

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

**FINAL PLAN OF REMEDIAL ACTION**



**February 2005**

**Joe White Ball Park Site  
Wilmington, Delaware**

**DNREC Project No. DE-0299**

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This final plan of remedial action (final plan) presents the Department of Natural Resources and Environmental Control's (DNREC's) preferred cleanup alternative for the remediation at the Joe White Ball Park (site) in Wilmington, Delaware. The final plan is issued under the provisions of the Delaware Hazardous Substances Cleanup Act, 7 Del. C Chapter 91 (HSCA) and the Regulations Governing Hazardous Substance Cleanup (Regulations). As described in Section 12 of the Regulations, DNREC provided notice to the public and an opportunity for the public to comment on the proposed plan of remedial action (proposed plan). During the comment period of January 10, 2005 through January 31, 2005, DNREC did not receive any comments on the proposed plan; therefore the proposed plan has been adopted as the final plan. 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.

The final plan summarizes the Site Inspection (SI) report (March 2001), Remedial Investigation (RI) report (2003), Risk Assessment report (January 2004), the Remedial Alternatives Evaluation report (June 2004), and the administrative record file upon which this proposed remedy is based. Copies of these documents can be obtained or viewed at locations listed at the end of this document.

## **INTRODUCTION**

The Joe White Ball Park site is located on a city block in the northeast section of the city of Wilmington. The site is bound by the Vandever Avenue to the southwest, Thatcher Street to the northwest, 22<sup>nd</sup> Street to the northeast, and Northeast Boulevard to the southeast (Figure 1). The site is approximately 4.8 acres in size (*New Castle County, Tax Parcel No.2602940331*). The City of Wilmington, the current owner of the property entered into a Memorandum of

Agreement (MOA) with DNREC under the provisions of the Delaware Hazardous Substance Cleanup Act, 7 Del. C. Chapter 91 (HSCA). Under this agreement a Remedial Investigation (RI) was performed in July 2003. Subsequently a Risk assessment was performed in January 2004 by Avatar to investigate the potential risks posed to the public health, welfare, and the environment at the site by evaluating previous investigations performed at the site. A Remedial Alternatives Evaluation Study was performed by Tetra Tech in June 2004 to evaluate remedial alternatives for the site.

## SITE DESCRIPTION AND HISTORY

The Joe White Ball Park site was part of the William Thatcher estate. Historical maps review of the site showed that the site was primarily open land with little development in 1876, and that by the turn of the 20<sup>th</sup> century; the site had become partially surrounded by residential properties. A small stream was shown to be crossing the site in the 1876 map of the site and surrounding city but was not shown on any subsequent maps, indicating that fill material of unknown origin and nature have been placed on the site. The fill materials consist of historic municipal waste (garbage), ash and other material atop saprolitic soil. Currently the site includes a community ball field, a public walkway, some large trees, and large grass covered areas. The ball park is surrounded by a 4-foot high chain-link fence.

## INVESTIGATION RESULTS

Based on a review of all the environmental investigations conducted at the site including the RI and SI, several contaminants were detected in soil and groundwater above Delaware's unrestricted or restricted use Uniform Risk-based Standard (URS) values. Several contaminants were also detected in groundwater above URS. The investigation results are discussed below:

### SOIL

Analytical results indicated that several Polycyclic Aromatic Hydrocarbons (PAHs) and metals were detected in the surface and subsurface soil above their respective unrestricted or restricted use URS values. Contaminants that exceeded URS in the surface and subsurface soil at the site are shown in the following tables:

#### SURFACE SOIL

| <u>Contaminant</u>     | <u>RME<br/>Concentration*</u><br>(mg/kg) | <u>URS for<br/>Unrestricted Use</u><br>(mg/Kg) | <u>URS for<br/>Restricted Use</u><br>(mg/Kg) | <u>Default Natural<br/>Background<br/>Concentration (mg/kg)</u> |
|------------------------|------------------------------------------|------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------|
| <b>Organics</b>        |                                          |                                                |                                              |                                                                 |
| Benzo(a)anthracene     | 7.70                                     | 0.9                                            | 8                                            |                                                                 |
| Benzo(a)pyrene         | 7.00                                     | 0.09                                           | 0.8                                          |                                                                 |
| Benzo(b)fluoranthene   | 6.00                                     | 0.9                                            | 8                                            |                                                                 |
| Dibenz(a,h)anthracene  | 1.20                                     | 0.09                                           | 0.8                                          |                                                                 |
| Indeno(1,2,3-cd)pyrene | 4.00                                     | 0.9                                            | 8.0                                          |                                                                 |
| <b>Inorganics</b>      |                                          |                                                |                                              |                                                                 |
| Arsenic                | 28.1                                     | 0.4                                            | 4                                            | 11                                                              |
| Lead                   | 491.7                                    | 400                                            | 1000                                         | 30-100                                                          |

