FINAL PLAN OF REMEDIAL ACTION

Delaware Children's Museum

550 Justison Street
Wilmington, Delaware

April 7, 2009
DNREC Project No. DE-1434

This Final Plan of Remedial Action (Final Plan) presents the Department of Natural Resources and Environmental Control's (DNREC's) requirements to address environmental contamination at the Delaware Children's Museum (Site).

DNREC issued public notice of the Revised Proposed Plan of Remedial Action (Proposed Plan) for the Site on March 11, 2009 and opened a 20-day public comment period. The Proposed Plan is attached. There were no comments or questions from the public. Therefore, the Proposed Plan is adopted as the Final Plan.

Final Plan will consist of the following requirements:

1. Hot spot removal activities as approved by DNREC – Impacted, exposed soils located within the landscaped areas shall be excavated to an approximate depth of 2-ft. bgs. In addition, raised planters that contain impacted soils shall be removed. The excavated soils shall be handled and disposed of in accordance with a DNREC approved Soil Management Plan (SMP).

2. In-situ Capping of Impacted Soils as approved by DNREC- All of the soils that are located within exposed portions of the patio area shall be excavated to 2-ft, replaced by certified "clean" fill material, and capped by concrete. All areas of the patio will be capped with either concrete or wooden decking to match adjacent surface material, depending on the planned re-use of the area. A marker fabric will be placed within each excavation prior to emplacement of fill material to identify and separate impacted soils and clean fill materials. The excavated soils shall be handled and disposed of in accordance with the DNREC approved SMP. Erosion and sediment control measures shall be implemented according to the O&M Plan.

3. Renovation of portions of the concrete patio – Portions of the concrete patio are in severe disrepair and will be further damaged during excavation of the impacted soil. The damaged

concrete also allows for infiltration of rainwater into potentially impacted soil which, if not repaired, could increase the mobility of contaminants from soil into groundwater and eventually surface water. Damaged concrete areas will be removed and/or repaired to improve the integrity of the existing cap. Soils exposed by the removal of the concrete will be excavated and handled and disposed of in accordance with a DNREC approved SMP. The exposed sections will be capped with concrete to match the existing grade of the patio area. Appropriate surface drainage will be constructed to accommodate the new concrete cap.

4. Environmental Covenant – DNREC requires the placement of a restrictive environmental covenant consistent with the Uniform Environmental Covenant Act (UECA), restricting future site development to non-residential uses and prohibiting excavation at the site without prior DNREC approval. Current and future owners of the property will be responsible for implementation of all aspects and costs of the approved remedy, including all requirements of the final plan, and adherence to the requirements and conditions established in the Uniform Environmental Covenant for the site. In addition, use of the sites groundwater will be restricted through the use of the existing City of Wilmington GMZ.

5. Remediation of LBP - Areas within the patron accessible portion of the building that will be developed for the DCM that contain LBP shall be remediated, enclosed, and/or encapsulated to support the re-use of the Site. The remediation measures for LBP shall be discussed in the O&M Plan.

6. Maintenance and monitoring of ACM - The roof and siding materials on the building were not included in the ACM survey but are assumed to contain ACM. These materials were not tested to confirm or negate the presence of ACM. These areas shall be remediated, and/or enclosed in accordance with the O&M Plan.

7. Development and implementation of a DNREC approved O&M Plan - An O&M Plan shall be developed and implemented to maintain the integrity of the in-situ capping of impacted soils. In addition, the O&M Plan will include a LBP and ACM inspection and maintenance program. The LBP program will be designed to minimize the generation of lead paint dust and/or chips that could potentially be exposed to DCM patrons and will be compatible with U.S. Environmental Protection Agency and U.S. Department of Housing and Urban Development (HUD) guidelines. The ACM program will be designed to minimize the disturbance of potential ACM that could potentially be exposed to DCM patrons and prevent exposure of potential ACM to museum patrons.

Approval:
This Final Plan meets the requirements of the Hazardous Substance Cleanup Act.

