**HDR Engineering, Inc.**

# Environmental Remediation Plan

## Sioux Falls Brownfield Pilot Project
## Sioux Falls, South Dakota

## July 2006

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# PREFACE

The Brownfield redevelopment project area was formerly occupied by a recycling and salvage enterprise, a railroad roundhouse and a commercial building materials business. Redevelopment of the area includes converting part of the site into a recreational park, constructing a roadway between the downtown area and the Falls Park expansion area, and creating and expanding private redevelopment sites.

Three documents have been developed to address the requirements of Brownfield remediation. The first is the Environmental Remediation Plan. This document was developed to familiarize contractors involved in construction projects with characterization activities that have occurred on the site, health and safety requirements for construction activities and the activities and requirements of the remediation contractor. Although a number of different contaminants were identified at the site, the predominant contaminant was lead. These other contaminants are typically collocated with lead. As a result, a risk-based cleanup concentration of 1,000 mg/kg lead was established for this site. This concentration was based on proposed remediation and construction activities as well as future uses of the site. Prior to beginning construction activities for Phillips Avenue, Central Main Sanitary Sewer Replacement and the Fourth Avenue Storm Sewer, sampling was performed that included grid sampling and linear sampling. Based on the sampling effort, known areas of contamination will be removed prior to beginning these other projects.

The second document is the "Phillips Avenue – 5$^{th}$ Street to Falls Park Drive, Site Remediation Drawings and Specifications." The drawings and specifications provide the requirements that must be complete by the Remediation Contractor to remediate the site. The work includes but is not limited to: developing site operation and other plans, securing the site, excavation and disposal of debris and soils, placement of contaminated soils on the recreational park area and installation of an engineered capping system over the contaminated soils.

The third document is the "Future Activities Management Plan." This plan will provide health and safety requirements for future construction and maintenance activities and proposed institutional controls to manage future risks.

The Remediation Contractor is responsible for disposing all debris, soil and material from the site. Coordination with other contractors at the site is critical to implementation of the site remediation and construction of other improvements. Prior to other contractors beginning their work, the Remediation Contractor will be responsible for remediating known areas of contamination. As construction of other projects at the site proceeds, areas of unknown contamination may be discovered. These contractors will transport the contaminated material to a staging area provided by the Remediation Contractor. The Remediation Contractor will be responsible for properly disposing of this material.

# 1.0 INTRODUCTION

## 1.1 General

The City of Sioux Falls, South Dakota, is planning to redevelop a parcel of land located along the west bank of the Big Sioux River at the north edge of downtown (see Figure 1-1). The Sioux Falls Brownfield pilot project includes a former salvage operation, a brickyard, South Dakota State Rail Authority trackage and lands, and public access to the riverbank. This redevelopment project is designed to achieve three main goals: 1) create a public park and recreation area on the land, 2) expand and improve transportation between downtown and the park area, and 3) create/expand private redevelopment sites in an area adjacent to the park.

Projects that have been identified and are on going that will ultimately need to be completed to realize the redevelopment of the Brownfield Site as currently envisioned are as follows:

- Central Main Sanitary Sewer Replacement
- Fourth Avenue Parallel Storm Sewer
- Phillips Avenue Extension to Falls Park
- Brownfield Site Remediation
- Railroad Relocation
- Expanded Falls Park Development
- Adjacent Site Development Guidelines
- I-29 Brickyard Demolition and Environmental Assessment

This Environmental Remediation Plan (ERP) summarizes the site remediation activities proposed by the City of Sioux Falls for the Sioux Falls Brownfield Pilot Project. The contents of this Plan have been developed based on discussions between the City of Sioux Falls and representatives from the South Dakota Department of Environment and Natural Resources (SD DENR), the South Dakota Rail Authority and the U.S. Environmental Protection Agency (USEPA). This Plan focuses on the technical aspects of the proposed remedial activities for which SD DENR and USEPA review and approval is required.

On August 20, 2004, U.S. EPA awarded a Brownfield Clean Up Cooperative Agreement (No. BF97811701) to provide the City with the financial assistance needed for the clean up of the site. Under BF97811701 Agreement, the City would receive financial assistance, from U.S. EPA; in the amount of $200,000 for portions of the proposed clean up. An administrative record for this cooperative agreement has been established and maintained by the office of Planning and Building Services of the City of Sioux Falls. A copy of this cooperative agreement and progress reports are included in Attachment E of this report.

Note that various implementation components of the remedial activities presented in this Plan may be subject to future modification prior to and/or during execution of the remedial activities. Modifications may occur as a result of field conditions (actual versus anticipated), project sequencing and logistics, availability of key equipment and materials, and other related changes that will allow for improvement upon the overall project performance, efficiencies, and schedule.

## 1.2 Overview of Proposed Remedial Activities

The proposed future use of the site includes two distinct land uses (see Figures 1-2 and 1-3). A portion of the site will be developed into a public park (referred to in this and other documents relating to this Brownfield pilot project as the "recreational park area") and the remainder of the site will include a road corridor and will be used for creation and expansion of private redevelopment sites (referred to in this and other documents relating to this Brownfield pilot project as the "redevelopment/corridor area"). Section 2.2 provides further detail on the proposed site land use.

A Brownfield Site Assessment (BSA) was conducted in 2002 to characterize known conditions at the site, gather information on potential chemical contamination, and determine if health risk to humans or ecological receptors will be of concern in the proposed development plan. Results of the BSA are summarized in Section 2.3 and are documented in the *Brownfield Site Assessment, Final Site Characterization Report* (HDR, 2003). Recommendations for remedial measures in the recreational park area and redevelopment/corridor area were included in the BSA based on the environmental data collected at the site through the characterization activities.

Representatives from SD DENR and USEPA reviewed the recommendations presented in the BSA. In an evaluation report prepared for USEPA regarding the adequacy of the BSA, it was concluded that the proposed remedial measures would be protective of human health and the environment and exposure pathways of potential concern will be either incomplete or controlled by the establishment of appropriate institutional controls (SRC, 2003).[1] The recommended remedial measures listed in the BSA are summarized in the following subsections. Sections 3.0 and 4.0 of this document present the scope, design, and implementation of the remedial action, incorporating these recommended remedial measures.

### 1.2.1 Recreational Park Area

Surface and subsurface soil sampling conducted in the recreational park area indicates that polyaromatic hydrocarbons (PAHs), metal contaminants, and methylene chloride are

[1] The BSA did not evaluate the potential exposure pathway of inhalation of volatiles released from subsurface soil or groundwater into indoor air at businesses in the redevelopment/corridor area. In the SRC evaluation, screening level inhalation risks to commercial workers in the redevelopment/corridor area were evaluated, and it was concluded that the vapor intrusion pathway is not likely to be of concern for the release of chemicals from groundwater or subsurface soils into indoor air (SRC, 2003).

present at concentrations above screening levels developed for this area of the site. Recommended remedial measures to address these contaminants are placement of an engineered cap over the area and the use of institutional controls to mitigate potential surface and subsurface exposures.

1. **Implementation of an engineered cap over the recreational park area**
   As described in the redevelopment plan (Big Muddy Workshop, Inc., 1998) and the updated Falls Park West and North Phillips Avenue Master Plan (presented to and approved by the City of Sioux Falls Parks and Recreation Department in July 2003), the recreational park area between the railroad tracks and the Big Sioux River will be covered with a nominal 12-inch low permeability layer of clay followed by a minimum 18-inch layer of soil. The compaction and testing requirements for the clay layer is specified in Section 2200 of the Site Remediation Drawings and Specifications. In some areas, the grading could include as much as 3 to 4 feet of topsoil. Grading will mainly be to provide a walkway system similar to that in Falls Park and to correct surface drainage problems or to regrade slopes to allow for easier ground maintenance. All fill material used above the low permeability layer will be clean fill. The majority of the recreational park area will be revegetated with either native or turf grasses including species of shallow rooted trees and shrubs reviewed and approved by SD DENR.

   Installation of the low permeability cap and placement of additional fill and vegetation will preclude direct contact and significantly reduce potential inhalation exposures to recreational users and terrestrial species. In addition, the described cap features will reduce the amount of surface water that will infiltrate into subsurface soils and thereby reduce any driving force for the PAH and metal contaminants (which are relatively immobile in nature to begin with) as well as methylene chloride to infiltrate/leach through the subsurface to groundwater.

2. **Use of institutional controls to mitigate potential future subsurface exposures**
   Although subsurface work in the recreational park area is not anticipated based on the proposed land use, the City will implement construction management procedures for any subsurface work that is required that will ensure all workers are adequately informed of site risks if subsurface work is ever necessary. The construction management procedures will be described in the Post Remediation Institutional Controls document described in the preface of the ERP.

### 1.2.2 Redevelopment/Corridor Area

Surface and subsurface soil sampling conducted within the redevelopment/corridor area (RC) indicate that PAHs, polychlorinated biphenyls (PCBs), various volatile organic compounds (VOCs), and metal contaminants are present at concentrations above screening levels developed for this area of the site. No constituents were detected above groundwater screening criteria. Recommended remedial measures to address the contaminants present consist of removal of a minimum of 1 to 2 feet of soil in select

areas of this portion of the site and the use of institutional controls to mitigate potential surface and subsurface exposures.

1. **Removal of contaminated material along the corridor**
   Due to the widespread nature and location of contaminants detected, it is recommended that a minimum of 1 to 2 feet of material throughout much of the RC be removed. This remedial action will also remove contaminants currently present in surface and shallow subsurface soils that could infiltrate/leach to groundwater.

   A risk-based site specific screening level (SSSL) was calculated for lead to provide a lead concentration that could be left in place without creating an undue risk to people visiting the site and exposed to soil. This concentration was calculated to be 1,000 mg/kg lead. In the RC any soils left in place that exceed 1,000 mg/kg lead will be covered by a minimum of two feet of soil. Soils less than 1,000 mg/kg lead can be left in place. The Site Remediation Drawings and Specifications identify areas of soil removal.

   Within the Phillips Avenue road alignment, the remediation contractor will remove soil to the roadway subbase elevation. This will minimize the need for the paving contractor to train workers to meet OSHA health and safety training requirements. Utility contractors that might encounter unforeseen conditions must have workers trained for OSHA health and safety training requirements.

2. **Use of institutional controls to mitigate potential subsurface exposures**
   Although contaminants other than lead (which will be addressed via the recommended soil removal measures discussed previously) were not detected above construction worker soil screening levels (SSLs) in subsurface soils, institutional controls for future subsurface activities in the redevelopment/corridor area are still recommended. Because there is potential for contamination to be present in areas not sampled during the BSA activities, the City will implement construction management procedures that will ensure all workers are adequately informed of site risks for all necessary subsurface work. The construction management procedures will be described in the Post Remediation Institutional Controls document described in the preface of the ERP.

## 1.3 Documents Associated with the Brownfield Pilot Project

Several documents have been prepared in association with the Brownfield pilot project and additional documents will be developed as the project progresses. Table 1 provides a summary of documents associated with the project and a brief description of each.

**Table 1-1**
**Documents Completed to Date**

| Document Title | Document Date | Document Author | Document Description |
|---|---|---|---|
| *Phillips to the Falls, A Brownfields Redevelopment Plan* (Redevelopment Plan) | Feb 1998 | Big Muddy Workshop, Inc. | Document was prepared for Mayor Gary Hanson to provide an overview of proposed land use for the site area. |
| *Sampling and Analysis Plan/Quality Assurance Project Plan* (SAP/QAPP)<br>SAP/QAPP Addendum 1<br>SAP/QAPP Addendum 2 | Aug 2001<br>Jan 2003<br>Dec 2003 | HDR Engineering, Inc. in association with Leggette, Brashears, & Graham, Inc. | Document was prepared to guide the sampling and analysis efforts required to characterize the site. |
| *Brownfield Site Assessment, Final Site Characterization Report* (BSA) | Mar 2003 | HDR Engineering, Inc. in association with Leggette, Brashears, & Graham, Inc. | Document was prepared to summarize characterization activities conducted and recommended measures to address site contaminants. |
| *Phillips Avenue, 5th Street to Falls Park Drive* | Feb 2004 | Stockwell Engineers, Inc. | Drawings and specifications for the construction of Phillips Avenue including miscellaneous utilities and 4th Avenue Storm Sewer construction. |
| *Environmental Remediation Plan* (ERP) | Feb 2004 | HDR Engineering, Inc. | Document was prepared to provide a summary of proposed site remedial activities. |
| *Site Remediation Drawings and Specifications* | Feb 2004 | HDR Engineering, Inc. | Drawings and specifications were prepared to provide contractor requirements for site remedial activities. |
| *Central Main Sanitary Sewer Replacement* | Mar 2004 | HDR Engineering, Inc. | Drawings and specifications for the construction of the central main sanitary sewer replacement through Falls Park. |

The following subsections describe documents that will be completed as the project progresses.

### 1.3.1 Soil Removal Drawings and Specifications

Drawings and specifications for the soil removal activities have been prepared for bidding purposes and are titled "Phillips Avenue, 5th Street to Falls Park Drive, Site Remediation Drawings and Specifications." The excavation drawings and specifications detail the soil to be excavated, quality control provisions, and testing procedures to complete the desired remediation effort. The specifications will include: excavation, soil screening criteria, standards for soil (on-site storage, treatment, and/or disposal), soil and debris separation, waste placement, fill placement, capping, and decontamination. The

drawings include: the excavation limits, general cross sections, soil staging areas and disposal areas, decontamination areas, clean access areas and capping details.

### 1.3.2 Public Involvement Plan

Once the City, SD DENR, and USEPA approve the soil removal drawings and specifications, the Contractor selection process will begin. Prior to remediation, HDR will develop a public relations program that will inform the public of the current status and what the City is proposing for final site cleanup of the Phillips to the Falls project and will provide a forum for public review.

