SECOND FINAL PLAN OF REMEDIAL ACTION

Jackson Pit
Lewes, Delaware

DE - 0149

August 2003

Delaware Department of Natural Resources & Environmental Control
Division of Air and Waste Management
Site Investigation and Restoration Branch

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1.0 INTRODUCTION

The Jackson Pit (site) is located southwest of the town of Lewes in Sussex County, Delaware (Figure 1). The site occupies 15.55 acres, and is accessible from Route 275, southwest of Lewes. The site is bordered by Route 276 to the northwest, and crop land and wooded area to the south. It includes a former borrow pit and various waste disposal areas. Originally, Mr. Mark Slaughter purchased only a 5.05-acre portion of the site. In February 2003, a final plan of remedial action (final plan) was issued for this parcel, operable unit 1 (OU 1). However, Mr. Slaughter purchased the remaining 10.50 acres of the property at a later date. Therefore, this second final plan will include the investigation findings on both OU 1 and the additional parcel OU 2. The site is now defined by DNREC as both parcels and DNREC will discuss risk and proposed remedial actions in terms of the site consisting of both OU 1 and OU 2.

The Department of Natural Resources and Environmental Control (DNREC or the Department) performed a facility evaluation (FE) on the site in November 1997. The purpose of the FE was to: 1) collect additional information from the site and review information from previous environmental investigations, 2) understand the nature and extent of any soil and/or groundwater contamination at the site, and 3) evaluate risks to public health, welfare and the environment associated with any identified contamination. Mr. Mark Slaughter contracted with the Environmental Solutions Group (ESG) in March 2002 to conduct additional groundwater testing. DNREC considers the FE and the additional groundwater testing on the site to be equivalent to a remedial investigation. Mr. Slaughter desires to obtain a Certification of Completion of Remedy (COCR) from DNREC upon completion of all required tasks.

This document is the Department's second final plan of remedial action (second final plan) for the site. It is based on the results of the previous investigations performed at the site. This second final plan is issued under the provisions of the Hazardous Substance Cleanup Act (HSCA), 7 Del. C. Chapter 91 and the Regulations Governing Hazardous Substance Cleanup (Regulations). It presents the Department's assessment of the potential health and environmental risk posed by the site.

In accordance with Section 12 of the Regulations, DNREC provided notice to the public and an opportunity for the public to comment on the second proposed plan. During the comment period of April 7, 2003 through April 28, 2003, DNREC received no comments on the second proposed plan and can subsequently issue this second final plan. The final plan designates the selected remedy for the site. All prior investigations of the site, the second proposed plan, and the second final plan will constitute the remedial decision record.

Section 2 presents a summary of the site description, site history and previous investigations of the site. Section 3 provides a description of the remedial investigation results. Section 4 presents a discussion of the remedial objectives. Section 5 presents the proposed plan of remedial action. Section 6 discusses public participation requirements.

2.0 SITE DESCRIPTION AND HISTORY

The site is located southwest of the Town of Lewes in Sussex County, Delaware and is accessible from Route 275 heading southeast from Five Points. The site occupies 15.55 acres of

land and consists of two parcels, Sussex County tax parcel #3-34 6.00 504.07 and #3-34 6.00 504.03. It is bordered by Route 276 to the northwest and crop land and wooded area to the south (Figure 2). There is a borrow pit as well as waste disposal areas containing piles of wood debris, asphalt and concrete. The pit is approximately 30 feet deep and is described to have had a flat sand floor with 3 to 7 foot walls composed of wood, brush, bricks and cement debris.

The nearest water supply well is located approximately 400 feet to the southwest. Residential homes with domestic wells are located along Route 276, approximately 1,000 feet northwest of the landfill area. A public water supply well for a residential development is located approximately 1,500 feet southwest of the landfill area. The Town of Lewes operates five municipal wells located along Route 9, approximately one mile northeast of the site.

2.1 Site and Project History

Mr. Harland Jackson acquired a 21.54-acre lot during the early 1960s. He operated a garbage dump on the site for many years after it was used as a borrow pit. Dumping occurred from at least the 1970s until 1982. Specific areas of the site contain suspected buried municipal waste. Numerous debris fires occurred at the dumpsite during the late 1970s. DNREC's Solid and Hazardous Waste Management Branch (DNREC-SHWMB) granted Mr. Jackson approval to dispose of tree stumps, lumber and masonry materials on the site until 1993. During this operation, local residents witnessed sewage disposal trucks entering the landfill area. In recent years, the owners have maintained minimal security to restrict illegal dumpers. However, based on observations made during a recent site visit, only a limited amount of dumping has occurred.

In 2002, Mark Slaughter contacted DNREC, and hired Environmental Solutions Group, Inc. (ESG) to excavate test pits and to perform additional groundwater monitoring on the site. Subsequently, ESG submitted the results to DNREC. Mr. Slaughter intends to redevelop the property for townhouses.

3.0 INVESTIGATION RESULTS

DNREC conducted an extensive review of past investigations prepared for the property as discussed below.