Kathleen M. Stiller 4/8/09

Kathleen Stiller Banning, Program Manager II
Site Investigation and Restoration Branch

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PROPOSED PLAN OF REMEDIAL ACTION

Delaware Children's Museum
(550 Justison Street Site)
Wilmington, New Castle County, Delaware
DNREC Project No. DE-1434

February 20, 2009

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

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PROPOSED PLAN OF REMEDIAL ACTION

550 Justison Street Site
Wilmington, New Castle County, Delaware
DNREC Project No. DE-1434

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

Approved by:

James D. Werner, Director
Division of Air & Waste Management

6 MAR 2009
Date

550 Justison Street Site

What is the 550 Justison Street Site? The Site is located at 550 Justison Street (formerly 550 Madison Street), in Wilmington, New Castle County, Delaware and is a certified Brownfield. The Site consists of approximately 6.65-acres and contains a high-bay metal building and office building, an exterior patio area constructed of wood and concrete, and associated parking and landscaped areas. The Site was previously utilized for industrial and commercial uses but is currently vacant. The Delaware Children's Museum (DCM), a non-profit organization, is interested in redeveloping the Site as a children's museum. The DCM plans to clean up the Site to unrestricted use criteria, which is the most protective level of cleanup, due to the planned future use a children's museum. Figures 1 and 2 present the Site Location and Site Layout. Figure 3 presents the proposed development plan. Site Photographs are attached.

Tax Parcel Numbers: 26-04900005
Address: 550 Justison Street, Wilmington, New Castle County, Delaware
Nearest major intersection: Justison Street and Beech Street
Area: 6.65-acres
Surrounding Property: Surrounding land use is commercial and residential
Zoning: 26W2 (Waterfront MFG/Commercial) and 26W4 (Waterfront Residential/Commercial)
Site Utilities: Water, sewer, and electric
Surface water: The Christina River **is** located along the eastern boundary of the Site

Topography: The Site is relatively flat and is approximately 6-ft. above mean sea level.
Groundwater: The water table in the unconfined surficial aquifer beneath the Site is found at depths between approximately 6 to 11-feet below ground surface (ft. bgs). Groundwater at the Site generally flows eastward toward the Christina River.

What happened at the 550 Justison Street Site? The Site is located in an area that has been in continuous industrial and commercial use since the late 18th century. The Site was historically part of a larger facility formerly known as the Dravo Shipyard, where ship building took place into the 1940s. In the 20th century, the building was used as a warehouse, as well as a machine, pipe, electric, and metal shop. Most recently, various tenants including the former Kahunaville Restaurant and Bar utilized the property. These redevelopment projects occurred in the 1980s and based on environmental reviews at that time as well as recently obtained environmental sampling data, there is no evidence of any historic risks from exposure to hazardous substances regulated under HSCA.

The land in the area was historically filled in stages with various fill materials that could have included soil, vegetation, river dredge spoils, coal ash, and possible general refuse.

Due to the past uses and placement of fill materials at the property and surrounding area, the Site contains residual concentrations of semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), and Metals.

What is the environmental problem at the 550 Justison Street Site?

SVOCs, Metals, and TPH were identified in soils at concentrations exceeding the unrestricted use criteria and are likely associated with the historic uses of the property and/or fill material. SVOCs and Dissolved Metals were identified in groundwater at concentrations exceeding the unrestricted criteria. The SVOCs in groundwater are likely associated with the historic use of the surrounding area and are not considered to be Site-related. Dissolved Metals in groundwater appear to be naturally occurring and likely represent background concentrations. Potential exposure to groundwater impacts are not a concern since the Site is located within a Groundwater Management Zone (GMZ) and thus the use of groundwater is restricted. Sampling of subsurface air beneath the building slab identified one VOC constituent (1,2,4-Trimethylbenzene) at a concentration exceeding the shallow soil gas criteria, but it was not detected in ambient air samples at concentrations exceeding the indoor air criteria. Lead based paint (LBP) was identified in building interior. Asbestos containing materials (ACM) may be present in the roofing and siding materials.