### 1.3.3 Future Activities Management Plan

Section 6.0 of this document serves as a Future Activities Management Plan and summarizes the institutional controls (ICs) and procedures that will be established for prevention of exposure to environmental concerns during construction activities and normal activities at the site.

### 1.3.4 Contractor Documents

Once a contractor is identified, the successful contractor will prepare a series of submittals to support the performance of the required remedial activities. Included in these submittals to the City will be a Site Operations Plan, a Health and Safety Plan (HASP), and other information concerning the materials, products, and procedures to be incorporated into the remedial activities. These submittals will serve several purposes, including, but not limited to, a demonstration of the contractor's overall understanding of the project scope and requirements and the contractor's proposed approach, sequence, and schedule for carrying out the remedial activities as well as qualified personnel and personal protective equipment (PPE) procedures.

### 1.3.5 Final Overview and Site Closure Report

To document decisions and remediation activities at the site, HDR will develop a report that documents the activities associated with remediation of the site, ultimate disposition of contaminated materials and the development of institutional controls. The Final Overview and Site Closure Report will include details regarding the waste characterization on-site vs. off-site characterization results and volume of waste or materials excavated, removed and placed, treated or disposed.

# 2.0 SITE DESCRIPTION AND BACKGROUND

## 2.1 General

This section provides a description of the proposed site land use and a summary of past site characterization activities. Information presented in this section was obtained from the BSA (HDR, 2003).

## 2.2 Site Overview

The redevelopment plan includes converting part of the site into a recreational park, constructing a roadway between the downtown area and the Falls Park expansion area, and creating and expanding private redevelopment sites. Complete details of the proposed plan are available in the Falls Park West and North Phillips Avenue Master Plan (presented to and approved by the City of Sioux Falls Parks and Recreation Department in July 2003).

The plan includes the development of public park facilities, replacement of sprawling rail switching yards with a single rail throughway, extension of a 14-mile River Greenway recreational path, and the creation and expansion of some private redevelopment sites. Public park facilities will include the land east of North Phillips Avenue to the river and the existing Burlington Northern/Santa Fe railroad storage line (see Recreational Park Area designated in Figure 1-2).

The new railroad corridor, creating a single rail throughway, will be located along the North Phillips Avenue extension for most of its length and will include a grade-separated crossing of the road and rail (see Redevelopment/Corridor Area designated in Figure 1-3). A 50-foot right of way is anticipated for the new rail line. The right of way will include an attractive groundcover.

Expansion of redevelopment sites will occur in the area west of the Phillips Avenue extension. The intent of the revitalization area is to create opportunities for private real estate investment that expand or enhance the land uses of the adjacent Central Business District. The anticipated commercial development in the redevelopment/corridor area includes offices, specialty retail, restaurants, and other service-type businesses. It is also anticipated that the City will need to provide public facilities such as parking and sidewalks in the area.

## 2.3 Summary of Brownfield Site Assessment

As stated in Section 1.2, a BSA was conducted in 2002 to characterize environmental conditions on-site by assessing the presence, type, and magnitude of potential site

contamination. Results of the BSA (HDR, 2003) are summarized in the following subsections.

Site characterization samples consisted of surface and subsurface soil samples, groundwater samples, and Quality Assurance/Quality Control (QA/QC) samples. Sampling locations were selected based on a review of historical land uses and the results of preliminary environmental investigations. Samples were analyzed for organic compounds and inorganic analytes using USEPA-recognized analytical methods.

Soil sampling results were compared with site-specific SSLs, which were developed for the site areas based on the proposed future land uses. The development of the SSLs is described in the *Sampling and Analysis/Quality Assurance Project Plan (SAP/QAPP)* (HDR, 2001). Groundwater sampling results were compared with either South Dakota Groundwater Quality Standards (SDGWQSs) or, for chemicals with no SDGWQSs, federal Maximum Contaminant Levels (MCLs).

### 2.3.1 Recreational Park Area

Surface and subsurface soil samples in the recreational park area were located at potential source areas based on information on past site activities (see the BSA). Surface soil samples were collected in the recreational park area to determine if the planned capping features (a nominal 12-inch clay layer followed by 18 inches to 4 feet of topsoil and vegetation) would be adequate to preclude potential exposure through the surface soil pathways. Constituents detected above recreational user and/or construction worker SSLs were PAHs, arsenic, and lead. The physical and chemical properties of the constituents detected in the surface soils were assessed in relation to their mobility considering the cap features. Based on the types and concentrations of constituents detected, there is minimal potential for volatilization through the cap features or potential for infiltration/leaching to the subsurface. As such, the cap will preclude exposure from the identified surface soils pathways in the recreational park area.

Subsurface soil samples were collected to determine if there is a potential for construction worker exposure or a potential for contamination to infiltrate/leach to groundwater. Subsurface samples were collected and analyzed for metals, Total Petroleum Hydrocarbons (TPH), VOCs and semi-volatile organic compounds (SVOCs) at 10 locations from depths of 2 and 5 feet below ground surface (bgs) at each location. In addition, at one of the 10 locations a sample was collected from 8 feet bgs and analyzed for these same parameters. Metals and TPH were not detected above construction worker or groundwater migration SSLs at any of the sampling locations.

SSLs were exceeded for PAHs at RP-SB-09 at the 5-foot depth. Historic aerial photographs indicate that this area was used for storage of railroad ties. There were no PAHs detected above SSLs at this location from the surface level or from the 2-foot depth. In addition, there were no PAHs detected above SSLs from any of the other nine subsurface sampling locations in this area of the site.

The concentrations of PAHs detected are within one order of magnitude of the SSLs. Due to the relative immobility of PAHs in the subsurface and the fact that a low permeability cap (a nominal 12-inch clay layer followed by 18 inches to 4 feet of topsoil and vegetation) will be placed over this area of the site, leaching of these contaminants to groundwater is not likely due to risk evaluations/calculations.

Methylene chloride exceeds the groundwater migration SSLs at two locations, RP-SB-07 and RP-SB-08. At sampling location RP-SB-07, samples were collected at 2 and 5 feet bgs. The concentration detected at RP-SB-07 at the 5-foot depth exceeds the groundwater migration SSLs; however, this concentration is an estimated value due to laboratory quality control criteria not being met. Methylene chloride was not detected above the groundwater migration SSLs at RP-SB-07 at a depth of 2 feet bgs. At sampling location RP-SB-08, samples were collected at 2, 5, and 8 feet bgs. Although methlyene chloride was detected above the groundwater migration SSLs in the 2-foot sample, methylene chloride in samples from RP-SB-08 at the 5- and 8-foot depths were not above the groundwater migration SSLs. Placement of the cap (a nominal 12-inch clay layer followed by 18 inches to 4 feet of topsoil and vegetation) will inhibit the downward migration of recharge and subsequent leaching of these low methylene chloride detections to groundwater.

Besides placement of the cap and the City's use of institutional controls for any potential subsurface activities in the park area, no other remedial measures are recommended for the recreational park area. Some of the soils excavated from the RC and other areas within the RP may be placed below the cap.

### 2.3.2 Redevelopment/Corridor Area

Transect sampling was selected for soil sampling in the redevelopment/corridor area of the site. Surface and subsurface soil samples were collected throughout the entire redevelopment/corridor area along transect lines across the area, spaced approximately 200 feet apart across each transect (see the BSA). Direct-push groundwater sampling was conducted at three locations in the vicinity of the proposed Phillips Avenue alignment. The sample locations were established based on the planned excavation activities in this area for construction of Phillips Avenue.

The planned future use for this area of the site is for a utility corridor and small businesses. Surface soil sampling was conducted to determine if there is a potential for unacceptable exposure to contaminants or a potential for contaminants to migrate to the subsurface and reach groundwater at unacceptable concentrations.

In surface soils, occupational user SSLs are exceeded for arsenic, lead, and benzo(a)pyrene at various locations across this area of the site. Groundwater migration SSLs are exceeded for PCBs, two PAHs, arsenic, lead, chromium, mercury, selenium, methylene chloride, tetrachloroethene, and trichloroethene. Due to the widespread nature

and location of contaminants detected, it is recommended that contaminated material along this corridor be removed. The actual areas for soil and material removal were defined by additional grid sampling that was conducted in December 2003 and January 2004. The horizontal and vertical extent of soil removal is identified on the Site Remediation Drawings and Specification.

Subsurface soil sampling was conducted to determine if there is a potential for construction worker exposure or a potential for contamination to infiltrate/leach to groundwater. Subsurface samples were collected and analyzed for metals, TPH, VOCs and SVOCs at 14 locations from depths of 2 and 5 feet bgs at each location. In addition, at five of the 14 locations a sample was collected from 8 feet bgs and analyzed for these same parameters. TPH was not detected above construction worker or groundwater migration SSLs at any of the sampling locations.

Lead is the only constituent detected in subsurface soil samples above construction worker SSLs. Recommended removal activities to address surface soil contamination in the redevelopment/corridor area will address the most significant of these detections, in particular, lead at RC-SB-13 at the 2-foot depth.

Even though no other constituents were detected in subsurface soils at concentrations greater than the construction worker SSLs, institutional controls are still recommenced in this area to preclude construction worker exposure to potential contaminants in locations that may not have been sampled. As with subsurface activities in the recreational park area, the City will be responsible for implementing construction management procedures for any subsurface work that is required.

The procedures may require workers to wear personal protective equipment such as chemical resistant clothing, gloves, and boots in all operations. Attachments A and B describe the health and safety requirements to be implemented during remediation. The procedures will be governed by Subpart E of the Occupational Safety and Health Administration (OSHA) regulations contained in Title 29 Code of Federal Regulations (CFR) Part 1926, which specifies the use, selection, and maintenance of personal protective equipment. Implementation of these measures will minimize any potential risks to any PAH and metal contaminants left in subsurface soils in this area of the site.

Groundwater migration SSLs are exceeded for benzo(a)pyrene, benzo(a)anthracene, chromium, mercury, and methylene chloride. Due to the immobile nature of the PAHs and metals and the fact that these constituents were all detected within one order of magnitude of the SSLs, groundwater migration potential is not considered a significant concern for these constituents. Nearly all of the methylene chloride results were flagged as estimated quantities due to laboratory control criteria not being met, and all estimated results are only slightly above the groundwater migration SSLs. As such, groundwater migration potential is not considered a significant concern for this constituent.

Groundwater sampling was conducted in the corridor area at locations where excavation activities will be required as per the redevelopment plan (see the BSA). Samples were

analyzed for VOCs, SVOCs, and total Resource Conservation and Recovery Act (RCRA) metals. No VOCs or SVOCs were detected above SDGWQSs or MCLs. Three metals were detected at concentrations exceeding SDGWQSs. Because the metals results were for total metals and the SDGWQSs for metals are based on the dissolved portion of the constituents, additional groundwater sampling was conducted to collect dissolved metals data. Groundwater samples were collected in the same vicinity of the original sampling locations. The samples were field filtered and submitted to an analytical laboratory for dissolved metals analysis. None of the dissolved metals results exceeded the SDGWQSs.

Because no constituents were detected in groundwater at concentrations exceeding SDGWQSs or MCLs, no further action is necessary for site groundwater. The recommended remedial measure to address surface and significant subsurface soil contamination in the RC is to remove soils above 1,000 mg/kg lead to a depth of two feet below final finished grade. The City's use of institutional controls for any potential subsurface activities in the redevelopment/corridor area is the recommended remedial measure for remaining constituents in subsurface soils (i.e., constituents present below the 2-foot depth).

# 3.0 REMEDIAL ACTION SCOPE AND DESIGN

## 3.1 General

This section of the ERP summarizes the cleanup objectives and related information concerning the proposed remedial activities, with an emphasis on determination of estimated horizontal and vertical limits of soil removal from the property, and the related design assumptions and supporting rationale. Subsequently, Section 4.0 of this Remediation Plan provides general information concerning the anticipated implementation of the proposed soil removal and a description of ancillary activities necessary to facilitate and support such activities.

## 3.2 Recreational Park Area – Placement of an Engineered Cap

As discussed in Section 2.3.1, remedial measures planned for the recreational park area consist of placement of capping features and the use of institutional controls to preclude exposure to subsurface contaminants. There are two sewer projects, (1) the realignment and expansion of the central main sanitary sewer and (2) the completion of the Fourth Avenue parallel storm sewer, which will be completed within the park area concurrently with the remedial activities. The Fourth Avenue parallel storm sewer involves carrying a portion of storm water above a 25 year event over land down Fourth Avenue, across Phillips Avenue and across Falls Park South to the Big Sioux River. These two sewer projects are being coordinated with the park area remedial activities.

The capping concept for this area of the site was first developed in the *Phillips to the Falls, A Brownfields Redevelopment Plan,* prepared by the Big Muddy Workshop, Inc., for Mayor Gary Hanson (February 1998)[2]. The physical and chemical properties of constituents detected in surface soil samples collected during the BSA in the recreational park area were evaluated relative to their mobility considering the cap features proposed in the Big Muddy Workshop's 1998 redevelopment plan.

Surface and subsurface soil sampling conducted during the BSA did not indicate the presence of significant contamination in the recreational park area. In the BSA, it was concluded that placement of the cap will be a sufficient measure to address contaminants that were detected. The cap will serve two purposes: 1) it will preclude exposure to contaminants left in place or deposited in this area from other areas of the Brownfield site, and 2) it will reduce the amount of surface water that will infiltrate into the subsurface (thereby reducing the driving force for the migration of contaminants downward to the groundwater).

