations. It presents the Department's assessment of the potential health and environmental risks posed by the site.

This proposed plan addresses shallow and subsurface soil within the road box and concurrent construction activities. This proposed plan also addresses subsurface petroleum free product found at the site. It is the intent of this proposed plan to treat groundwater and any petroleum free product found at the site as a separate operable unit to eliminate concerns that the planned roadway may need to be removed after it is constructed to accommodate future remediation of petroleum free product and/or groundwater at the Site.

This proposed plan also discusses the two interim which included the replacement of a section of the Shipley Run combined sewer overflow (CSO) systems, and the replacement and soil stabilization of a section of the Clements Run CSO system. Further plans for remediation of contaminated groundwater and petroleum free product at this site will be discussed in the proposed plan for the Wilmington Coal Gas North site pending conclusion of the remedial investigation currently being performed at that site by Conectiv.

The proposed plan is based on the following documents prepared by WIK Associates on behalf of DelDOT:

- Remedial Investigation Report (August 1999)
- Focused Feasibility Study (September 1999)
- Supplemental Remedial Investigation Report (March 2000)
- Soil Risk Calculations Summary (May 2001)
- Pole Barn Relocation Soil Sampling (May 2001)
- Additional Soil Risk Calculations (June 2001)
- Summary of Shipley Run and Clements Run CSO Reconstruction (February 2002)

As described in Section 12 of the Regulations, DNREC will provide notice to the public and an opportunity for the public to comment on the proposed plan. At the comment period's conclusion, DNREC will review and consider all of the comments received and then DNREC will issue a final plan of remedial action (final plan). The final plan will designate the selected remedy for the site. The RI/FS and other investigations of the site, the proposed plan, the comments received from the public, DNREC's responses to those comments, and the final plan will constitute the Remedial Decision Record for the site.

Section 2.0 presents a summary of the project description and site history. Section 3.0 provides a description of previous investigations of the site. Section 4.0 presents a discussion of the remedial action objectives. Section 5.0 presents the proposed plan of remedial action. Section 6.0 discusses public participation requirements.

2.0 PROJECT DESCRIPTION AND SITE HISTORY

2.1 Project Description

The proposed sSite improvements are located west of the Christina River in South Wilmington, Delaware (Figure 1). The improvements include construction of a new two-lane roadway extending 400 meters (1/4 mile) from the intersection of West Street (the Connector) and South Madison Street to Beech Street, and a concrete sidewalk along the north side of Beech Street from South Madison Street, extending west, to tie into the existing sidewalk/road located

immediately west of the Amtrak viaduct. A portion of the roadway will lie directly beneath the Interstate 95 (I-95) viaduct.

The overall extension project area consists of approximately 5 acres of land, comprising portions of tax parcels currently owned by the State of Delaware, Norfolk Southern Railroad, the City of Wilmington and Connectiv, formerly Delmarva Power and Light Company.

The roadway project has been designed and engineered to minimize the need for significant amounts of soil excavation. The preliminary design plans show that most of the roadway construction project involves building the road on top of existing grade or raising the grade with fill and constructing the road on top of the fill. There are two existing buildings that will be demolished to make way for the road. Both buildings, a pole barn and a vehicle maintenance building, are owned and used by Connectiv.

Minor soil excavation will occur during road construction including trenches to install and/or relocate utilities and storm water lines associated with the road extension project. There are two areas of this project where soil excavations have already been completed as interim actions. These areas are the City of Wilmington's Shipley Run and Clements Run CSOs. Structural support for the CSO pipes was necessary prior to building the road above them. From June 2001 to January 2002, DelDOT's contractor worked to reconstruct a section of the Shipley Run and Clements Run CSOs. Using this approach, soil was excavated around each of the CSO sewer lines to a depth of approximately 13 feet below ground surface. Minimal excavation was required at the CSOs. Construction dewatering was performed during these activities and all discharges were to the sanitary sewer in accordance with the City of Wilmington's discharge permit. The completion of this work was summarized in a letter from WIK Associates dated February 1, 2002.

Figure 1 shows the project area, including the road extension right-of-way, the Shipley and Clements Run CSO reconstruction areas, and the location of the replacement pole barn.

2.2 Site History

Based on a review of historical directories, maps, existing environmental reports and interviews, several possible sources of historic contamination were identified on the subject property and in the immediate vicinity of the Site. The planned road improvements are located on properties that were historically the Wilmington Coal Gas Company's, fueling areas and railroads.

