

## PROPOSED PLAN OF REMEDIAL ACTION

Hercules Road & Lancaster Pike Site  
Wilmington, Delaware  
DNREC Project No. DE-1492



November 2011

Delaware Department of Natural Resources and Environmental Control  
Division of Waste and Hazardous Substances  
Site Investigation & Restoration Section  
391 Lukens Drive  
New Castle, Delaware 19720

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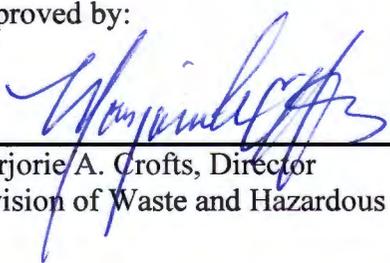
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Hercules Road & Lancaster Pike Site  
Wilmington, Delaware  
DNREC Project No. DE-1492



**Approval:**

This Proposed Plan meets the requirements of the Hazardous Substance Cleanup Act.

Approved by:

Marjorie A. Crofts, Director Division of Waste and Hazardous Substances
11.28.11
Date



### **What is the Hercules Road & Lancaster Pike Site?**

The Site is the former location of the Delaware National Country Club. The Site is depicted in Figure 1. The developer (Toll Brothers, Inc.) entered into the Department of Natural Resources and Environmental Control - Site Investigation and Restoration Section's (DNREC-SIRS) Prospective Purchase Agreement (PPA) to conduct a remedial investigation (RI) of the property under the provisions of the Delaware Hazardous Substance Cleanup Act (HSCA), 7 Del. C. Chapter 91. Through the PPA, Toll Brothers, Inc., agreed to investigate the potential risks posed to public health, welfare and the environment at the Site.

**Tax Parcel Numbers:** 08-027.00-001, 08-027.00-007, 07-031.00-014, and 07-031.00-001  
**Address:** 0 Hercules Road, 400 Hercules Road, 0 Penn Oak Drive, and 5600 Lancaster Pike, Wilmington, Delaware  
**Nearest major intersection:** Hercules Road and Lancaster Pike  
**Surrounding Property:** Surrounding land use is generally residential, commercial, and industrial. Numerous residences and several roads surround the subject property. The Ashland (formerly Hercules) Research Center, which consists primarily of research and product development laboratories, operates on most of the property to the south.  
**Zoning:** S-UDC-Suburban  
**Site Utilities:** Electric, water, sewer are provided by public utilities. The research center operates a private supply well.  
**Surface water:** The Red Clay Creek flows through the center of the Site.  
**Topography:** The topography varies across the Site ranging from 80 to 200 feet above sea level. The Site was formerly used as a golf course and is predominantly covered by vegetation and woodland.  
**Groundwater:** Groundwater was encountered at depths ranging from 7 to 28 feet below ground surface. The groundwater is controlled by topography and appears to flow in multiple compass directions. Groundwater in the overburden is only encountered in areas with a sufficient thickness of soil material above bed rock and is generally confined to lowland areas. Groundwater generally flows toward the Red Clay Creek.

### **What happened at the Hercules Road & Lancaster Pike Site?**

The Site was historically maintained primarily as wooded land until it was developed as a golf course by the Hercules Country Club starting in the late 1930s (the eastern side of the Site was not developed until the 1960s). The Site has been consistently used as a golf course and country club until 2011 and is currently vacant. Site investigations indicate that a small portion of the Site around the red equipment barn has been filled (2 - 3 feet deep).

## **What is the environmental problem at the Hercules Road & Lancaster Pike Site?**

Environmental investigations indicate the following problems:

- Arsenic, chlordane, heptachlor epoxide, and mercury are contaminants of concern (COCs) in the surface soil in the former golf course playing areas (tees, fairways, and greens).
- Arsenic, barium, DDT, dieldrin, PCBs, and toxaphene are localized COCs in the surface soil around the equipment barn.

The older parts of the golf course, on the west side of Red Clay Creek, are significantly more contaminated with arsenic than the newer parts.

Except for the PCBs at the equipment barn, which have been fully delineated, the soil contamination found on the site is associated with the storage and use of chemicals and equipment for maintenance of the golf course.

There is no significant contamination of groundwater or sediment at the Site.