Complete details of the cap design and specifications for the materials to be used and installation requirements are included in the Site Remediation drawings and

[2] Note that the City of Sioux Falls adopted the Phillips to the Falls Brownfield Redevelopment Plan in Resolution 21-98 on February 2, 1998.

specifications. The cap will be placed in the area to the east of Phillips Avenue and the Big Sioux River. The cap contours will be designed to allow proper drainage and ensure water does not pool above the low permeability clay layer. Grading of the cap will mainly be used to provide a walkway system similar to that in Falls Park and to correct surface drainage problems or to regrade slopes to allow for easier ground maintenance. All fill material used above the low permeability layer will be clean fill rather than cutting and excavation.

Prior to placement of the cap, a small area within this portion of the site will be excavated near the falls to enhance the view for a scenic overlook. The area to be excavated is shown in the Site Remediation Drawings and Specifications. The excavation activities for this area of the park will be completed in conjunction with the excavation activities required to address soil contamination in the redevelopment/corridor area. Final disposition of materials excavated from this location will be handled in the same manner as proposed for the redevelopment/corridor area.

The majority of the recreational park area will be revegetated with either native or turf grasses and approved shallow rooted trees and shrubs. Irrigation of the grass will be possible. Trees with roots shallow enough to not penetrate the clay layer have been approved by SD DENR. Provisions will be included in the drawings and specifications for foundations and other fixtures that may penetrate the cap.

Section 6.2 discusses the City's construction management program that will be used to protect workers conducting any future subsurface work in the recreational park area. Section 6.4 of this document describes the institutional control measures that will be put in place by the City with regard to maintaining cap integrity.

## 3.3 Redevelopment/Corridor Area – Excavation Activities

During the BSA, surface and subsurface soil sampling was conducted along the corridor of the planned Phillips Avenue extension. Groundwater sampling was conducted at locations in the vicinity of the proposed Phillips Avenue alignment to evaluate potential construction worker contact with groundwater during excavation for utilities. As summarized in Section 2.3.2, no contaminants were detected above screening in groundwater, but various contaminants were detected in soils above screening levels.

The recommended remedial measure to address the soil contamination is excavation. Soil or material above 1,000 mg/kg lead will be excavated to depth of two feet below final grade. Clean fill or in the case of Phillips Avenue, granular subbase and concrete may be used to reach final grade. The Site Remediation Drawings and Specifications show the areas within the redevelopment/corridor area at which excavation activities will be conducted. Some of the excavated soil will be placed below the cap in the park area.

## 3.4 Cleanup Objectives and Disposal Criteria

Contaminants targeted for removal in the redevelopment/corridor area are metals (lead, chromium, and arsenic), PCBs, and PAHs present in surface and shallow subsurface soils. The primary contaminant present in this area of the site is lead. Excavation activities to address this contamination are based on grid sampling performed in the RC prior to developing the excavation drawings. The removal actions proposed for the lead contamination will also address the other constituents present in various locations along these portions of the corridor area. (Note that construction worker screening levels for these other constituents (PCBs, PAHs, chromium, and arsenic) were not exceeded in subsurface soils.)

Objectives of the soil removal activities in the redevelopment/corridor area are to remove contaminated soils between the surface and two feet below finished grade in accordance with a risk based cleanup standard developed specifically for this site. Using EPA guidance, a site-specific remediation goal of 1,000 mg/kg has been developed and will be used as the lead cleanup criterion for soil and material in the RC.

Disposition alternatives for soils excavated from the redevelopment/corridor area include landfill disposal and use as beneficial fill below the park area cap (see Section 4.0 for a detailed evaluation of these alternatives). Excavated contaminated soil has to meet certain criteria before disposal to landfills is allowed. Disposal criteria are based on Toxicity Characteristic Leaching Procedure (TCLP) limits. For lead, the TCLP limit is 5 mg/L. Soils exceeding the TCLP limit of 5 mg/L are considered hazardous waste and must be disposed in a landfill that is in compliance with Subtitle C of RCRA or treated and reclassified as non-hazardous. Soils that do not exhibit hazardous waste characteristics (i.e., those with TCLP results less than 5 mg/L) are considered non-hazardous waste and can be disposed in a municipal landfill. Section 4.0 describes the disposal alternatives.

The Site Remediation Drawings and Specifications identify areas within the Recreational Park and Redevelopment/Corridor where excavation activities will occur. Based on details provided in the drawings and specifications, an estimated initial volume of 42,000 cubic yards of soil and debris will be excavated from the site. Debris will be disposed of in the City's construction and debris landfill. Approximately half of the soil will be placed under the park cap, the rest will be tested and disposed of or treated and disposed of in an appropriate landfill. Estimated volumes of material from the various phases of construction are listed below.

| | |
|---|---|
| Phase 1 – Pull Back Area: | 10,000 c.y. debris and 2,000 c.y. soil |
| Phase 2 – Central Main: | 200 c.y. |
| Phase 3 – 4$^{th}$ Street Storm Sewer: | 150 c.y. |
| Phase 4 – Phillips Avenue: | 28,000 c.y. |
| General Surface Debris: | 2,000 c.y. |
| Total Soil and Debris: | 42,350 c.y. |

# 4.0 SOIL AND DEBRIS DISPOSITION ALTERNATIVES

## 4.1 General

This section describes the disposition alternatives that are applicable for the site soils subject to excavation, including the disposition location (i.e., off-site landfill disposal, re-use as beneficial fill in the recreational park area, etc.) and limitations regarding each alternative. Prior to removal from the site, soils will sampled for TCLP lead to establish whether the materials excavated exhibit the characteristic of a hazardous waste. Based on this determination, the applicable landfill disposal and treatment options (Subtitle C versus Subtitle D) will be evaluated.

## 4.2 Soil Disposal

Prior to excavation, soils to be excavated from the site will be divided into grids, then samples will be collected and analyzed with an XRF to determine lead concentrations. (Complete details of the sampling are provided in Addendum 2 to the Sampling and Analysis Plan/Quality Assurance Project Plan (SAP/QAPP) (December 2003).) Once removed, the excavated soils will be placed in stockpiles established based on the XRF results. From the stockpiles, soils can either be taken off-site or placed in an area of contamination beneath the RP cap.

- Soils with lead concentrations below 100 mg/kg (using the XRF) will be considered to be below the 5 mg/L TCLP level for lead. These soils will be considered non-hazardous waste and can also be used off-site at locations other than the landfill, if additional characterization is performed to confirm that it does not contain contaminant levels of concern.. Additionally, samples may be tested for total lead and TCLP lead and compared to XRF values to see if a correlation could be developed with respect to the 100 mg/kg Pb level. If the correlation can be developed, the 100 mg/kg Pb level could be raised to a higher concentration.

### 4.2.1 Disposal On-Site as Beneficial Fill

Any excavated material within the Brownfield site can be placed under the cap on-site without further testing. Only material that exceeds 100 mg/kg Pb and is taken off-site will be tested for the characteristics of a hazardous waste. Material testing less than 100 mg/kg Pb could be treated as clean fill and used on-site. This material can also be used off-site at locations other than the landfill, if additional characterization is performed to confirm that it does not contain contaminant levels of concern.

In a review of the BSA conducted for the USEPA, it was concluded that use of the soils excavated from the redevelopment/corridor area as beneficial fill in the recreational park area under the low permeability clay cap would be acceptable. It was stated in the review

that this was a reasonable use of the soils, as the clay layer would prevent exposure by direct contact pathways (SRC, 2003).

An estimated volume of 14,000 cubic yard is available for placement of fill material beneath the cap in the recreational park area. If the volume of excavated soil is too great to fit underneath the cap, the excess soils that have been determined to be non-hazardous will be disposed at the Sioux Falls solid waste landfill.

### 4.2.2 Disposal at a Subtitle D Landfill

Non-hazardous soil and asbestos-containing materials (ACM) not left in place or used as beneficial fill within the recreational park area will be disposed at the Sioux Falls Regional Sanitary Landfill. ACM shall be handled, packaged, labeled, transported and disposed of in accordance with all local, state and federal laws and regulations. Prior to shipment to the sanitary landfill, approval will be obtained from the City's Public Works Landfill Manager. Documentation of testing needed for approval (such as TCLP results) will be coordinated with the landfill manager.

### 4.2.3 Disposal at a Subtitle C Landfill

In accordance with RCRA land disposal restrictions, soil that is hazardous due to the lead toxicity characteristic (exceeds 5 mg/L when subjected to TCLP analysis) cannot be placed in an ordinary solid waste landfill. If sampling results indicate the soils are hazardous, alternatives for disposal in a hazardous waste landfill will be evaluated. Costs associated with hazardous waste disposal can exceed ordinary landfill costs by 10 to 100 times. As such, if sampling results indicate large quantities of the excavated soils are hazardous, stabilization and treatment alternatives will be evaluated as a means to reduce disposal costs.

### 4.2.4 Treatment of Hazardous Materials

Stabilization and solidification technology involves adding ingredients to contaminated soils that coat the soil grains and/or fill inter-granular pore spaces, permanently sealing off the lead contamination from the environment. This technology immobilizes contaminants in the soil and results in a solid or granular material. If the stabilized soil mixture does not exceed the hazardous waste threshold as determined by TCLP testing, it may be possible to dispose of it in an ordinary solid waste landfill. No soil was treated prior to off site disposal as part of this project.

## 4.3 Debris Disposal

Within the Recreational Park area, a significant amount of rock and debris (an estimated volume of 10,000 cubic yards) will be removed near the falls to enhance the view for a scenic overlook. Soils will be separated from the debris and disposed as described in Section 4.2. The debris will be stockpiled for subsequent disposal at the Sioux Falls Landfill. Both the RP and RC areas contain concrete foundations and other debris that

must be removed prior to remediation, an additional 2,000 cubic yards is estimated for this material. Additionally, rock may be excavated during utility construction. Surface debris and rock removal shall be stockpiled in the same area. Concrete debris from previous demolition activities was tested for TCLP lead. The debris did not exhibit the toxic characteristic for lead.

To facilitate access to the soils subject to removal, any existing vegetation may be removed from the site. All material cleared from above-grade (e.g., trees/shrubs/branches) will be handled in a manner that will prevent contact with soils subject to excavation. The Public Works Landfill Manager should designate appropriate placement and disposal of debris at the Sioux Falls Landfill.

# 5.0 REMEDIAL ACTION IMPLEMENTATION

## 5.1 General

The information presented in Sections 3.0 and 4.0 of this Remediation Plan focused on the objectives and selection of the proposed remedial activities by first establishing removal action objectives and then identifying the soil removal limits necessary to achieve those objectives. This section of the Plan provides information concerning the various activities associated with implementing the proposed remedial activities.

The overall contents of this section of the Plan are general in nature and potentially subject to modification prior to or during the performance of the proposed remedial activities.

Once a contractor is identified, the successful contractor will prepare a series of submittals to support the performance of the required remedial activities. Included in these submittals to the City will be a Site Operations Plan, a HASP (see Attachment B), and other information concerning the materials, products, and procedures to be incorporated into the remedial activities. These submittals serve several purposes, including, but not limited to, a demonstration of the contractor's overall qualifications, understanding of the project scope and requirements and the contractor's proposed approach, sequence, and schedule for carrying out the remedial activities.

## 5.2 Project Organization and Roles

During the course of conducting the remedial activities at the site, several different agencies/organizations will be involved, with the role of each depending on the particular aspect of the project. This section identifies the agencies and organizations expected to be involved with this project and their associated roles and responsibilities. Included is a listing of key personnel, descriptions of duties, and lines of authority during the remedial activities as the site.

### 5.2.1 City of Sioux Falls

The City is responsible for the overall implementation and oversight of the project.

### 5.2.2 South Dakota Department of Environment and Natural Resources

SD DENR serves as the lead regulatory agency for this project.

### 5.2.3 U.S. Environmental Protection Agency

USEPA will assist in reviewing and overseeing the various activities associated with the remedial activities.

### 5.2.4 Supervising Contractor

HDR will serve as the City's supervising contractor to assist in the overall management of the remedial activities. Responsibilities of the supervising contractor include, but are not limited to, the following:

- Review various submittals provided by the Contractor;
- Provide on-site observation of the remedial activities;
- Provide documentation of the remedial activities;
- Provide technical assistance/issue resolution related to the implementation of the remedial activities;
- Implement monitoring activities prior to, during, and following removal/restoration activities;
- Assist the City in verifying that the remedial activities are complete and performed in accordance with this Plan; and
- Prepare and submit the Final Completion Report summarizing removal/restoration activities.

HDR will use subconsultants/subcontractors as needed to fulfill these responsibilities.

### 5.2.5 Contractors

The City will select one or more contractors to perform the activities associated with these remedial actions. The primary role of the Remediation Contractor will be to implement the activities outlined in this Plan and provide all labor, materials, equipment, and services necessary to complete the remedial activities. Additionally, the Contractor will participate in construction progress meetings to address the project status, schedule, test results, observations and findings, technical issues, design changes, and upcoming activities.

## 5.3 Training Requirements

All personnel performing on-site activities shall have completed applicable training in accordance and compliance with 29 CFR 1926.65(e) (see Attachment B, Section B.6). Personnel engaged in hazardous substance removal or other activities, which expose or potentially expose them to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off-site, and 3 days of supervised field experience. Such personnel may include equipment operators, general laborers, and supervisory personnel completing excavation activities, activities associated with placement and maintenance of utility corridors, and other site activities requiring soil cutting and grading.

Personnel who perform limited activities at the Site (defined in 29 CFR 1926.65(e)(3)(ii) and (iii)) and are not potentially exposed to contaminant levels above permissible

exposure limits shall receive a minimum of 24 hours of instruction off-site, and 1 day of supervised field experience.

Following completion of removal activities, specialized training for site workers will not be necessary (including those performing activities such as landscaping and paving).