\*RME – Reasonable Maximum Exposure Concentration calculated as the 95% Upper Confidence Level (UCL) of the arithmetic mean of contaminants detected at the site

mg/kg – milligram per kilogram

## SUBSURFACE SOIL

| <u>Contaminant</u>     | <u>Maximum Concentration*</u><br><u>(mg/kg)</u> | <u>URS for Unrestricted Use</u><br><u>(mg/Kg)</u> | <u>URS for Restricted Use</u><br><u>(mg/Kg)</u> | <u>Default Natural Background Concentration (mg/kg)</u> |
|------------------------|-------------------------------------------------|---------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|
| <b>PAHs</b>            |                                                 |                                                   |                                                 |                                                         |
| Benzo(a)anthracene     | <b>38.0</b>                                     | 0.9                                               | 8.0                                             |                                                         |
| Benzo(a)pyrene         | <b>30.0</b>                                     | 0.09                                              | 0.8                                             |                                                         |
| Benzo(b)fluoranthene   | <b>25.0</b>                                     | 0.9                                               | 8.0                                             |                                                         |
| Dibenz(a,h)anthracene  | <b>2.70</b>                                     | 0.09                                              | 0.8                                             |                                                         |
| Indeno(1,2,3-cd)pyrene | <b>20.0</b>                                     | 0.9                                               | 8.0                                             |                                                         |
| <b>Metals</b>          |                                                 |                                                   |                                                 |                                                         |
| Arsenic                | <b>22.9</b>                                     | 0.4                                               | 4                                               | 11                                                      |
| Barium                 | <b>1680</b>                                     | 550                                               | 14000                                           | 40-80                                                   |
| Cadmium                | <b>8.9</b>                                      | 4                                                 | 100                                             | 1-3                                                     |
| Copper                 | <b>327</b>                                      | 310                                               | 8200                                            | 15-40                                                   |
| Iron                   | <b>60800</b>                                    | 2300                                              | 61000                                           | 3000-22000                                              |
| Manganese              | <b>778</b>                                      | 160                                               | 4100                                            | 60-350                                                  |
| Lead                   | <b>9420</b>                                     | 400                                               | 1000                                            | 30-100                                                  |
| Vanadium               | <b>118</b>                                      | 55                                                | 1400                                            | 15-40                                                   |

\*Maximum concentration detected

Subsurface soil concentrations are based on the finding of the Site Inspection report

## GROUNDWATER

Groundwater at the site contains contaminants of concern which include iron and manganese that exceed groundwater URS values. These groundwater URS values are Secondary Maximum Contaminant Levels (SMCLs), which are based on the aesthetic qualities of the groundwater such as taste, odor and color. In one well dieldrin, a pesticide, was detected at a level exceeding the Delaware's URS for groundwater. There were no VOCs, SVOCs, pesticides, or PCBs detected in any of the groundwater samples above their URS.

## GROUNDWATER

| <u>Contaminant</u> | <u>Maximum Concentration*</u><br><u>(ug/L)</u> | <u>Groundwater URS (ug/L)</u> |
|--------------------|------------------------------------------------|-------------------------------|
| Dieldrin           | <b>0.09</b>                                    | 0.004                         |
| Iron               | <b>25200</b>                                   | 300                           |
| Manganese          | <b>1750</b>                                    | 50                            |

\*Maximum concentration detected in groundwater

## SITE RISK EVALUATION

A site specific risk assessment was conducted to identify and evaluate the potential receptors and pathways of exposure to the media of concern based on the recreational use of the park which is open to the public. The primary source of risk to human health is the surface soil horizon (0-2 feet depth) present at the site. The risks associated with these soils are primarily from the potential exposure though ingestion and dermal contact of soils to arsenic, lead and PAHs. The potential cancer risk for age adjusted recreational visitor and construction worker exposures to the soil are 9.0E-05 and 1.0E-05 respectively. The cancer risk for the recreational visitor use

exceeds the acceptable risk of 1.0E-05. The non-cancer risk for recreation child visitor, adult visitor and worker exposures are hazard index (HI) of 0.537, and 0.059 and 0.018 respectively. The non-cancer risk does not exceed the acceptable risk of HI 1.0. The 95% Upper Confidence Level (UCL) of the arithmetic mean for lead was calculated as 491.7 mg/kg which slightly exceed unrestricted use URS value for lead of 400 mg/kg.