Photo 1. Sixty years of active golf course maintenance left residual traces of fertilizer and pesticides in the soil of the tees, greens and some fairways.

The following environmental investigations were performed on the Hercules Road & Lancaster Pike Site:

1. 2009: BrightFields, Inc. conducted a Phase I Environmental Site Assessment. The Phase I found that because the use of the subject property as a farm, country club and golf course, the use of the adjacent property (Ashland Research Center) as an industrial research and development facility, and the presence of underground storage tanks at the subject Site and adjacent properties, the soil and/or groundwater may have been impacted by pesticides and petroleum products.
2. 2010: BrightFields collected 22 preliminary soil samples from the golf course greens and tee boxes to assess arsenic concentrations. All samples were chemically screened using BrightFields' Innov-X Alpha series X-Ray Fluorescence Analyzer (XRF). Based on the screening results, soil samples from nine greens were submitted to a commercial lab for confirmatory analysis of metals and a targeted list of chlorinated pesticides. The older course holes (those constructed in 1937, located west of the Red Clay Creek) had elevated concentrations of arsenic and other compounds in the soil, while the newer holes (those constructed around 1967, located east of the Red Clay Creek) did not have elevated concentrations of arsenic. This is consistent with the phase out of arsenic insecticides after World War II.
3. 2011: BrightFields conducted a Remedial Investigation (RI) of the Site. Arsenic, chlordane, heptachlor epoxide, and mercury are COCs in the surface soil in the former golf course playing areas (tees, fairways, and greens). Arsenic, barium, DDT, dieldrin, PCBs, and toxaphene are localized COCs in the surface soil around the equipment barn.

The soil sample results from the RI indicate that the soil at the greens associated with the 18 holes on the northern course sections contain elevated concentrations of arsenic and pesticides. The concentrations of arsenic found on the older greens (those developed circa 1937, located on the west side of the Red Clay Creek) are greater than the arsenic concentrations on the newer greens (those developed circa 1967, located on the east side of the Red Clay Creek). Upon further review of the data, the tees and fairways located on the older side of the Site also exhibit elevated levels of arsenic compared to expected background concentrations, while the tees and fairways of the newer side do not (with the exception of the fairway on Hole 5).

4. 2011: BrightFields conducted a Supplemental Soil Investigation to obtain sufficient analytical soil data, compliant with Delaware's Hazardous Substance Cleanup Act (HSCA) standard operating procedure, to evaluate whether the golf course fairways and tee boxes on the eastern portion of the Site require remediation. The investigation results confirmed that soil remediation is not required on the former golf course fairways and tee boxes located on the newer side of the Site (east of the Red Clay Creek) with the exception of the fairway on Hole 5.

### **What does the owner want to do at the Hercules Road & Lancaster Pike Site?**

Toll Brothers will develop the Site into multiple residential neighborhoods, which will include a total of 264 homes and consist of both single family and town home units. Redevelopment will include the construction of houses and the installation of utilities, streets, and landscaping. The Site redevelopment plan is depicted in Figure 2.

### **What remedial actions are proposed at the Hercules Road & Lancaster Pike Site?**

The objective of this Proposed Plan is to accommodate future residential use of the Site through a combination of soil excavation for off-site disposal and on-site soil blending. The selected method depends on the contaminant concentrations in the soil. The PCB containing soil under and around the equipment barn foundation will be excavated and removed for off-site disposal. The remediation areas are shown on Figure 3.

DNREC requires the following remedial actions be performed on the Hercules Road & Lancaster Pike Site:

1. The soil on the former golf course fairways and tee boxes on the older side of the Site (west of the Red Clay Creek) will be remediated through the blending of the shallow soil with deeper soil as required to accommodate future residential use. Soil samples will be taken and analyzed subsequent to the soil blending process to confirm that the appropriate blending depth was used to meet residential cleanup standards.
2. The soil on the fairway at Hole 5 will be remediated in the same manner as the fairways on the old side of the Site.
3. The soil on all of the former golf course greens across the Site will be remediated through soil excavation and removal. Field screening with an XRF in combination with confirmatory laboratory analysis will be utilized subsequent to the soil excavation and removal process to assess that the appropriate excavation depth was used to accommodate future residential use of the Site.
4. The Site developer will prepare a Site Specific Remedial Action Work Plan (RAWP), subject to DNREC approval, to address the specific methods to be used to remediate the Site.
5. The Site developer will prepare and implement a Contaminated Materials Management Plan (CMMP) to ensure that contaminated materials are appropriately managed and/or disposed off-site and a Health and Safety Plan for Site workers and the public during remedial activities. These plans and their implementation shall be subject to DNREC approval and oversight.