## 5.4 Pre-Mobilization Activities

Subsequent to the submittal of the ERP and prior to the initiation of on-site activities at the site, a number of pre-mobilization activities will be conducted. Concurrent with Agency review of the ERP, the City will perform activities toward the selection of a contractor to conduct the remedial activities. Included in this effort will be the preparation of a Request for Proposal (including technical drawings and specifications), a pre-bid meeting and site visit with prospective contractors, receipt and analysis of contractor proposals, and the identification of and contracting with the selected contractor. Following selection, the Remediation Contractor will be required to prepare and submit to the City for review several documents, which will include, but will not be limited to, the following:

- Health and Safety Plan;
- Site Operations Plan;
- Work schedule;
- A summary of materials and procedures to be used;
- Names, locations, and quantities of proposed backfill materials; and
- Name(s) of subcontractor(s) to be used for the project.

Collectively, the above submittals are intended to demonstrate that the contractor: 1) has an adequate understanding of the scope of the remedial activities; 2) has developed a project sequence that can efficiently perform all on-site activities within the allowable schedule; 3) will utilize acceptable materials, products, and procedures; and 4) will perform all activities in a manner that is protective of on-site workers and the surrounding community. Two of the submittals identified above—the HASP and the Site Operations Plan—are discussed in more detail below.

The contractor selected to perform the remedial activities will be required to implement a project-specific HASP. This project-specific HASP must meet the requirements established in 29 CFR 1910 and 1926. The plan must address those activities scheduled to be undertaken by the contractor and present required information including, but not limited to, training, identification of key personnel (including the contractor's Health and Safety Officer), medical surveillance, site hazards, work zones, personal safety equipment and protective clothing, personal air monitoring, equipment cleaning, and material safety data sheets.

In addition to the preparation of the HASP by the contractor, any other contractors or subcontractors to either the City or the primary contractor will be responsible for

developing and implementing a task-specific worker HASP. The same requirements/provisions referenced above regarding the HASP will be addressed in each task-specific plan.

The purpose of the Site Operations Plan will be to summarize the materials, procedures, timelines, and controls that the Contractor intends to utilize during removal activities. This plan will be prepared in consultation with the City and its supervising contractor and will address, but not be limited to, the following items:

- Detailed work schedule;
- Excavation Plan;
- Materials Handling and Staging Plan;
- Equipment cleaning procedures;
- List of equipment to be used on-site;
- Necessary permits;
- Property protection procedures; and
- Dust control measures.

Separate from the coordination activities and project-related submittals described above, the City will conduct one or more project kick-off meetings with personnel from SD DENR and USEPA. The intent of these meetings will be to discuss the anticipated project sequence and schedule; present any modifications to the remedial activities as presented in this Plan; summarize the health, safety, contingency, and security measures that will be implemented and maintained during the remedial activities; and discuss specific questions and concerns identified by the meeting attendees.

## 5.5 Site Preparation Activities

Several activities will be performed prior to the initiation of intrusive soil removal activities. These activities include initial site survey and layout; site controls and access; contractor mobilization; utility clearances and relocation; erosion and sedimentation control measures; removal and disposal of surface vegetation and other surface features; and preparation (as needed) of necessary support areas related to the remedial activities, including equipment and soil staging areas, and temporary access roads. The general scope of each of these activities is provided below.

### 5.5.1 Surveying and Site Layout

Survey control will play a vital role in the performance, monitoring, and confirmation of the proposed remedial activities. Surveying shall be performed by a registered surveyor in the State of South Dakota. Prior to the commencement of soil removal activities, a detailed site survey will be conducted. Included in this survey activity will be the following:

- Re-establishment of the existing survey control and baseline information;
- General layout of the anticipated site operations (e.g., staging areas, removal areas);
- Locations of above- and below-grade utilities and site features that may be affected by the subsequent remedial activities; and
- Initial horizontal limits of soil removal and sub-areas therein based on various staging/consolidation considerations.
- The horizontal and vertical placement of final excavated soils, beneath the RP cap, must be surveyed.

### 5.5.2 Site Controls and Access

Currently, vehicular and pedestrian access to the site is limited. During the performance of the remedial activities, additional security measures and procedures will be used to restrict unauthorized access, minimize disruptions, and to promote a safe work environment. The anticipated security measures are further discussed below.

**Temporary Fencing** - The existing perimeter fence currently in place to minimize access to the site will be maintained and will be supplemented by temporary construction fencing to delineate and secure areas of the ongoing remedial activities. Such fencing would be constructed of high density polyethylene, at least 4 feet in height, adequately and securely installed, and with a high visibility color (other fencing configurations of equivalent performance may be considered).

- **Surveillance During Remediation** - During the remedial activities, it is anticipated that all on-site personnel will provide ongoing surveillance and alert appropriate personnel in the event that potential security issues are identified.
- **Sign In/Out Sheet** - For the duration of the remedial activities, a sign in/out sheet will be maintained for the site. All project personnel and site visitors will be required to sign in upon entering the site and sign out upon leaving.
- **Implementation of Safe Work Practices** - Implementation of safe work practices will provide for additional site security during the remedial activities. Such practices will include the following:
  - Maintaining temporary construction fencing around all open excavations and other potentially dangerous areas;
  - Parking heavy equipment in a designated area each night and removing keys;
  - Maintaining an organized work area, including proper storage of all tools and equipment; and
  - Conducting a security review and check at the conclusion of each day.

### 5.5.3 Contractor Mobilization

Prior to the start of the on-site response actions, the contractor will mobilize the appropriate personnel, subcontractors, equipment, and materials to the site. The mobilization of these items may occur in phases or as needed based on the specific purpose and timing of their use. All materials, equipment, etc., brought onto the site will be located in an area that will not interfere with subsequent remedial activities.

### 5.5.4 Utility Clearances and Relocation

Underground and aboveground utilities that could potentially be affected by the proposed remedial activities will be identified prior to the start of the remedial activities. Additionally, as indicated in Section 5.4.1, a detailed site survey will be performed by the Remediation Contractor prior to the commencement of soil excavations to confirm/locate subsurface utilities at the site that may be affected by the soil removal actions.

Details regarding utility-related precautions will be identified by the City and its contractors and will be incorporated into the Site Operations Plan. As necessary, the City will communicate its plan for protecting, re-routing, etc., the affected utilities to the appropriate organizations (other City departments and/or utility companies).

### 5.5.5 Erosion and Sedimentation Control Measures

During the performance of soil removal actions, various measures will be implemented, monitored, and maintained to minimize the potential for migration of contaminants in the soils via rainfall runoff/runon, airborne pathways (i.e., windblown dust), or mechanical transport (i.e., soil tracking on transport vehicles). Several of these measures are related to the contractor's activities (and related monitoring) during the performance of the remedial activities. However, certain activities will be performed as part of overall site preparation activities. These include erosion control measures (discussed below) and construction of soil staging/stockpile areas (see Section 5.5.6). The Remediation Contractor is responsible for complying with SD DENR rules and permits concerning Construction Activity Erosion and Sediment Control, and Chapter 12 (Erosion Control) of the City of Sioux Falls Engineering Design Standards for Public Improvements.

Erosion and sedimentation control best management practices (BMPs) will be designed and implemented to prevent erosion of exposed soils and subsequent accumulation of materials in site drainage pathways. In addition, these measures would be used to divert rainfall runoff from contacting any soil stockpile areas and/or entering work areas and open excavations. The selection of specific erosion control measures for the remedial activities will depend on the scope of activities, site topography, type of existing ground cover, and maintenance considerations.

There are many BMPs that may be utilized, depending on the situation. BMPs include limiting certain construction activities and installing control structures such as siltation fences, staked hay bales, sediment traps, diversion trenches/berms, and inlet protection. These measures would be maintained for the duration of site activities until such time that restoration activities have provided a final vegetative cover in all areas. During this time, erosion controls will be inspected on a regular basis and maintained as necessary.

<u>Siltation Fences</u>
Siltation fences are utilized to divert and/or limit the velocities of overland flow and flow in drainage channels. Siltation fences consist of a geotextile fabric material suspended

between support posts and anchored to the ground. A wire mesh fence may also be installed on the downgradient side of the fabric to provide support. As surface water approaches the siltation fence, it is either diverted around downgradient areas or filtered through the fabric material, depending upon the orientation and intent of the siltation fence. When utilized as a diversion method, the siltation fence limits the amount of surface water that contacts downstream areas. When utilized as a filter, the siltation fence limits the velocity and the amount of suspended materials in the runoff water, thus limiting the downstream transport of soils.

Staked Hay Bales

Similar to siltation fences, staked hay bales minimize velocities associated with overland flow. Hay bales limit the velocity of the flow and provide filtration to minimize the downgradient migration of suspended soils. Hay bales may be installed around the perimeter(s) of work areas and soil stockpile areas as required and would be secured to the existing ground surface by wooden stakes.

Diversion Trenches/Berms

Diversion trenches and/or berms are another means of diverting surface water runoff around soil stockpiles and excavation areas. In this case, surface soils would be removed and stockpiled immediately upgradient and adjacent to the area from which it was removed (alternatively, clean off-site soils may be utilized to create an earthen berm). This provides a means for intercepting and diverting runoff before it contacts downgradient areas. If necessary, diversion trenches and berms would be supplemented by the use of staked hay bales or siltation fencing. Diversion trenches would be constructed in such a way as to minimize the flow velocity in the trench to avoid scouring of the trench soils.

### 5.5.6 Construction and Use of Soil Staging Areas

During the course of performing the soil removal activities (and related handling, consolidation, etc.) described in the ERP, temporary stockpiling and staging of excavated soils will likely be needed. Placement of materials into a stockpile area prior to their final disposition is anticipated for the following reasons:

- Nonhazardous excavated soils may be staged to allow their re-use as backfill materials;
- Soil stockpiling may be beneficial and appropriate to allow coordination between soil removal and soil transport activities;
- Excavated soils may be stockpiled to allow sampling and analysis activities prior to disposition or treatment;
- Clean material from an off-site location may be brought onto the site to facilitate backfilling/restoration activities.

The location and specific construction of temporary soil staging areas will depend on specific circumstances. However, certain provisions will apply to any stockpile/staging

area to minimize the potential for soil migration due to wind- and rainfall-related factors, such as:

- Staging areas will not be established in locations that may interfere with the remedial activities or related traffic flow. In addition, the location of any staging area will consider site topography and avoid (to the extent possible) possible rainfall drainage areas;
- Staging areas will not be established in or near water courses or drainage ditches;
- To minimize potential erosion and migration issues, only a manageable volume of soil will be included in a given staging area;
- Except when soils are actively being placed or loaded, a properly anchored impermeable membrane will continuously cover the staged materials. This membrane will be maintained for the duration of soil staging activities. The Remediation Contractor can submit alternate methods of dust control for approval;
- Erosion and sedimentation control measures (e.g., staked hay bales, silt fencing, diversion trenches, earthen berms) will be utilized; and
- Staging areas will be inspected daily and any noted deficiencies will be promptly addressed.

### 5.5.7 Removal and Disposal of Vegetation and Other Surface Features

To facilitate access to the soils subject to removal, existing vegetation may be removed from the site. All material cleared from above-grade (e.g., trees/shrubs/branches) will be handled in a manner that will prevent contact with soils subject to excavation. The Public Works Landfill Manager shall determine appropriate placement and disposition of materials at the Sioux Falls Landfill from this site.

## 5.6 Soil Excavation and Handling

This section summarizes some of the activities involved in the removal, handling, and final disposition of soil excavated as part of the remedial activities. Although a general overview is provided herein, the City and its contractors will develop the sequencing of excavation activities (and related efforts) in more detail prior to the initiation of the remedial activities.

### 5.6.1 Soil Excavation

Drawings and specifications for the soil excavation and remediation activities. In addition to the drawings and specifications, the Remediation Contractor will be required to develop a Site Operations Plan, which is to identify the procedures, equipment, sequencing, and manpower necessary to perform the soil removal. Factors that will need to be considered by the Remediation Contractor in developing the Site Operations Plan include the soil removal limits discussed in Section 3.5, as well as the following:

- The need for and time involved with conducting various survey activities to identify, monitor, and verify the proposed removal limits;
- The sequencing of excavation activities to facilitate the concurrent placement and compaction of backfill and other restoration activities for other contractors working on the site;
- Protection of existing utilities or, alternatively, the abandonment and temporary replacement of such utilities; and
- Provisions for on-site stockpiling and staging in lieu of direct soil loading into transport vehicles.

### 5.6.2 Material Handling

As soils are excavated, they will be placed in stockpiles (established based on XRF lead results as discussed in Section 3.3). To minimize the potential for soil migration due to wind- and rainfall-related factors, the stockpiles and any open excavations will be protected with a cover (e.g., polyethylene sheeting) and anchored when the area is not actively being used. Finally, if concerns regarding airborne dust are identified or suspected, provisions will be implemented to keep the stockpiles and open excavation moist using a water spray application. Other alternatives for dust control can be submitted by the Remediation Contractor for approval.

### 5.6.3 Disposition of Excavated Materials

As previously summarized, there are several potential disposition scenarios for the soils excavated for the site, including on-site staging for re-use as backfill material and off-site transport and disposal. Information provided in the Site Remediation Drawings and Specifications describes the various areas and depths subject to these disposition scenarios, and Section 4.0 of the ERP describes the criteria associated with each of these scenarios.

The Site Operations Plan to be developed by the Remediation Contractor will identify the logistics involved in the transport and handling of excavated soils prior to their final disposition. In the event that off-site transport to a Subtitle C landfill and disposal of materials excavated from the site is necessary, the Remediation Contractor will coordinate such activities to ensure compliance with all applicable federal and state regulations. Vehicles transporting hazardous materials over public roads will be appropriately tarped, manifested, and placarded in accordance with appropriate federal RCRA and Department of Transportation (DOT) requirements, as well as any equivalent state requirements.