3.1 Preliminary Assessment

In October 1986, a preliminary assessment (PA) was performed by the DNREC. No environmental samples were collected during the PA. Based on the results of the PA, no further action was recommended.

3.2 Site Investigation

In September 1988, NUS Corporation conducted a site inspection (SI) under contract from the U.S. Environmental Protection Agency (EPA). The SI report indicates that during the 1970s, only household garbage, wood, and brick debris was dumped at the site. Glass bottles, cans, plastics, and various household trash items were exposed in an area approximately 100 feet long by 25 feet wide. According to a DNREC representative, prior to the SI, approximately 15 to18

feet of fill material was placed at the property. At the time, the property was leveled from sand and gravel disposal and grading that had occurred.

Only one soil sample (CK 249/MCJ 125) was taken on the site. The analytical results from the SI indicated that the results for the soil sample identified the presence of 1, 1-dichloroethane (0.006 milligrams per kilogram or mg/kg) and toluene (0.009 mg/kg), but at concentrations that are well below the current Uniform Risk Standards (URS) value for unrestricted use (i.e., residential use) of the property, of 780 mg/kg and 650 mg/kg, respectively.

3.3 Facility Evaluation

A facility evaluation (FE) was conducted by DNREC in November 1997. The FE work plan called for DNREC to perform the following tasks:

- Install shallow, groundwater monitoring wells and collect groundwater samples from the unconfined aquifer; and
- Excavate test pits of the waste disposal areas and collect soil/waste samples, including one background soil sample.

3.3.1 Soils

DNREC excavated fourteen test pits on both OU 1 and OU 2 and took soil samples for laboratory analysis (Figure 3). In test pit numbers 3, 7, and 11 (TP-3, TP-7, TP-11), iron (4,460 mg/kg, 6450 mg/kg, 2,660 mg/kg) exceeded the unrestricted URS value of 2,300 mg/kg, for subsurface soil in samples collected at depths of 3-10 feet below ground surface. Also in TP-7 and TP-11, there was an exceedence of the unrestricted URS value for benzo(a)pyrene (0.09 mg/kg) with results of 0.24 mg/kg and 0.37 mg/kg, respectively. There were no other exceedences found in the soil samples from the remaining test pits, including the seven test pits found on OU 2.

3.3.2 Groundwater

DNREC installed three monitoring wells on the site consisting of OU 1 and OU 2. DNREC collected one groundwater sample from each well as part of the FE. Aluminum (417 µg/L), and total chromium (14.3 µg/L), exceeded the URS value of 200 µg/L, and 11 µg/L, respectively, for groundwater in monitoring well number 1 (MW-1). Manganese exceeded the URS value of 50 µg/L for groundwater in both MW-1 and MW-3 with detected concentrations of 234 micrograms per liter or µg/L and 1060 µg/L, respectively. Trace levels of semi-volatile organic compounds were found to be present in MW-3 and trace levels of the pesticide, p,p – DDD were found to be present in MW-2, but at concentrations well below their respective URS values for unrestricted use.

3.3.3 Summary

The results of the investigations indicated contaminants were detected on the site at levels exceeding the URS values for unrestricted land use. Specifically, in TP-3, TP-7 and TP-11, iron exceeded the values for subsurface soil in the soil samples collected at depths of 3-10 feet below

ground surface. Also in TP-7 and TP-11, benzo(a)pyrene exceeded the URS value for subsurface soil in the soil samples collected at depths of 3-10 feet below ground surface. There were no other exceedences found the samples collected from the other test pits.

Total chromium and aluminum exceeded the URS value for groundwater in MW-1 and manganese exceeded the URS value for groundwater in both MW-1 and MW-3. Elevated concentrations of semi-volatile organic compounds and the pesticide, p, p – DDD were found, but in quantities that are well below their respective URS values for unrestricted use.

It is important to note that aluminum and manganese are naturally occurring elements in Delaware's groundwater and their URS values found in DNREC's remediation standards guidance documents are based on National Secondary Drinking Water Regulations (NSDWR). NSDWRs are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water, and do not pose a human health risk.

3.4 Additional Test Pit Evaluation

Four test pits were excavated in the vicinity of the former borrow pit, at depths ranging from 8 to 10 feet, and in approximately the same locations as TP-2, TP-3, TP-6, and TP-7 of the FE. As previously indicated, bricks, logs, concrete and pieces of trash were the types of debris encountered. No additional soil sampling was performed in this evaluation

3.5 Additional Groundwater Sampling

At the request of Mr. Slaughter, Environmental Solutions Group, Inc. (ESG) collected additional groundwater samples from MW-1 and MW-2 in March 2002. Prior to sampling, ESG consulted DNREC on the contaminants of concern in the groundwater found on this property. These included: chromium, pesticides and PCBs. Initial samples taken from MW-1 and MW-2 in March 2002, were analyzed by Lancaster Laboratories, Inc. of Lancaster, PA. The only contaminants detected in the groundwater samples were: total chromium and the pesticide, p,p-DDD. An elevated level of total chromium was also detected in MW-1. Both groundwater wells were resampled to speciate the concentrations of trivalent and hexavalent chromium. The results from this round of sampling showed no evidence in either well of elevated levels of hexavalent or trivalent chromium. MW-2 was found to contain a detectable level of p,p-DDD. However, the concentration of the pesticide found was 0.036 µg/L, which is below the URS value for groundwater of 0.30 µg/L. PCBs were present in the samples at or below their detection limits. The results for chromium from the second round of sampling were used in DNREC's risk analysis. A sample was collected from MW-3 on July 17, 2002. The sample was analyzed for metals. No metals were detected above the respective detection limits.