Risks to recreational visitors or city workers from the potential exposure to subsurface soil are unlikely because these properties are effectively managed by the City of Wilmington. DNREC would require a deed restriction and notification of DNREC if any deep excavations are being planned in these areas.

Iron and manganese detected in groundwater exceeded the Secondary Maximum Contaminant Levels (SMCLs), which are based on the aesthetic qualities of the groundwater such as taste, odor and color and does not present a human health risk. Dieldrin detected in one well exceed the groundwater URS, however, groundwater at the site is not being used and there is no receptor adjacent to the site. The site is within the city wide Groundwater Management Zone (GMZ) which prohibits the installation of any water wells on, or groundwater usage at the site without prior written approval of DNREC. An ecological assessment was conducted and concluded that there is no record of state-rare or federally listed species of plants, animal or natural communities at the site.

## REMEDIAL ACTION OBJECTIVES

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

- Prevent public and residential exposure to impacted soils and groundwater;
- Minimize potential exposure to site contaminants of concern for workers at the site;
- Restrict environmental degradation due to impacted soil and groundwater; and
- Prevent the use of groundwater for all purposes at the site.

These objectives are consistent with the City of Wilmington zoning policies, State Regulations governing water supply, worker health and safety, and HSCA.

Quantitative objectives define specific levels of remedial action to achieve protection of human health and the environment. Based on the qualitative objectives, the quantitative objectives will be used to ensure that future site users such as visitors and workers do not come in contact with soils that contain elevated levels of arsenic, lead, and PAHs.

Based on the qualitative objectives, the quantitative objectives are:

- Prevent human exposure to soil contaminated with arsenic to the health based concentration of 23 ppm for arsenic.
- Prevent human exposure to soil contaminated with PAHs that would result in a cancer risk above 1.0E-05 and a non-cancer risk above HI of 1.0
- Prevent human exposure to surface soil having a lead concentration greater than DNREC URS value for unrestricted use of 400 mg/kg.

## 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 study, DNREC determined that the following remedial actions be taken at the site:

1. Installation of one-foot clean soil protective barrier on top of a geo-textile demarcation fabric across the entire site. A remedial design providing details of the cap and the resulting storm water erosion control management plan shall be submitted for DNREC's review and approval prior to installation. The cover should be implemented in compliance with known applicable laws and regulations including the storm water/erosion control regulations.
2. A deed restriction shall be placed within ninety (90) days following DNREC's adoption of the final plan on the site prohibiting any land-disturbing activities including excavation, digging at the site without prior written approval of DNREC.
3. An Operation and Maintenance (O&M) Plan shall be established and implemented, detailing the procedures and practices including regular inspections to minimize the potential for disturbing the cap and to promote the long-term integrity of the cap. The O&M Plan shall be established within sixty (60) days following the installation of the remedy.
4. A Groundwater Management Zone (GMZ) is already in place for the City of Wilmington. The Joe White Ball Park site is within the City of Wilmington limits. The GMZ will prohibit the installation of any water wells on, or groundwater usage, at the site without prior written approval of DNREC. The existence of the GMZ and its requirements will be noted on the deed for the property.

The final plan includes remedial actions for groundwater based on the Department's best understanding of the current and anticipated future use of groundwater at or near the site. Groundwater is considered a valuable resource in the State of Delaware. Therefore, if the actual or potential future use of the groundwater resource at or near the site changes or if it becomes known that groundwater conditions result in an unacceptable risk to public health and/or the environment additional remedial actions shall be required.

## PUBLIC PARTICIPATION

The Department actively solicited written public comments and suggestions on the proposed plan of remedial action. The comment period began January 10, 2005, and ended on January 31, 2005. No comments were received. If you have any questions or concerns regarding the Christina Park site, or if you would like to view reports or other information regarding this site, please contact the project manager, Qazi Salahuddin, at 391 Lukens Drive, New Castle, Delaware 19720, or at 302.395.2600.