### 5.6.4 Water in the Excavation

If water is encountered, the Contractor shall dewater the excavation. Water removed from the excavation will be placed in tanks and upon completion of any testing required by the City, the water may be required to be treated prior to approval for discharge to the City's sanitary or storm sewer. If free product is encountered, the product shall be

captured and placed in temporary storage tanks. Disposal of the tank contents will be coordinated with the City.

### 5.6.5 Air Monitoring/Sampling

While current data does not indicate that excessive or unhealthful concentrations of volatile organics are present in subsurface soils, the Remediation Contractor will provide a PID onsite, to be used daily to scan newly uncovered subsurface soils, especially those that present a stained appearance or yield an odor. The PID will read off in units roughly equivalent to parts per million, but will not positively identify the specific organic vapor "species" of chemical present. Assuming the chemical to be benzene, a prudent rule of thumb is to prevent employee inhalation exposure to any unknown organic vapor, if the air concentration remains greater than 5 ppm for greater than 5 minutes. The Contractor's HASP (see Attachment B) shall make provisions for organic vapor monitoring.

During all on-site activities, including those of other contractors, that could potentially produce dust (e.g., air-borne soil or lead particulate) , the Remediation Contractor will be responsible for making visual assessment of dust levels, and to control the emission of dust through administrative and engineering controls (see Section 5.6.6). If visible dust above background levels is present, an air-monitoring program for particulates will be conducted to assess potential impacts to ambient air due to these activities and the need for dust control measures.

Based on soil sampling data from the BSA, a site-wide air monitoring program for lead is not warranted. Using the following formula, the maximum lead soil concentration from the BSA sampling was utilized to generate a dust concentration, in mg per cubic meter of air ($mg/m^3$), that would result in a contaminant concentration exceeding the lead time-weighted average regulatory limit (OSHA Action Level (AL)) of 0.03 $mg/m^3$. The resultant value is presented in Table 5-1 in the column, *"Dust Levels w/Potential for Over Exposure"*.

$$\frac{\text{PEL/TLV (mg chemical/m}^3\text{ air)}}{\text{Max Detected Soil Conc. (mg chemical/kg soil (ppm))}} \times \frac{\text{Conversion Factor (1,000,000 mg soil / 1 kg soil)}}{} = \text{Dust Level That Will Result In Exposure at PEL/TLV (mg soil/m}^3\text{ air)}$$

**Table 5-1**
**Dust Level Needed for an Overexposure to Lead**

| Contaminant | Maximum Soil Concentration (mg/kg) | (Used as a conservative baseline) OSHA AL ($mg/m^3$) | (For reference only)[3] OSHA PEL & ACGIH TLV ($mg/m^3$) | Dust Level w/ Potential for Over Exposure (mg soil/$m^3$ air) |
|---|---|---|---|---|
| Lead | 25,000 | 0.03 | 0.05 | 1.2 |

Based on our analysis of the size of lead battery chip fragments as well as past experience on hazardous waste sites, concentrations of soil lead across most of the Site, as determined by extensive XRF screening, consistently fell well below 25,000 mg/kg. Using 25,000 mg/kg as a breakpoint concentration level in our formula yielded a potential airborne exposure at the OSHA AL, when an ambient dust level of 1.2 $mg/m^3$ is generated from intrusive site operations. Based on historical aerosol sampling, typical background dust levels on construction sites range from 0.1 to 0.7 $mg/m^3$. Proper application of dust suppression techniques should maintain dust levels to this range. Therefore, across most of our Site, for airborne concentrations of lead to reach just the OSHA AL (not the OSHA PEL/ACGIH TLV, which is higher), total ambient dust levels (generated from site soils containing an average load of 25,000 mg/kg lead) would need to exceed 1.20 $mg/m^3$ (two times typical dust levels) for a consecutive 8-hour period. For these reasons, a full air monitoring program across most of the Site does not appear warranted, unless new information surfaces during Site operations.

Hot Area

However, Site screening coupled with confirmatory sampling has identified a relatively small on-site area (calculated volume of approximately 1,500 cubic yards) where airborne concentrations may well exceed the AL or even PEL/TLV for lead, based on our maximum dust formula used in Table 5-1 and assuming standard dust suppression efforts. Therefore, during operations where these soils are excavated/handled, daily personal air sampling following established industrial hygiene protocol summarized below shall be implemented. This daily sampling shall continue until either (1) the hot area excavation/soil transport has been completed, or (2) analysis of the samples consistently (at least 3 consecutive days) yields personal exposure concentrations well below the OSHA Action Level of .03 $mg/m^3$. If this occurs, the Site Safety and Health Officer (SSHO), may elect to petition the Safety and Health Manager (SHM), requesting to discontinue sampling, as long as the employees working in the hot area continue wearing appropriate respiratory protection, described in the HASP. This petition and decision shall be documented in writing. The Remediation Contractor shall include a specific section that addresses the remediation of this "hot area", and the specifics of the proposed air sampling program, including the evaluation/approval process to be followed for the discontinuation, if proposed, of air sampling.

[3] PEL refers to the "Permissible Exposure Limit", the airborne time-weighted average exposure concentration above which it is required by OSHA that an employee wear respiratory protection. ACGIH is an acronym for the *American Conference of Governmental Industrial Hygienists*, a voluntary body of scientists that set exposure limits similar to the OSHA PELs, but based on more recent data. The ACGIH exposure values are called Threshold Limit Values (TLV), and are generally recognized as a valid exposure limit within the remediation industry.

Air Sampling Protocol
At least two workers, representing the worst anticipated field exposure situations that day, shall be sampled daily.

A charged, battery-operated low-flow personal sampling pump shall be calibrated prior to use, and placed on the workers body in such a manner that the inlet filter media shall be worn within the wearer's breathing zone.
Sampling shall follow National Institute for Occupational Safety and Health (NIOSH) Analytical Method 7300 for lead, or equivalent.
Each pump, calibrated to generate a flowrate of from 1 - 4 liters per minute, shall be equipped with a 0.8 mu mixed cellulose ester fiber filter (MCEF) cassette.
Following completion of sampling, the cassettes shall be submitted to an appropriate AIHA-approved laboratory for analysis, following standard chain-of-custody protocols as specified by the lab.
Weather information shall be recorded for each day that sampling occurs. The parameters to be recorded shall include temperature, rain/clear, wind speed and direction.

### 5.6.6 Dust Suppression

The following techniques have been shown to be effective for the controlling of and the generation and migration of dust during construction activities:

1. Applying water.
2. Wetting equipment and excavation faces.
3. Spraying water on buckets during excavation and dumping.
4. Hauling materials in properly tarped or watertight containers.
5. Restricting vehicle speeds to 10 mph.

### 5.6.7 Equipment Cleaning and Decontamination

Prior to its departure from the site, any equipment that has contacted or potentially contacted contaminated soils will be cleaned to minimize the potential for transport of contamination by mechanical means. In addition, in the event that equipment will be used interchangeably within the site to excavate, transport, or otherwise handle the soil, the need for equipment cleaning will be assessed. Equipment cleaning procedures are anticipated to include the following:

- Each transport vehicle will be visually inspected prior to leaving the site. Accumulations of soil on the vehicle tires or other exterior surfaces will be removed manually or, if necessary, by using a high-pressure water spray in a dedicated wheel wash area.
- Material handling equipment that has been used to remove contaminated soils will be cleaned to remove accumulations of soil on exterior surfaces at the work site. Prior to being used in non-affected areas or handling "clean" materials (e.g., backfill), the equipment will be cleaned using a high-pressure water spray.

- Wastewater from wash activities will be collected in 55-gallon drums. Samples of the drummed water will be collected and analyzed for RCRA metals to determine whether it should be treated as a hazardous waste. The wastewater will then be disposed of following applicable regulations.

## 5.7 Unexpected Conditions

Note that due to the multitude of historic site uses, the potential exists for encountering significant debris (such as concrete, rubble, appliances, tanks, battery casings, asbestos-containing materials (ACM)) and unexpected contamination during excavation activities and when completing the utility corridor for the central main sanitary sewer replacement and storm sewer lines crossing the site. The Remediation Contractor shall be responsible for abandoning existing groundwater monitoring wells at the site.

As discussed in Section 5.5.7, debris and pavement cleared from at or below grade will be disposed at the City's sanitary landfill. If visually contaminated soil or soil yielding an odor are encountered, the Contractor shall remove the soils and place them in a special stockpile for undetermined waste. Utility contractors other than the Remediation Contractor may also encounter visually contaminated soil or soil yielding an odor, these contractors will transport these materials to the special stockpile. The Remediation Contractor shall be responsible for disposing of this material. While current data does not indicate that excessive or unhealthful concentrations of volatile organics are present in subsurface soils, the Contractor's HASP (see Attachment B) will include provisions for the use of a PID to scan newly uncovered subsurface soils. If the PID indicates an air concentration greater than 5 ppm, the Contractor shall place these soils in the stockpile for undetermined waste as well. Undetermined contaminated materials/wastes will be managed on a case by case or area by area basis and coordination with appropriate staff/agencies.

For all soils placed in the undetermined waste stockpile, the Contractor shall notify the City for subsequent analysis and determination.

The Contractor's HASP (see Attachment B) shall establish soil and groundwater mitigation and control specifications for grading and construction activities, including health and safety provisions for monitoring exposure to workers, procedures to be undertaken in the event that previously unreported contamination is discovered, and emergency procedures and responsible personnel.

## 5.8 Site Restoration

Once soil removal activities have been completed and documented in a given area, site restoration activities will be initiated. Such actions will involve the placement and compaction of clean backfill material, restoration of the final surface area (including

placement of sod, pavement, and/or other vegetation), and installation of above-grade facilities.

## 5.9 Project Documentation and Reporting

### 5.9.1 Daily Project Monitoring

Through a variety of mechanisms, response actions will be monitored on a continuous basis. Separate from any SD DENR oversight, the City will implement a series of activities to ensure communication between the City and its contractors. Open lines of communication are necessary to monitor and document the progress of the response actions and quickly and accurately respond to items requiring clarification. In addition to daily project meetings (both formal and informal), the City will utilize an on-site observer to gauge and document the contractor's activities and his general compliance with the ERP. Field notes, supplemented with periodic photographic documentation, will also be collected to document the project status. Other types of project monitoring will be in the form of project correspondence between the City, its contractors, SD DENR, and USEPA and the use of survey equipment to confirm that the final removal limits are consistent with the remedial design.

### 5.9.2 Record Drawings

During construction, the contractor will be required to maintain one set of Record Drawings at the site, on which the contractor will show any scope of work changes. The Contractor will be required to notify the City prior to any changes being made to the scope of work. These drawings will be kept current on a day-to-day basis in concert with the progress of the work. The following items are examples of the types of changes that could occur and must be recorded by the contractor:

- Changes in limits/extent of removal;
- Changes in materials, such as fill materials;
- Changes in topographical contours of finished grades;
- Additions to project activities;
- Elimination of a project component; and
- Unforeseen modifications made to existing underground utilities, fences, etc., made necessary by requirements of the work.

Upon completion of the project, the contractor will provide Record Drawings to the City for use in preparation of the Final Completion Report.

### 5.9.3 Project Modifications

In the event that the remedial activities cannot be implemented in accordance with the conditions identified in this Plan, or SD DENR/USEPA approval of the document, the City will prepare written documentation concerning the deviation, as well as the proposed

measures (if any), needed to maintain compliance with the targeted removal action outcome. Any proposed modification will be submitted to SD DENR/USEPA for approval prior to its implementation.

### 5.9.4 Final Completion Report

Upon completion of the remedial activities, a Final Completion Report will be prepared, providing a description of the removal activities, including the results of post-excavation confirmatory sampling, quantities of soil removed, disposition locations, and documentation of any removal action modifications, if applicable. The Final Completion Report will provide Record Drawings depicting post-removal site conditions. Record Drawings will be based on physical measurements and/or survey measurements obtained by the City and its contractor.

In addition, the Final Completion Report will include an assessment of soil data collected prior to and during the remedial activities. This data validation effort will be conducted in accordance with the current SAP/QAPP.

# 6.0 FUTURE ACTIVITIES MANAGEMENT PLAN

## 6.1 General

The purpose of the Future Activities Management Plan is to describe the institutional controls and procedures that will be established to prevent exposure to environmental concerns during future construction and subsurface activities at the Brownfield site. This work could include repairing utilities or constructing improvements with subsurface components in either the redevelopment corridor or beneath the recreational park area cover system.

The City of Sioux Falls "Phillips to the Falls Brownfield Pilot Project" is located on the river corridor at the north edge of the downtown area. The site included a number of different uses, including a former salvage operation, a brickyard, South Dakota State Rail Authority trackage and lands, and public access to the riverbank. The majority of the site was formerly owned by Pitts Inc., which used the property for scrap metal salvaging, lead-acid battery storage, and shipping. The Brownfield site, which is approximately 25 acres, is bordered on the north by Falls Park Road and the Burlington Northern Santa Fe (BNSF) railroad, on the west by commercial properties on the east side of Main Street, on the south by Sixth Street, and on the east by Sioux Steel and the Big Sioux River (see Figure 6-1).

As of December 2004,the City of Sioux Falls has completed the remediation of the site as well as other site improvements. Remediation consisted of the excavation of contaminated soils, foundations, and debris. Excavated foundations and debris and a portion of the soils were disposed of at the Sioux Falls landfill. The remaining excavated soils were placed under a soil cap consisting of a minimum of 12 inches of clean compacted clay and 18 inches of clean top soil. The cap is in place east of Phillips Avenue. Site improvements consisted of the extension of Phillips Avenue from 5$^{th}$ Street north to Falls Park Drive, removal of a main line and side tracks between 6$^{th}$ Street and just north of Falls Park Drive, enlargement of an interceptor sewer in the park area of the site, and the construction of a new storm sewer beginning at 4$^{th}$ and Main and extending to a new outfall on the Big Sioux River.