The area in and around the planned transportation improvements was the site of ship building and other heavy industrial activities since the 1800s. Much of the area was reclaimed from marshland by filling with slag and other industrial waste products. Previous environmental investigations identified the former usage of surrounding properties as tanneries, heavy industry (shipyards, railcar builders, and machine companies), a manufactured gas plant, and a municipal garbage disposal yard/incinerator. The potential contaminants of concern associated with these industries include metals (from tanneries and heavy industry), petroleum hydrocarbons including PAHs (from coal gas operations and tanneries), and PCBs (from railroads and electrical equipment).

3.0 INVESTIGATION RESULTS

WIK Associates performed a RI on behalf of DelDOT in May 1999, in order to characterize the extension project area. Twelve soil borings were drilled and 21 soil samples were collected for laboratory screening analysis for TPH, BTEX, PAHs, RCRA Metals and PCBs by Mitkem Corporation in Warwick, RI. Based on laboratory field screening, 20% of the samples (five samples) were selected for HSCA analysis at STL Envirotech in Edison, NJ for VOCs, SVOCs, pesticides, PCBs, metals, and cyanide. Analytical data from previous soil samples on adjacent properties were also evaluated to supplement the RI samples. All HSCA analytical data was evaluated and validated in accordance with the HSCA SOPCAP.

During the May 1999 RI, the compounds in soils that exceeded the DNREC Uniform Risk-Based Standard (URS) values (DNREC-SIRB, February 1998) for restricted use in a non-critical water resource area were benzo(a)pyrene in four of the five samples, excluding only EX10-S003. The highest concentration was found in sample EX08-S002 at a concentration of approximately 60 milligrams per kilogram (mg/kg). The remaining three samples contained benzo(a)pyrene concentrations of 1 mg/kg, 2 mg/kg, and 6.9 mg/kg. The corresponding URS for benzo(a)pyrene is 0.8 mg/kg. Benzo(a)anthracene was present at a concentration of 94 mg/kg in EX08-S002. The URS value is 8 mg/kg. Samples EX08-S002 and EX05-S001 contained concentrations of benzo(b)fluoranthene that exceeded the URS of 8 mg/kg. The concentrations in the samples were: 48 mg/kg and 25 mg/kg respectively. Indeno(1,2,3-cd)pyrene was found to exceed the corresponding URS in one sample. The concentration was 15 mg/kg, as compared to the URS of 8 mg/kg. Dibenz(a,h)anthracene was also found in EX05-S001 at a concentration of 2.5 mg/kg, (URS of 0.8 mg/kg). These results are summarized in the attached tables. DelDOT's environmental consultant used the soil results to assign soil re-use and disposal categories so that the transportation design engineers could calculate how much of the excavated soil could be reused, how much needed to be disposed off-site, and how much imported fill was necessary for the road construction project.

As shown in Table 2 from the RI report, free product/oily soil was noted in borings EX05 and EX08 from the RI, in test pit TP-11 from the DNREC Brownfield Preliminary Assessment II for the Wilmington Public Works Yard (June 1997), and in boring GP501 of the West Street Connector project (September 1998).

In May 2001, DelDOT's environmental consultant compared the soil contaminant concentrations on the road extension right-of-way to current restricted use (i.e., commercial or industrial use) URS values and evaluated the cumulative risk associated with the soil at the site using the "DNREC-SIRB Site-Specific Calculator" (May 2000 Version) for both the saturated and unsaturated zones. The calculated cumulative cancer risk associated with the soil samples collected above and below the groundwater table was 2.70E-05 and the Hazard Index was 0.13, which exceeds the DNREC risk guideline of $1x10^{-5}$ (DNREC-SIRB, 1996).

At the request of DNREC, DelDOT's environmental consultant performed additional risk calculations for the unsaturated soil screening data collected during the West Street Extension RI. This analysis showed that using the maximum detections, the calculated cancer risk would be 2.28E-05 and Hazard Index would be 0.19; and using the 95% upper confidence level (UCL), the calculated cancer risk would be 1.12E-05 and a Hazard Index of 0.06. Arsenic and PAHs

were the individual compounds that contributed to the elevated risk. These calculations are detailed in the June 5, 2001, Additional Soil Risk Calculation letter report. Additional calculations were performed for data both above and below the groundwater table (unsaturated and saturated soil).

The HSCA risk assessment comparison demonstrated that, with the exception of EX08-S002 (a sample collected below the groundwater table in an area of free product), the cumulative risk associated with the soil samples collected above and below the groundwater table on the West Street Extension road right-of-way is 2.70E-05 and the Hazard Index is 0.13, which exceeds the DNREC's risk guideline of $1x10^{-5}$ (DNREC-SIRB, 1996). Based on the risk assessment, the soil does pose an unacceptable risk to the human health and the environment for restricted use. As described above, remedial alternatives for the saturated zone will be evaluated in the poposed pan for the Wilmington Coal Gas North Site.