3.6 Risk Evaluation

Based on applying DNREC's Site Specific Risk Calculator, using the highest soil contaminant concentrations exceeding the corresponding URS value for unrestricted use, the soil on the site does not pose a risk to human health that would require a remedial action under the HSCA program. The calculated cancer risk was 4.23×10^{-6}, which is less than 1×10^{-5}, the accepted risk

allowed by the Department's Regulations. The calculated non-cancer risk was 0.27, which is less than a Hazard Index of 1.0. Therefore, remedial action for soils is not necessary.

The Site Specific Risk Calculator was also used for an evaluation of the risk posed by the contaminants present in the groundwater in MW-1, MW-2, and MW-3. The results were based on the highest concentration of each contaminant found in any of the three wells and were shown to pose no cancer risk. The calculated non-carcinogenic risk posed was 0.22, which does not exceed the Hazard Index of 1.0

DNREC has determined that there are fluctuations in the quality of groundwater found in the unconfined aquifer, which are probably not attributable to background or naturally occurring conditions, but are likely to be associated with the breakdown of buried solid waste. Results achieved from a study done by the SHWMB in August 1995 show high total organic carbon (TOC), chemical oxygen demand (COD), and sulfate concentrations in the shallow groundwater. This fact combined with elevated concentrations of metals such as iron and manganese shown in results obtained from various sampling events at the site, are indicative of the presence of petroleum products leaching from the soil. Since solid waste is suspected to remain on-site and it may remain on-site after it is redeveloped, continued monitoring of groundwater would be necessary in the absence of other institutional controls. Therefore, DNREC gave Mr. Slaughter the option of either monitoring the shallow groundwater annually for five years in order to determine if, in fact, the groundwater quality is continuing to degrade, or placing a deed restriction on the property in order to restrict shallow groundwater use in the area , thus eliminating any future human exposure to groundwater where the quality may be questionable. Mr. Slaughter chose to deed restrict the property rather than perform continued monitoring.

4.0 REMEDIAL ACTION OBJECTIVES

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

Qualitative objectives describe, in general terms, what the ultimate result of the remedial action, if necessary, should be. The following qualitative objective is determined to be appropriate for the site:

- Prevent human exposure to shallow groundwater whose quality is potentially susceptible to degradation due to buried solid waste present on the site.

This objective is consistent with the proposed use of the site for townhouses, Sussex County zoning policies, state regulations governing water supply, and worker health and safety.

Quantitative objectives define specific levels of remedial action to achieve protection of human health and the environment. Based on the above qualitative objectives, the quantitative objectives will be to ensure that future site users such as residents, construction workers, visitors, and trespassers do not come in contact with soils and groundwater that contain constituents which exceed a cumulative cancer risk of $1x10^{-5}$.

5.0 PROPOSED PLAN OF REMEDIAL ACTION

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

- The property owner shall place a deed restriction on the site, no longer than ninety days following DNREC's adoption of the final plan. The deed restriction will prohibit the installation of any shallow water wells on, or groundwater usage at the site without prior written approval of DNREC, and will identify the site as located within a groundwater management zone (GMZ) which is an internal DNREC document that restricts groundwater withdrawals at the site.

In addition, DNREC recommends that the property owner remove any non-hazardous solid waste found on the property during regrading activities on the site. However, if any evidence of soil contamination and/or hazardous substances/wastes are identified by visual inspection, field screening, or environmental testing, during the site clearing and regrading, then the owner must notify DNREC pursuant to 7 Del. C. § 6028. If a release of a hazardous substance is found, further action pursuant to the regulations governing hazardous substance cleanup may be required.

6.0 PUBLIC PARTICIPATION

The Department actively solicited public comments or suggestions on the second proposed plan of remedial action. The public comment period began on, April 7, 2003 and ended at the close of business April 28, 2003. No comments were received during the public comment period.

7.0 DECLARATION

This final plan of remedial action for the Jackson Pit site is protective of human health, welfare, and the environment and is consistent with the requirements of the Delaware Hazardous Substance Cleanup Act.

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John Blevins, Director Date
Division of Air and Waste Management

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Figure 1: SITE LOCATION

Figure 2: AERIAL PHOTOGRAPH

Figure 3: SAMPLE LOCATION MAP