The Brownfield site is segregated into two functional areas by the construction of the Phillips Avenue extension. The area to the east of Phillips Avenue is being developed into a recreational park area that will be an extension of Falls Park. The City of Sioux Falls owns this property. The area to the west of Phillips Avenue is available for business/commercial redevelopment. The City of Sioux Falls currently owns or is purchasing much of the property that is available for redevelopment.

## 6.2 Remediation Activities

The majority of the site operations of the Pitts Inc. took place along the proposed Phillips Avenue alignment or just to the west of this alignment (See figure ????). Characterization of the Brownfield site was completed based on historical operations and in areas where contamination was likely. These areas included the recycling operations, railroad roundhouse, and rail lines. Detailed information relating to site characterization is included in the *Brownfield Site Assessment Site Characterization Report, March 2003*.

Soil screening levels were calculated for several different exposure scenarios for both the park area and the redevelopment corridor. The exposure scenarios were developed for recreational users, construction workers, occupational users, and groundwater migration.

In comparing the characterization results with the approved screening levels, the park area was lightly contaminated. Chemicals of concern were lead, arsenic, methylene chloride, and several semi-volatile organic compounds (SVOCs). Methylene chloride was detected in the method blanks and was considered as a laboratory artifact in the evaluation. Benzo(a)pyrene and arsenic slightly exceeded recreational user screening levels while lead exceeded both the recreational user and construction worker screening levels. The balance of SVOC compounds that were detected exceeded the groundwater migration pathway.

The redevelopment corridor contained higher levels of contamination than the park area because of the past operations that occurred in that location. Chemicals of concern were lead, arsenic, chromium, mercury, selenium, polychlorinated biphenyls (PCBs), several volatile organic compounds (VOCs), and several SVOCs. Methylene chloride was detected, and as stated previously was felt to be a laboratory aberration. Benzo(a)pyrene and arsenic slightly exceeded occupational user screening levels while lead exceeded both the occupational user and construction worker screening levels. PCBs, chromium, mercury, selenium, and the balance of VOCs and SVOCs that were detected exceeded the groundwater migration pathway. Remedial actions performed to remove and contain the contaminates found in the redevelopment corridor are discussed below.

The site remediation was designed to meet the substantive requirements for soil management outlined by SD DENR. Selected correspondence with Region 8 of the USEPA and SD DENR that discusses established soil action levels and management requirements is included in Attachment C. Following the evaluation of several remedial alternatives, the following recommendations were presented to Region 8 of the USEPA and SD DENR.

Recreational Park Area: An engineered cover system was placed over the park area in conjunction with the use of institutional controls (defined in subsequent sections) to mitigate the potential surface and subsurface exposures in the park area. No other remedial measures were recommended or implemented for this area. The cap serves as a physical barrier to prevent dermal contact and inhalation of dusts in addition to reducing the amount of infiltration that occurs (thus reducing the potential for leaching constituents

into groundwater). The institutional controls serve to manage the exposures to individuals that could potentially come in contact with subsurface materials.

Redevelopment Corridor: In the redevelopment area, a site-specific screening level (SSSL) for lead of 1,000 mg/kg was developed in conjunction with Region 8 of the USEPA. Because other contaminants discussed previously were observed to be co-located with lead, it was felt that removal of lead would also remove these constituents. Soils in the redevelopment area with lead concentrations greater than the SSSL were removed unless there was a minimum of 2 feet of clean soil or other material separating the lead-contaminated soil. Soils with the highest lead concentrations were placed below the cap in the park area. Remaining soils that were excavated from the redevelopment corridor were disposed of in the City's landfill. Figures 6-2 through 6-?? present known lead concentrations below ground surface in the the park area and the redevelopment corridor prior to and after the 2004 Brownfield Remediation Activities. A review of remediation activities is included in the Brownfield Site Final Completion Report, June 2006.

Construction workers may encounter chemicals of concern while performing subsurface work such as installing or repairing utilities or building foundation components. Construction workers have the potential to ingest or come into direct contact with contaminated soil. Proper planning, training, and the use of personal protective equipment (PPE) will be used to mitigate potential risks to construction workers. All subsurface activities at the site, whether in the park area or the redevelopment corridor, will be completed using a health and safety plan prepared to ensure worker safety. Workers involved in intrusive activities that will come in contact with subsurface soils must have completed OSHA training appropriate for the activity and wear appropriate PPE while performing subsurface work.

## 6.3 Institutional Controls

The remediation effort completed in the park area and the redevelopment corridor does not allow for unlimited use and unrestricted exposure at the site. Therefore, in order to reduce or eliminate the potential exposure to human health and the environment posed by chemicals of concern at the site, certain measures will be proposed for the Brownfield site. These measures, commonly referred to as institutional controls, will be combined with existing engineering controls to reduce or eliminate this potential exposure.

Institutional controls (ICs) are non-engineered, administrative and/or legal controls that minimize the potential for human exposure to environmental chemicals of concern by limiting land or groundwater use. The primary criteria for an IC are that they provide legal notice to current and potential future property owners of the nature and extent of restrictions and/or provide information that restricts human behavior at the site. Additionally, they must be permanent and legally valid. ICs to address subsurface contamination to be left in place at the site will be used to meet the following objectives:

1. To inform future owners in the redevelopment corridor that residual contamination may still exist at the site.
2. To mitigate any potential risks to future construction workers resulting from exposure to subsurface soils.
3. To ensure the future integrity of the recreational park area cap.
4. To prohibit the use of groundwater beneath the recreational park area or the redevelopment corridor.

Two general categories of ICs have been considered for use at the Brownfield site. These categories are governmental controls and proprietary controls. Governmental controls include zoning restrictions, ordinances, statutes, building permits, or other provisions that restrict land or resource use at the site. Proprietary controls involve legal instruments placed in the chain of title of the site or properties, such as easements or covenants.

These categories have been evaluated and applied to the park area and the redevelopment corridor separately. When reference is made to the redevelopment corridor, this refers to the area west of west sidewalk along Phillips Avenue. Figure 6-11 presents the areas defined as the park area and the redevelopment corridor.

### 6.3.1 Evaluation of Institutional Controls

Several different types of ICs have been considered to enhance the protectiveness of the remediation. More than one IC will be implemented in both the park area and the redevelopment corridor.

Two primary criteria were used in the evaluation of the ICs. These criteria were the long-term effectiveness or reliability and the ability to implement of the ICs. While considering both governmental and proprietary controls, a number of different factors have been considered. The park area is owned by the City and will be managed as a park in perpetuity. The redevelopment corridor, also owned by the City, is a collage of separate parcells of land and will have to be divided prior to development. Although the redevelopment corridor would likely be divided into several parcels, the properties would essentially remain contiguous. It is likely that the redevelopment corridor will be resold to private entities and potentially resold prior to redevelopment.

Unlike the park area, the property in the redevelopment corridor could change ownership several times in the future. Additionally, the primary contaminant of concern in the redevelopment corridor is lead. Because lead is persistent, if it is present in the subsurface, it will likely remain there unless additional remediation is performed. The ICs for the redevelopment corridor need to consider these factors. The State and the City have cooperated on the remediation project and will be reviewing and commenting on the proposed ICs. Based on this cooperative effort, there are no anticipated difficulties in implementing the ICs on the Brownfield site.

The following governmental and proprietary controls were evaluated for both the park area and redevelopment corridor.

- Governmental controls – zoning, permits, ordinances and groundwater restrictions
- Proprietary controls – Covenants

Attachment D presents examples of what these two types of ICs may look like.

### 6.3.2 Proposed Institutional Controls for the Park Area

ICs serve as a formal mechanism to inform future owners and others that contamination may still exist at a site or that certain actions are prohibited. Within the park area, excavated soils containing elevated levels of lead from the construction of Phillips Avenue and the redevelopment corridor have been placed underneath the cap. These soils will be left in place beneath the cap, thus providing a physical separation between park users and soils containing chemicals of concern. ICs will be implemented to ensure that any future workers are adequately informed of site risks if subsurface work is ever necessary.

The City will be responsible for the implementation, monitoring, and enforcement of the following ICs for any potential subsurface contamination left in place at the site.

1. The City will rezone the area bounded on the east by the Big Sioux River and Sioux Steel, on the south by 6$^{th}$ Street, on the west by Phillips Avenue (see Figure 6-11), and on the north by the BNSF railroad for park use only. No other uses of this site will be allowed.

2. The City will develop an ordinance requiring notification to and approval from the City of Sioux Falls Planning and Building Services Department for any future excavation or subsurface construction activity or any other activity that would penetrate the cap. For all approved subsurface activities, the following Construction Management Procedures will be implemented:

    a. The City will require all private development Contractors to prepare and implement a written Health and Safety Plan (HASP) covering subsurface work activities. The HASP will require that all potentially exposed workers wear personal protective equipment such as respirators, chemical-resistant clothing, gloves, and boots in all operations as deemed necessary. Development of the HASP will be governed by Subpart E of the Occupational Safety and Health Administration (OSHA) regulations contained in Title 29 Code of Federal Regulations (CFR) Part 1926, which specifies the use, selection, and maintenance of personal protective equipment. The City will make available to Contractors the Final Completion Report and the *Brownfields Site Assessment Site Characterization Report* (March 2003), which document the Brownfield site remediation efforts and initial site characterization. The City will also

develop its own HASP for protection of City staff and Contractors working under City contracts.

b. If contaminated soil or water is encountered that requires corrective action, the Contractor shall adequately contain, characterize, and properly manage waste as soon as possible under applicable regulations. The Contractor's HASP shall establish soil and groundwater mitigation and control specifications for grading and construction activities. This shall include health and safety provisions for monitoring exposure to construction workers, procedures to be undertaken in the event that previously unreported contamination is discovered, a contaminated material handling plan to prevent adjacent park land from becoming contaminated, and emergency procedures and responsible personnel.

c. Any contaminated construction materials will be properly cleaned or disposed.

A restriction will be developed by the City to prohibit the installation of water wells anywhere within the park area.

### 6.3.3 Proposed Institutional Controls for the Redevelopment Corridor

Within the redevelopment corridor, no contaminants other than lead were detected above construction worker SSSL (site specific screening level) in subsurface soils. However, because the potential remains for contamination to be present within the redevelopment corridor at locations not sampled, institutional controls will be used to address potential contamination discovered by a party completing future work at the site or by a future property owner. Other than IC 1 below, the other ICs will not be completed until an agreement transferring the redevelopment corridor properties has been executed.

1. A restriction will be developed by the City to prohibit the installation of irrigation or drinking water wells anywhere within the redevelopment corridor.

2. A notice will be placed on each property deed as they are platted for any property that it was formerly a Brownfield site and that elevated concentrations of lead or other contaminates may remain at depths greater than two feet below grade.

3. The City will develop a restrictive covenant requiring the potential property owner or developer to determine whether an investigation for the parcel being purchased is required. The City must be notified in writing of the decision. If an investigation is required and contamination is identified and remediation is required, the property owner will be required to coordinate with the South Dakota Department of Environment and Natural Resources and the City for removal or remediation prior to construction. The following Construction Management Procedures will be implemented for investigation and remediation activities:

a. The City will require all Contractors to prepare and implement a written Health and Safety Plan (HASP) covering investigation and, if necessary, subsurface work activities. The HASP will require that all potentially exposed workers wear personal protective equipment such as respirators, chemical-resistant clothing, gloves, and boots in all operations as deemed necessary. Development of the HASP will be governed by Subpart E of the Occupational Safety and Health Administration (OSHA) regulations contained in Title 29 Code of Federal Regulations (CFR) Part 1926, which specifies the use, selection, and maintenance of personal protective equipment. The City will make available to Contractors the Final Completion Report and the *Brownfields Site Assessment Site Characterization Report* (March 2003), which document the Brownfield site remediation efforts and initial site characterization.

b. If contaminated soil or water is encountered that requires corrective action, the Contractor shall adequately contain, characterize, manage, and dispose of the material in accordance with applicable regulations as soon as possible. The Contractor's HASP shall establish soil and groundwater mitigation and control specifications for grading and construction activities. This shall include health and safety provisions for monitoring exposure to construction workers, procedures to be undertaken in the event that previously unreported contamination is discovered, and emergency procedures and responsible personnel.

## 6.4 Post-Remediation Monitoring/Observations

The following subsections describe the monitoring and observation activities that will be conducted following completion of the soil removal and restoration activities in the redevelopment corridor and placement of the cap in the recreational park area.

### 6.4.1 Redevelopment Corridor

#### 6.4.1.1 Restoration Adequacy

In the spring of 2005, the City will inspect the restored surface on a monthly basis to identify potential problems associated with the restoration activities, such as settlement, stressed vegetation, or drainage issues, and will correct any deficiencies. This will continue until the property is transferred to another owner.

#### 6.4.1.2 Intrusive Activities

Except for the locations noted in the following paragraph, all known soils containing concentrations of lead above the calculated risk-based concentration of 1,000 mg/kg have

been removed from the redevelopment corridor (see the Brownfield Site Final Completion Report for details of the remediation).

In the areas known to contain soils above 1,000 mg/kg, a minimum of 2 feet of material is in place on top of these soils. This cover provides an adequate buffer to prevent exposure to these soils. These soils are located at the following grid points 12DD, 13M, 13Q, 13U, 13V, 13W, 13X, 13Z, 13AA, 14U, 14W, and 14X (see Figures 6-2 through 6-10 for grid locations and Figures B-1b through B-9b of the Final Completion Report for soils remaining following remediation). Subsurface construction greater than 2 feet within these areas should be preceded by some characterization to confirm concentrations of soils left in place and the appropriate course of action. All intrusive construction activities that would be deeper than 2 feet should be conducted within the framework of the ICs described in Section 6.3.