4.0 REMEDIAL ACTION OBJECTIVES

Remedial action objectives have been established in accordance with HSCA Regulation 8.4(1), based on the following factors:

- The Site is currently zoned as commercial and industrial land; most of it is vacant; a portion of the etension right-of-way crosses Connectiv's maintenance yard, including two existing buildings.
- The future site use is expected to be paved roadway, commercial and open space.
- The site is within 1,000 - 1,500 feet of the Christina River.
- Surrounding land uses are mixed, including manufacturing, commercial and residential.
- Soil at the site has been impacted by various chemical constituents. Based on the RI and supporting risk calculations, free-phase petroleum hydrocarbons, PAHs, and arsenic are the primary contaminants of concern.
- The primary exposure pathways are inhalation; direct contact with, and incidental ingestion of, impacted soil, erosional transport to the Christina River, and dewatered groundwater.
- The major risk associated with the site is potential human contact with impacted soil.

Qualitative Remedial Objectives

Based on the above factors, the following qualitative remedial action objectives were developed:

- Prevent potential human contact (dermal and ingestion) with contaminated soil and any groundwater.

- Prevent potential contaminated soil erosion to the Christina River.

- Remove, and properly dispose off-site, any excavated soil that may be generated during road construction or CSO replacement that contains free-phase petroleum (including soil containing oil or an oily sheen).

Quantitative Remedial Objectives

Based on the above qualitative remedial action objectives, the following quantitative remedial action objectives were developed:

- Prevent human contact with soil contaminants exceeding $1X10^{-5}$ risk and hazard index of 1.0.

- Ensure that future site users, such as future employees, construction workers and visitors are not exposed to petroleum free product and groundwater contamination above the DNREC-SIRB's risk guideline of 1E-05.

The proposed remedial actions are based upon the Remedial Action Objectives and the 1998 MOU between DNREC and DelDOT.

5.0 PROPOSED PLAN OF REMEDIAL ACTION

Based on DNREC's evaluation of the site information and the above remedial action objectives, the recommended remedial action for the soils and groundwater will include the following:

- Removal and selective re-use of excavated materials and capping low-permeability surface as detailed in the construction plans for the road bed development and associated road and sidewalks. Excavated material must be managed pursuant to the "SIRB Presumptive Soil Reuse Guidelines" as outlined in Table 1.

- The placement of an institutional control (i.e., DNREC-approved deed restriction) which will restrict the Site to commercial and industrial use and prohibit any land disturbing activities under the road box without the prior written approval of DNREC.

- The site is currently in a Groundwater Management Zone (GMZ) that encompasses the City of Wilmington. Therefore, well installation and the future use, of groundwater beneath the site is already restricted, which shall be included in the deed restriction.

The petroleum-free product in soils, non-aqueous layers of petroleum in the subsurface, coal tar wastes, and contaminated groundwater found at the West Street Connector Extension site, will be addressed by means other than excavation by the respective property owners. The details of how these releases will be addressed will be described in a separate, but related proposed plan for the Wilmington Coal Gas North (WCGN) property. A remedial investigation is currently being conducted at the WCGN site, which will lead to the preparation and advertisement of a Proposed Plan for the WCGN site.

This decision is based on the following criteria, which include:

- Protection of public health, welfare, and the environment;
- Compliance with all applicable local, state and federal laws;
- Technical practicability; and
- Long and short-term effectiveness.

6.0 PUBLIC PARTICIPATION

The Department actively solicits public comments or suggestions on the proposed plan of remedial action and welcomes opportunities to answers questions. Please direct written comments to:

DNREC Site Investigation and Restoration Branch
391 Lukens Drive
New Castle, DE 19720
Attn: Lynn Krueger

The public comment period begins on Monday, September 16, 2002 and will close on Monday, October 7, 2002. Comments and/or requests for a public hearing may be submitted in writing to Lynn Krueger by the close of business (4:30 p.m.) on August XX, 2002 at the above referenced address.

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Figure 1: Project Area Map

Table 1: SIRB Presumptive Soil Re-Use Guidelines

Table 2: West Street Extension, Screening Data-Unsaturated Soil (Maximum Concentration)

Table 3: West Street Extension, Screening Data-Unsaturated Soil (95% UCL)

Table 4: West Street Extension, All HSCA Data except EX08-S002 (Maximum)

Table 5: Soil Analytical Data STL Envirotech - SVOCs West Street Connector Extension Remedial Investigation

Table 6: Soil Analytical Data from STL Envirotech - Metals and Cyanide West Street Connector Extension Remedial Investigation