The following presents a summary of the contaminants of concern (COCs) that were identified by laboratory analysis at the Site:

Soils:

- SVOCs - Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Benzo (k) fluroanthene, Chrysene, Dibenzo (a,h) anthracene, Indeno (1,2,3-cd) pyrene, and Pyrene were identified at concentrations exceeding the unrestricted use criteria.
- Metals – Aluminum, Arsenic, Iron, Lead, and Manganese were identified at concentrations exceeding the unrestricted use criteria.
- TPH was detected.

Groundwater:

- SVOCs – Carbazole and Dibenzofuran were identified at concentrations exceeding the unrestricted use criteria.
- Dissolved Metals – Iron and Manganese were identified at concentrations exceeding the unrestricted use criteria.

Air:

- VOCs - 1,2,4-Trimethylbenzene was identified at a concentration exceeding the shallow gas criteria but was not detected in ambient air samples at concentrations exceeding the indoor air criteria.

Other:

- ACM were not identified at the Site within the materials tested. However, the roofing and siding materials on the building may contain ACM. These materials were not tested to confirm or negate the presence of ACM.
- LBP was identified on structural steel columns and associated roof trusses, steel anchor plates associated with wood columns, and decorative wood panels surrounding the Justison Street building entrance at the Site.

- Various potentially hazardous building materials were identified at the Site, including fluorescent light tubes, batteries, mercury switches, refrigeration units, transformers and smoke detectors. No transformers or ballasts containing Poly-chlorinated Biphenyls (PCBs) were identified.

A human health risk assessment was completed based on the redevelopment of the Site as a children's museum. Based on this redevelopment plan and an assessment of complete exposure pathways, a Site conceptual model was developed for a construction/utility worker, commercial worker (i.e. museum employee), museum visitor, and a museum groundskeeper for contact with Site soils (ingestion and/or dermal). Groundwater and subsurface air were not evaluated based on incomplete exposure pathways.

Based on the results of the baseline risk assessment using maximum exposure point concentrations (worst case exposure assumptions) and without site precautions/restrictions, potentially unacceptable carcinogenic risks associated with the potential ingestion and dermal contact with surface soils within the patio area were estimated for a construction/utility worker, museum employee, museum visitor, and groundskeeper. However, no potentially unacceptable carcinogenic risks were associated with the non-patio area under any of the exposure scenarios. These risks and hazards are driven primarily by SVOCs from a single surface soil sample location, HA-5.

Based on the results of the post-remediation risk assessment using maximum exposure point concentrations excluding HA-5, potentially unacceptable carcinogenic risks associated with the potential ingestion and dermal contact with surface soils within the patio area were estimated for a museum worker and groundskeeper. Acceptable risks were estimated for exposure to soils in landscaped areas outside of the patio area. The proposed remedies effectively mitigate the potential exposure of persons to impacted soils in the patio area.

What does the owner want to do at the 550 Justison Street Site?

The Site is currently unoccupied and owned by Harbor Associates. The proposed redevelopment plan is to develop the Site as a children's museum. Figure 3 presents the proposed Site redevelopment plan. The DCM plans to enter into a 10-year lease for the southern portion of the existing building, with the option to expand and utilize the remaining portions of the building if necessary.

The southeastern portion of the building will be utilized as an exhibition area. The southwestern portion of the building will be utilized as an education center with classrooms. The exterior areas (i.e. parking, landscaped areas, patio area) will be kept in their current functional condition, except for areas of the patio where repairs of the fire damage will be necessary or areas addressed in this Proposed Plan of Remedial Action (PPRA).

What clean-up actions have been taken at the former 550 Justison Street Site?

No interim actions have been completed at the Site.

What additional clean-up actions are needed at the former 550 Justison Street Site?