Construction in areas outside of the grid area identified in the previous paragraph are located in areas where all known Type III (lead concentrations greater than 1000 mg/kg) soils have been removed. Construction of residential and non-residential buildings with above-ground occupancy is allowed in this area. Buildings with below-ground occupancy may be allowed in these areas of the redevelopment corridor if the owner/developer can demonstrate that occupants would not be exposed to potential contaminants at the site. Risk-based modeling may be used to demonstrate that occupants would not be subject to above-normal risks. The results of any characterization, remediation, and/or modeling must be accepted by SD DENR. Any contamination or suspect conditions encountered during construction shall be reported to the City's Environmental Division and the DENR, and the remaining work conducted within the framework of the ICs described in Section 6.3.

### 6.4.2 Recreational Park Area

#### 6.4.2.1 Cap Integrity

Contaminants to be left in place that exceeded groundwater migration SSSLs in the recreational park area are various PAHs. Installation of the low permeability cap with placement of additional fill and vegetation will reduce the amount of surface water that will infiltrate into the subsurface soils and will thereby reduce the driving force for the migration of contaminants downward to the groundwater in the park area.

The City's Parks and Recreation Department will be responsible for performing inspections every spring and fall for the cap placed over the park area. The property will be inspected by the Parks and Recreation Department during April and October to ensure that the vegetation is growing as anticipated and is providing the necessary erosion control and that the restored/enhanced drainage system(s) are functioning properly.

Additional planting will be undertaken as needed to replace dead or dying vegetation or to fill in any gaps resulting from less than adequate growth, and drainage modifications will be performed as necessary to correct any issues resulting from work performed at the

property. The City will make available reports of such inspection and maintenance activities to SD DENR/USEPA.

#### 6.4.2.2 Intrusive Activities

The cover system in the park area consists of a nominal 12 inches of compacted clay and 18 inches of topsoil in all areas east of Phillips Avenue, except for the area designed to carry surface runoff from storm water from certain downtown areas. The area designed to carry surface runoff is underlain by a geosynthetic membrane and 18 inches of topsoil.

The City intends to provide improvements to the park area. These improvements include walking trails, irrigation system, interpretive displays, scenic overlooks for the Falls, and nominal vegetative plantings.

The cover system has been designed to serve as a barrier for materials either left in place or placed below the cover system. In order to maintain the effectiveness of this barrier, no intrusive activities that would penetrate the compacted clay layer or the geosynthetic membrane will be allowed on the cover system without the knowledge and authorization of the City's Environmental Division.

Intrusive activities should be limited to the top 18 inches of the cover system. A detailed plan must be submitted to the Environmental Division for review and approval. At a minimum, the plan must identify the activities that will be performed, the schedule for the activities, the procedures that will be implemented to prevent penetration of the compacted clay layer or the geosynthetic membrane, and the procedures that will be implemented to repair any breach of the clay layer or the geosynthetic membrane. Figure 6-12 provides an example of repairs that could be implemented for repair of the compacted clay layer. The Environmental Division will provide oversight of any improvements to the park area.

#### 6.4.2.3 Trees and Shrubs

The City intends to develop park features that will incorporate a limited number of trees and shrubs. The issue of planting trees and shrubs in conjunction with the cover system was discussed in correspondence to SD DENR dated February 11, 2004 (see Attachment C). The following recommendations are intended to support the installation of trees and shrubs in the park so that the purpose and integrity of the capping system are not affected.

In areas where trees and shrubs are to be planted, a minimum of an additional 3 feet of nutrient-rich topsoil shall be placed upon the existing grade. This will require a minimum of 4 feet 6 inches above the top of the compacted clay layer. The City's Environmental Division will review the location of plantings on the cover system. The additional soil depth shall extend the width of one-half the diameter of a fully mature tree or shrub beyond the radius of the mature tree or shrub. For example, if a tree is estimated

to be 20 feet in diameter when fully mature, the depth of additional soil should extend 30 feet beyond the center of the tree in all directions.

The species of tree or shrub selected must be shallow rooted (14 to 24 inches, see attachment C for acceptable species). The county extension and state universities should be consulted to confirm the appropriateness of the selected species. Consideration may also be given to planting trees and shrubs in confined pottings or the use of biological barriers to control root penetration.

# 7.0 PROJECT SCHEDULE

A master schedule for the remediation and development of the site is shown in Figure 7-1.

# Attachment A
## Construction Contractor Requirements

# Attachment A
## Construction Contractor Requirements Used For The Sioux Falls Brownfield Pilot Project Sioux Falls, South Dakota

The following is a list of responsibilities that contractors of the Sioux Falls Brownfield Pilot Project are expected to fulfill. The Contractor shall take all reasonable safety and occupational health measures in performing this contract. The Contractor shall comply with all Federal, State, and local laws applicable to safety and occupational health and with the safety and occupational health standards, specifications, reporting requirements, and any other relevant requirements of this contract.

Should any unforeseen hazard become evident during the performance of work, the Contractor's Site Safety and Health Officer shall bring such hazard information to the attention of the City (both verbally and in writing) for resolution as soon as possible. In the interim, necessary action shall be taken to reestablish and maintain safe working conditions.

In general, contractors must:

a. Provide for the safety and health of their employees and subcontractors

b. Maintain an effective safety and health program and follow all safety and health requirements that apply to the contract.

c. Protect team members and members of the public that may visit or work in areas where their employees or subcontractors work.

d. Provide products, equipment, and services that meet OSHA safety and health requirements in design and operation without modifications or restrictive procedures.

e. Make sure their subcontractors (if any) follow OSHA safety and health requirements. Document this "flow down" of safety and health responsibility.

f. Allow their contracting officer, City safety or health personnel, and State or federal OSHA personnel access to their operations for safety or health inspections or investigations.

g. Prepare a health and safety plan (HASP) that covers the following elements in project-specific detail (see Attachment C):

**1. Site description and contamination characterization**

The HASP shall provide a description of the contamination with the exposure potential to adversely affect safety and occupational health and likely to be encountered by the on-site work activities.

**2. Hazard/Risk analysis**

An Activity Hazard Analysis (AHA) shall be developed for each task/operation to be performed and shall account for all hazards (classic safety, chemical, physical, biological) likely to be encountered while performing the work.

**3. Staff organization, qualifications, and responsibilities**

The following personnel are required for implementation of safety and occupational health requirements at cleanup operations:

(a) **Safety and Health Manager (SHM)**

The SHM shall have a minimum of 3 years of experience managing safety and occupational health at hazardous waste site cleanup operations, and shall be certified by the American Board of Industrial Hygiene (ABIH) in the comprehensive practice of industrial hygiene (CIH). The SHM may enlist the support of safety and occupational health professionals with appropriate education and experience when working on sites with multiple (chemical, biological, physical/safety) hazards. The SHM is responsible for the following actions:

(i) Develop, maintain, and oversee implementation of the HASP.

(ii) Visit the project as needed to audit the effectiveness of the HASP.

(iii) Remain available for project emergencies.

(iv) Develop modifications to the HASP as needed.

(v) Evaluate occupational exposure monitoring/air sampling data and adjust HASP requirements as necessary.

(vi) Serve as a QC staff member.

(vii) Approve the HASP by signature.

(b) **Site safety and health officer (SSHO)**

The SSHO shall have 2 years of experience implementing safety and occupational health procedures at cleanup operations, and have the training and experience to conduct exposure monitoring/air sampling and select/adjust protective equipment use. The SSHO shall have the authority and is responsible for the following actions:

(i) Be present during cleanup operations to implement the HASP.

(ii) Inspect site activities to identify safety and occupational health deficiencies and correct them.

(iii) Coordinate changes/modifications to the HASP with the SHM and contracting officer.

(iv) Conduct project specific training.

(v) Be trained to recognize potentially dangerous conditions and materials, including asbestos-containing materials and hazardous materials mixed in debris.

**4. Training**

Personnel shall comply with the following general and project specific training requirements:

(a) **General training**. General training requirements apply to project personnel exposed to contaminant-related health and safety hazards. General training must comply with the following requirements:

(i) 40-hour off-site hazardous waste site instruction. Off-site instruction must comply with the 40-hour training requirements in OSHA standards 29 CFR 1910.120 and 29 CFR 1926.65.

(ii) 8-hour annual refresher training. Refresher training must comply with the requirements in OSHA standards 29 CFR 1910.120 and 29 CFR 1926.65.

(iii) 3 days of field experience under the direct supervision of a trained, experienced supervisor.

(b) **Supervisory training**. On-site supervisors must comply with the 8-hour supervisory training requirements in OSHA standards 29 CFR 1910.120 and 29 CFR 1926.65.

(c) **Project-specific training**. The following project-specific training shall be provided to workers before onsite work begins:

(i) Training specific to OSHA standards in 29 CFR 1910 and 29 CFR 1926 that are applicable to site work and operations.

(ii) Training covering each element in the HASP.

**5. Personal protective equipment (PPE)**

Describe the PPE and emergency equipment to be made available to protect

workers from site-related hazards (construction safety and health and contaminant-related) and how it is to be used by employees.

**6. Medical surveillance**

All personnel performing on-site work that will result in exposure to contaminant-related health and safety hazards shall be enrolled in a medical surveillance program that complies with OSHA standards 29 CFR 1910.120 (f) and 29 CFR 1926.65 (f).

**7. Exposure monitoring/Air sampling program**

Exposure monitoring and air sampling shall be performed to evaluate effectiveness of prescribed PPE and to evaluate worker exposure to site-related contaminants.

**8. Heat and cold stress**

Standard procedures and practices for protecting workers from heat and cold stress shall be specified.

**9. Standard operating safety procedures, engineering controls, and work practices**

Safety and occupational health procedures, engineering controls and work practices shall be addressed for the following as appropriate:

(a) Site rules/prohibitions (buddy system, eating/drinking/smoking restrictions, etc.).
(b) Work permit requirements (excavation, hot work, etc.).
(c) Material handling procedures (soil, liquid, spill contingency).
(d) Drum/container/tank handling (opening, sampling, overpacking, draining, pumping, purging, cleaning, excavation and removal, disassembly and disposal, spill contingency).

**10. Site control measures**

Work zones shall be established so that on-site activities do not spread contamination. The site shall be set up so that there is a clearly defined exclusion zone (EZ) and a clearly defined support zone (SZ) with a contamination reduction zone (CRZ) as a transition between the EZ and SZ.

**11. Personal hygiene and decontamination**

A personal hygiene and decontamination station shall be set up in the CRZ for personnel to remove contaminated PPE and to wash when exiting the EZ.

**12. Equipment decontamination**

An equipment decontamination station shall be set up in the CRZ for equipment to be decontaminated when exiting the EZ.

**13. Emergency equipment and first aid**

Emergency equipment required to be on-site shall have the capacity to respond to project-specific emergencies.

**14. Emergency response and contingency procedures**

An Emergency Response Plan (ERP) shall be developed that addresses the following emergency response and contingency procedures:

(a) Pre-emergency planning. An agreement shall be established between the Contractor local emergency responders, and the servicing emergency medical facility that specifies the responsibilities of on-site personnel, emergency response personnel, and the emergency medical facility in the event of an on-site emergency.

(b) Personnel and lines of authority for emergency situations.

(c) Criteria and procedures for emergency recognition and site evacuation (e.g., emergency alarm systems, evacuation routes and reporting locations, site security).

(d) Decontamination and medical treatment of injured personnel.

(e) A route map to emergency medical facilities and phone numbers for emergency responders.

(f) Criteria for alerting the local community responders.

# Attachment B
## Construction Contractor Requirements Used For The Sioux Falls Brownfield Pilot Project
### Sioux Falls, South Dakota

# Attachment B
# Construction Contractor Requirements Used For The Sioux Falls Brownfield Pilot Project
**Sioux Falls, South Dakota**

## B.1 Applicability

This Scope applies to all future intrusive activities conducted on the Sioux Falls Brownfield Site, defined herein as the disturbance or removal of subsurface soils 24" or deeper below ground surface (bgs). These subsurface site soils potentially contain low levels of contaminants, and future work that involves exposure shall be conducted in accordance with the safety requirements contained in 29 CFR 1926.65 – *Hazardous Waste Operations*.

Examples of potential future activities might include the placement/removal or repair of subsurface utilities, or the installation of surface encumbrances such as telephone/power poles. These activities will disturb potentially contaminated soils, and could expose the Site workers to airborne and contact particulate and vapor contaminant hazards, and if allowed to disperse by poor handling practices, contaminate off-site areas and present a hazard to area users. The requirements contained in this Scope do not apply to surficial activities such as paving maintenance/repair, vegetation planting/seeding/mowing and associated maintenance operations, or the installation of guardrails, surface signs, plaques, monuments, etc.

## B.2 Site-Specific Health and Safety Plan (HASP)

### B.2.1 General

The Contractor responsible for the tasks defined in this Scope shall review all information provided and develop the necessary Health and Safety Plan (HASP) which contains the health and safety criteria, procedures, and practices sufficient to protect on site personnel, the environment, and potential offsite receptors from the chemical and physical hazards particular to this Site. The Contractor shall utilize the services of a professional experienced in hazardous waste site operations to oversee the development and implementation of the HASP required by this Scope.

The HASP shall be prepared by the Contractor and submitted to the Client for review prior to the commencement of any on site intrusive work activity to be performed by the Contractor and/or his subcontractors. The level of detail provided in the HASP shall be tailored to the type of work, complexity of operations to be accomplished, and hazards anticipated.

It is anticipated that any Site project will involve the excavation of Site soils, the installation/replacement/alteration or modification of a subsurface utility, and the backfilling of removed soils, but other reasons may develop for the future intrusion into Site soils. All topics required by OSHA standard 1926.65(b)(4), and those described

below, shall be addressed in the HASP. Where the use of a specific scope element is not applicable to the project, the Contractor shall provide a negative declaration and a brief justification for its omission, to establish that adequate consideration was given the topic.