**What are the long-term stewardship requirements are proposed for the Hercules Road & Lancaster Pike Site?**

The Site will be redeveloped into a residential community after the cleanup. There will be no additional monitoring requirements. The Site will be eligible for a Certification of Completion of Remedy once the residential cleanup standards are achieved.

**How can I find additional information and/or comment on the Proposed Plan?**

The complete file on the Site, including the Environmental Site Assessment and the Brownfield Investigation report, is available at the DNREC office, 391 Lukens Drive in New Castle. Most documents are also found on:

<http://www.nav.dnrec.delaware.gov/DEN3/>

The public comment period begins on Wednesday, November 30, 2011, and ends at close of business (4:30 pm) on Tuesday, December 20, 2011. Please send written comments to the DNREC office or call Stephen Johnson, Project Manager, at: 302-395-2600.

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## Glossary of Terms Used in this Proposed Plan

<b>Contaminants of Concern (COC)</b>	These are potentially harmful substances at concentrations above acceptable levels (e.g. metals and PAHs).
<b>Certification of Completion of Remedy (COCR)</b>	A formal determination by the Secretary of DNREC that remedial activities required by the Final Plan of Remedial Action have been completed.
<b>Final Plan of Remedial Action</b>	DNREC's proposal for cleaning up a hazardous site after it has been reviewed by the public and finalized.
<b>Hazardous Substance Cleanup Act (HSCA)</b>	Delaware Code Title 7, Chapter 91. The law that enables DNREC to identify parties responsible for hazardous substances releases and requires cleanup with oversight of the Department.
<b>Proposed Plan of Remedial Action</b>	DNREC's initial plan for cleaning up a hazardous site, which is subject to public comment before being adopted as final.
<b>Remedial Investigation (RI)</b>	Thorough environmental study of a site which includes 1) sampling of site environmental media and/or wastes on the property and 2) conducting a preliminary risk assessment using the data collected to determine the risk posed to human health and the environment.

## **What is a *Proposed Plan*?**

A Proposed Plan of Remedial Action (Proposed Plan) is a summary of how DNREC plans to clean up a contaminated site. A Final Plan of Remedial Action (Final Plan) is the adoption of the Proposed Plan after all comments made by the public, within the comment period of twenty days, have been considered and addressed by DNREC.

The Delaware State Legislature passed the Hazardous Substance Cleanup Act (HSCA) in 1990. The Legislature made sure that members of the public would be informed about environmental problems in their own neighborhoods and have a chance to express their opinion concerning the cleanup of those environmental problems before DNREC takes action.

After DNREC studies a Site, it summarizes the problems there and proposes one or more possible solutions in a Proposed Plan. The Proposed Plan contains enough information to allow lay persons to understand the Site. More detailed information can be found in the reports and documents approved by DNREC. All of the documents and reports created by DNREC or consultants during the course of the investigation of the Site are available to the public at the offices of DNREC-SIRS or at DNREC's Delaware Environmental Navigator website:

<http://www.nav.dnrec.delaware.gov/DEN3/>

DNREC issues the Proposed Plan by advertising it in at least one newspaper in the county where the Site is located. The legal notices for the Proposed Plans and the Final Plans usually run on Wednesdays or Sundays in the legal classified section of the News Journal and/or the Delaware State News. The public comment period begins on the day (Wednesday), or the day after (Sunday) the newspaper publishes the legal notice for the Proposed Plan.

DNREC frequently holds public meetings during the comment period. Those meetings are usually held during a weekday evening, at a location near the Site. Citizens can request a public meeting if DNREC did not already schedule one.

The public may comment on the Proposed Plan by letter or email, or at the public meeting. DNREC considers all comments and questions from the public before the Proposed Plan is finalized and adopted as a Final Plan.

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