The proposed remedies at the Site to address Site impacts include hot spot soil removal, capping of impacted soils with associated repair of portions of the concrete patio, establishment of an environmental covenant for the Site, remediation/enclosure of LBP, maintenance and monitoring of ACM, and development and implementation of a Operations and Maintenance (O&M) Plan.

The following cleanup actions are proposed for the site:

1. Hot spot removal activities as approved by DNREC – Impacted, exposed soils located within the landscaped areas shall be excavated to an approximate depth of 2-ft. bgs. In addition, raised planters that contain impacted soils shall be removed. The excavated soils shall be handled and disposed of in accordance with a DNREC approved Soil Management Plan (SMP).

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Appropriate surface drainage will be constructed to accommodate the new concrete cap.

4. Environmental Covenant – DNREC requires the placement of a restrictive environmental covenant consistent with the Uniform Environmental Covenant Act (UECA), restricting future site development to non-residential uses and prohibiting excavation at the site without prior DNREC approval. Current and future owners of the property will be responsible for implementation of all aspects and costs of the approved remedy, including all requirements of the final plan, and adherence to the requirements and conditions established in the Uniform Environmental Covenant for the site. In addition, use of the sites groundwater will be restricted through the use of the existing City of Wilmington GMZ.

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What are the long term plans for the Site after the cleanup?

The long term plan for the Site after cleanup is to redevelop the Site as a children's museum. The O&M Plan will ensure that the remedial actions completed at the Site will remain protective of human health and the environment. The current and future owners of the Site shall be responsible for the implementation of the environmental covenant, all associated costs, including the actions and procedures incorporated into the O&M Plan.

DNREC plans to issue a Certificate of Completion of Remedy for the site after the completion of clean-up, the redevelopment of the property, and the implementation of the uniform environmental covenants at the site.

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

The complete file on the site including the Brownfields Investigation are available at the DNREC office, 391 Lukens Drive in New Castle. Most documents are also found on:

http://www.dnrec.state.de.us/dnrec2000/Divisions/AWM/sirb/

The 20-day public comment period begins on MARCH 11, 2009 and ends at close of business (4:30 pm) on MARCH 30, 2009. Please send written comments to the DNREC office or call Randy Wolfe, Project Manager, at: 302-395-2600.

Figure 1: Location Map

Figure 2 – Site Base Map

Figure 3: Proposed Site Redevelopment Plan

Site Photographs

Glossary of Terms
Used in this Proposed Plan

Brownfield	Property that is vacant or underutilized because of the perception or presence of an environmental problem.
Capping	Placement of a cover (cap) over contaminant-impacted media to contain the material and prevent exposure to persons and the environment.
Certified Brownfield	A brownfield that DNREC has determined is eligible for partial funding through the Delaware Brownfields Program.
Contaminant of Concern (COC)	These are potentially harmful substances at concentrations above acceptable levels (eg metals and PAH).
Certificate of Completion of Remedy (COCR)	A formal determination by the Secretary of DNREC that remedial activities required by the Final Plan of Remedial Action have been completed.
***Exposure**	Contact with a substance through inhalation, ingestion, or direct contact with the skin. Exposure may be short term (acute) or long term (chronic).
Final Plan of Remedial Action	DNREC's proposal for cleaning up a hazardous site after it has been reviewed by the public and finalized.
Hazardous Substance Cleanup Act (HSCA)	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.
Human Health Risk Assessment (HHRA)	An assessment done to characterize the potential human health risk associated with exposure* to site related chemicals.
Proposed Plan of Remedial Action	A plan for cleaning up a hazardous site submitted by DNREC and subject to public comments.
Risk	Likelihood or probability of injury, disease, or death.

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 clean up 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-SIRB or at DNREC's website:

http://www.dnrec.state.de.us/dnrec2000/Divisions/AWM/sirb/sitefiles.asp .

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 near the site in the evening. Citizens can request a public meeting if DNREC did not already schedule one.

Comments are collected at the public meetings, by phone or in writing. DNREC considers all comments and questions from the public before the Proposed Plan is finalized and adopted as a Final Plan.