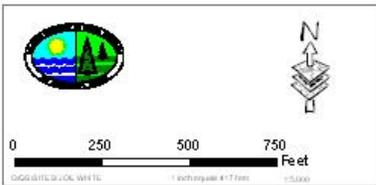
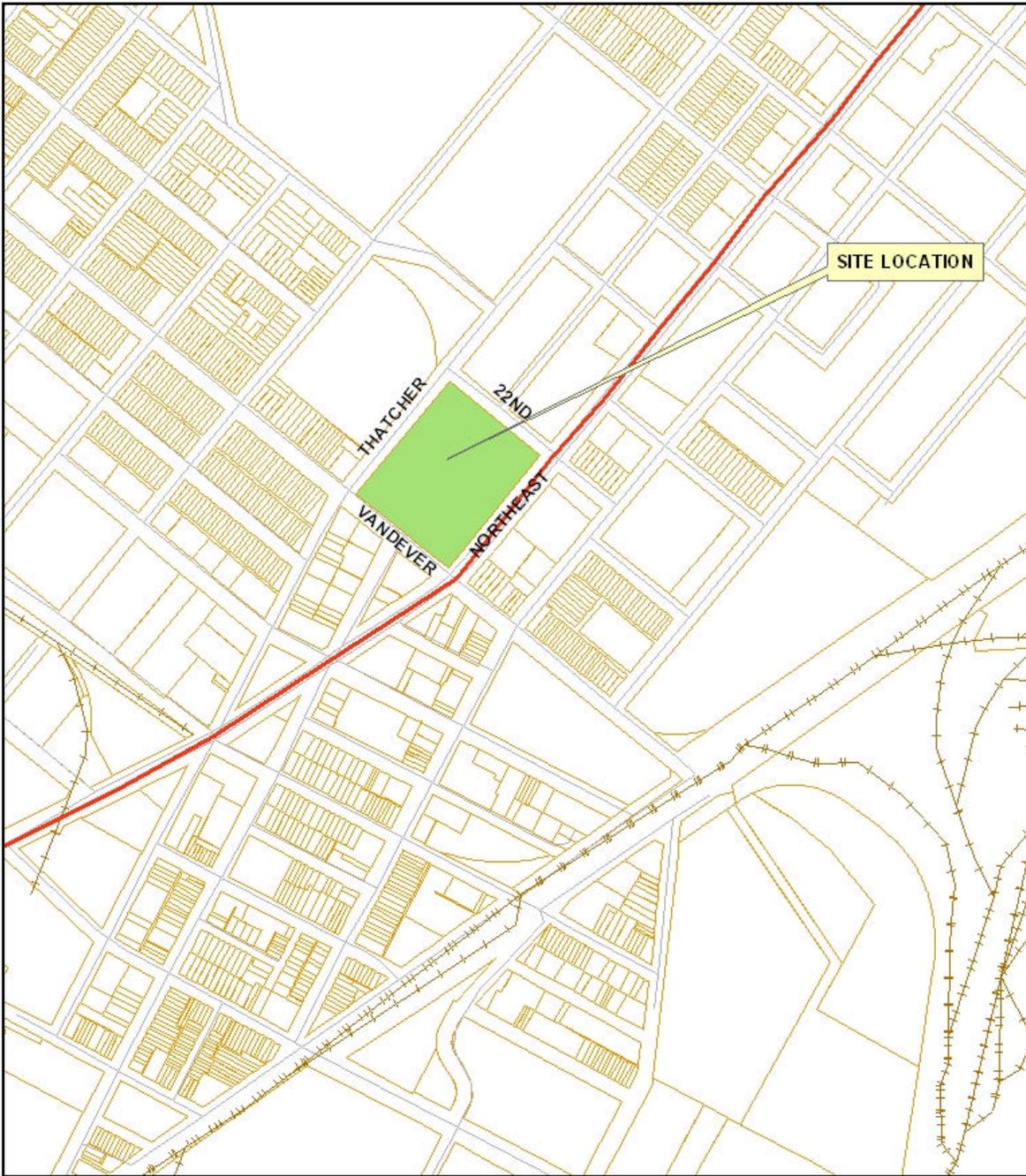
## DECLARATION

The final plan of remedial action for the Joe White Ball Park site is protective of human health, welfare and the environment, and is consistent with the requirements of the Delaware Hazardous Substance Cleanup Act.

*Marjorie A. Crofts*  
Marjorie A. Crofts, Acting Director  
Division of Air and Waste

*2/16/05*  
Date

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**FIGURE 1:**  
**JOE WHITE**  
**MEMORIAL BALL FIELD**  
**WILMINGTON, DELAWARE**