### B.2.2 Regulatory Requirements

The HASP required by this scope of work shall comply with and reflect the following regulations and appropriate guidance publications, as a minimum:

- Occupational Safety and Health Administration (OSHA) Construction Industry Standards, 29 CFR 1926, and General Industry Standards, 29 CFR 1910; especially 29 CFR 1926.65 - "Hazardous Waste Operations and Emergency Response", 29 CFR 1910.1000 – "Air Contaminants", 29 CFR 1926.62 - "Lead", 29 CFR 1926.1118 – "Arsenic" and 29 CFR 1926.650-.652 - "Excavations".

- NIOSH/OSHA/USCG/EPA, "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities", October 1985.

- American Conference of Governmental Industrial Hygienists (ACGIH) "Threshold Limit Values", latest edition.

- Any other applicable Federal, State, and local safety and health requirements.

## B.3 Staff Organization, Qualifications, and Responsibilities

The HASP shall present the organizational structure, including lines of authority (chain of command), and overall responsibilities of the contractor and all subcontractors for site activities, including supervisor/employee relationships. Summarize the operational and health and safety responsibilities and qualifications of each key person identified.

Specifically: (1) A professional with experience in hazardous waste site operations shall be responsible for the development, implementation, and oversight of the Health and Safety Program and HASP. The HASP shall be signed and dated by the preparer prior to client submittal; (2) A fully trained and experienced Site Safety and Health Officer (SSHO) may be delegated to implement and continually enforce the safety and health program and site-specific plan elements on-site; and (3) At least one prime contractor worker certified in first aid/CPR by the Red Cross, or equivalent agency, shall be continuously present on-site during site operations.

# Attachment B
## Construction Contractor Requirements Used For The Sioux Falls Brownfield Pilot Project
**Sioux Falls, South Dakota**

### B.4 Site and Project Description

The contractor shall describe the location and approximate area of the Site to be impacted, the purpose for being there, the on-site jobs/tasks to be performed, and the duration of planned site activities.

### B.5 Hazard/Risk Analysis

The HASP shall include a hazard analysis section, presenting the chemical, physical, biological, and safety hazards of concern for each site task and/or operation to be performed. Describe chemical and physical properties of selected contaminants, sources and pathways of employee exposures, anticipated on and off-site exposure level potentials, and current regulatory (including Federal, State, and local) or recommended protective exposure standards. Specify and justify "action levels" based upon airborne exposure hazards and direct skin contact potentials for upgrades/downgrades in levels of personnel protection; for implementation of engineering and/or work practice controls; for emergency evacuation of on-site personnel; and for the prevention and/or minimization of public exposures to hazards created by site activities.

### B.5.1 Chemical Hazards

The HASP shall contain a complete list of the soil contaminants known to be present in site areas to be impacted by the work to be performed. Compilation of this listing shall be based on results of previous studies and current knowledge. Include chemical names, concentration ranges, depth where present, and estimated quantities/volumes to be impacted by site work.

Based on site sampling conducted in 2002, the following contaminants of concern were identified at the site at concentrations exceeding established screening levels: arsenic, chromium, lead, mercury, and polyaromatic hydrocarbons.

It should be stated that since these results were obtained from discrete sampling locations rather widely dispersed, there is the possibility that (a) the highest concentrations of these or other identified contaminants were not sampled, or (b) other as yet unidentified site contaminants are present in the subsurface soils. Therefore, the Contractor should exercise caution when developing any HASP for future Site intrusive work, especially regarding levels of PPE to be worn and contaminant monitoring methodology to be employed.

Established exposure guidelines for the various contaminants likely to be encountered during excavation activities can be found in Table 1. Although all routes of exposure may present potential risk to field personnel to these contaminants, it is anticipated that

incidental ingestion of hazardous contaminant particulates and inhalation of contaminated particulates pose the greatest hazard, with the possibility of skin irritation from dermal exposure being possible, but unlikely.

Additional specific health, toxicity and target system information may be found in the specific chemical contaminant's material safety data sheet (MSDS).

**Table 1 - Potential Site Contaminants[a]**

| Contaminant | OSHA Action Level ($mg/m^3$) | OSHA PEL ($mg/m^3$) | ACGIH TLV ($mg/m^3$) | IDLH (NIOSH) ($mg/m^3$) | Route[b] | IP[c] (eV) |
|---|---|---|---|---|---|---|
| Arsenic | 0.005 | 0.01 | 0.01 | 5 | Inh Ing Con | N/A |
| Chromium | N/A | 0.5 | 0.5 | 250 | Inh Ing Con | NA |
| Lead | 0.03 | 0.05 | 0.05 | 100 | Inh Ing Con | N/A |
| Mercury | N/A | 0.05 | 0.025 | 10 | Inh Ing Con | Unknown |
| Polyaromatic Hydrocarbons (coal tar pitch volatiles) | N/A | 0.2 | 0.2 | 80 | Inh Ing Con | N/A |

**Notes:**
(a) Based on data collected and presented in the *Brownfield Site Assessment Site Characterization Report*, March 2003.
(b) Inh = inhalation; Ing = ingestion; Con = skin contact.
(c) IP = ionization potential.

### B.5.2 Physical Hazards

Physical hazards anticipated to be present during any intrusive Site operations include slips, trips, and falls; heavy moving construction equipment; and other equipment associated with construction and excavation activities. To prevent slips/trips, the HASP should present preventative measures that will be employed, including housekeeping. A Table, similar to Table 2 shown below, should be included in the HASP, which summarizes the heavy/mobile equipment that will be present on-site, the types of hazards

associated with working around each, and any special safety precautions, which will be required.

**Table 2 - Auxiliary Equipment**

| Auxiliary Equipment | Hazard(s) | Special Safety Precautions |
|---|---|---|
| Mobile equipment; front-end loaders; fork lifts; skid loaders, sweepers | Collisions with other equipment or personnel, major utility disruptions | Safety briefings; barrier tape; controlled access to areas, backup alarms or spotters if necessary; high visibility PPE |
| Backhoes; trenchers and excavators | Falls; trips; cave-ins; confined spaces; collisions with other equipment or personnel; major utility disruptions | Safety briefings; controlled access to areas; barrier tape; backup alarms, increased site lighting; high visibility PPE |
| Power tools, generators and other gas or electrical powered equipment or tools | Electric shock; external injuries from moving parts; flying foreign objects, eye and hearing hazards | Safety briefings on operation of equipment, personal safety equipment, use of GFCIs, inspect power cords |

### B.5.3 Environmental Hazards

Heat and/or cold stress monitoring protocols shall be implemented, as appropriate, to prevent workers from incurring related illnesses/injuries. Work/rest schedules shall be determined based upon ambient temperature, humidity, wind speed (wind chill), solar radiation intensity, duration and intensity of work, and protective equipment ensembles. If sustained high temperature work is planned, and impervious PPE is worn, a physiological heat strain monitoring protocol shall be developed, using heart rate and body temperature, following the NIOSH/OSHA/USCG/EPA "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities" protocol (or equivalent) for prevention of heat strain. Where impervious clothing is not worn, either the above physiological monitoring method may be employed, or environmental sampling, employing an integrated wet bulb/dry bulb monitor, and comparing the results against the most current published ACGIH heat stress standard (TLV) shall be used. For cold stress monitoring to help prevent frostbite and hypothermia, the most current published ACGIH cold stress standard shall be referenced and followed, as a minimum.

## B.6 Training

The Contractor shall ensure that all Contractor and subcontractor personnel receive the training specified in this Section, at a minimum. This does not in any way constitute the

whole breadth of training that may be necessary, as project site conditions and hazards vary, and additional hazard or task-specific training may be necessary.

Hazardous Waste Site Operations Training. All personnel performing on-site activities shall have completed applicable training in accordance and compliance with 29 CFR 1926.65(e). Following the requirements of this standard, all Contractor and subcontractor personnel who must enter the exclusion or contamination reduction zone must be trained to the following levels:

- Personnel engaged in hazardous substance removal or other activities, which expose or potentially expose them to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off-site, and 3 days of supervised field experience.

OR

- Personnel who perform limited activities at the Site (defined in 29 CFR 1926.65(e)(3)(ii)) and are not potentially exposed to contaminant levels above the PEL shall receive a minimum of 24 hours of instruction off-site, and 1 day of supervised field experience.

- Each employee receiving initial training, whether 40 hr or 24 hr, must successfully complete 8 hours of refresher training on an annual basis.

In addition, at least one individual designated as the Site Supervisor shall have completed an additional 8 hours of training, in accordance with the requirements of 29 CFR 1926.65(e)(4) covering the administration of a hazardous waste program.

Project personnel must have received their last training, either initial or refresher, within one year from the date of their onsite activities. The Contractor shall maintain these training records at the project site, for review by the client and/or OSHA representatives.

In addition to hazardous waste operations training, site-specific training covering site hazards (e.g., excavation safety), contaminant hazards (lead), procedures, and all contents of the HASP shall be conducted by the SSHO for on-site employees and visitors prior to commencement of work or entering the site. The type, duration, and dates of all employee training performed shall be maintained onsite fro review by the client and/or OSHA representatives.

Lead Exposure Training. The Contractor will provide Site-specific lead training for all field personnel in accordance with 29 CFR 1926.62. The content of the training will include:

- The content of the lead standard and appendices.
- The health hazards associated with exposure to lead.
- The specific nature of any operations which could result in exposure to lead above the current action level(s).
- The purpose, proper use, and limitations of respiratory PPE.
- Proper engineering controls and work practices associated with the employee's job assignment.
- The purpose and description of the Contractors medical surveillance program.

### B.6.1 Hazard Communication

All personnel performing field activities shall receive hazard communication training, in accordance with 29 CFR 1910.1200/29 CFR 1926.59. Site personnel shall be trained on the hazards of chemicals both present (Site contaminants) and brought on-Site, during an initial tailgate and/or Site-specific training session, and by reviewing the information in Section 5 and the MSDS. A site-specific list of chemicals brought on-site shall be developed and maintained by the Contractor , and maintained at the Site with the Site MSDS.

### B.6.2 Exempt Personnel

Site access by personnel making deliveries, visitors, or local residents will be limited to support areas (SZ) only. These persons will not be required to comply with the medical and training requirements as previously defined. Access will be limited to designated work, delivery, or observation areas within the SZ to minimize any potential exposure to Site contaminants. Site observation areas will be located upwind from predominant wind directions, and access to observation areas may be restricted by weather conditions or Site activities. Authorization for limited Site access will be determined on a case-by-case basis by the HSO in consultation with the Contractor and/or client.

## B.7 Tailgate Safety Meetings

It is anticipated that the Contractor will conduct regularly scheduled tailgate safety meetings. The topics to be discussed at the tailgate safety meeting include safety and health considerations for the day's activities, necessary protective equipment, air monitoring results, problems encountered and new operations. Attendance/Meeting notes will be maintained by the HSO, and placed in the project file.

### B.8 Personal Protective Equipment (PPE)

In accordance with 29 CFR 1926.65(g)(5), a written section addressing the required personal protective equipment (PPE) to be worn during each definable Site activity, and which also complies with respiratory protection program requirements of 29 CFR 1910.134 is to be included in the HASP. The HASP shall detail the minimum PPE ensembles (including respirators) and specific materials from which the PPE components are constructed for each site-specific task/operation to be performed, based upon the hazard/risk analysis performed above.

Components of levels of protection (A,B,C,D and modifications) must be relevant to site-specific conditions, including heat stress potential and safety hazards. Include site-specific procedures for donning and doffing protective clothing, including respirators, if utilized; respiratory fit-testing, cleaning, maintenance, inspection, and storage. Given the Site characteristics and known residual surficial contamination concentrations, it is not anticipated that Level(s) A or B PPE shall be necessary during any future Site activities.

### B.9 Medical Surveillance

All personnel performing on-site activities shall be participants in an ongoing medical surveillance program, meeting the requirements of 29 CFR 1926.65(f). A short description of the general medical surveillance program is to be included in the HASP. All medical surveillance protocols and examination results shall be reviewed by a licensed physician who is certified in Occupational Medicine by the American Board of Preventative Medicine, or who, by necessary training and experience, is Board-eligible. The HASP shall only describe the content and frequencies of any additional medical tests, examinations, and/or consultations determined necessary by the physician due to probable site-specific conditions, potential occupational exposures, and required protective equipment. Certification of participation in the medical surveillance program, the date of last examination, and name of reviewing occupational physician shall also be included for each affected employee.

# Attachment B
## Construction Contractor Requirements Used For The Sioux Falls Brownfield Pilot Project
**Sioux Falls, South Dakota**

### B.10 Exposure Monitoring/Air Sampling Program

It is extremely important that contact with Site contaminants be minimized and subsurface soil contamination be prevented from migrating off-site, during any future intrusive operation. This will occur if proper work and engineering controls are implemented during subsurface operations. In order to document and verify the adequacy of these controls, the Contractor shall institute both direct-reading (real-time) particulate and organic vapor monitoring and integrated (time-weighted average (TWA)) perimeter air sampling during intrusive operations. These distinct sampling/monitoring activities are discussed below.

### B.10.1 Direct Reading Air Monitoring

Direct reading monitoring shall be conducted every day that intrusive operations are ongoing, and subsurface soils are being removed, moved or transported. Monitoring shall address both potential Site organic vapors evolving from the uncovered soils, and, as needed, the collection of airborne particulates, as an indicator of the potential release of metals, particularly lead.

| Contaminant Form | Instrument | Location | Monitoring Information |
|---|---|---|---|
| Organic Vapors | Photoionization Detector (e.g., Hnu PI-101 or equivalent) | Carried about Site – used especially if stained soil is uncovered – use to verify adequacy of PPE, upgrade if necessary based on readings. | If readings in breathing zone exceed 5 ppm for a sustained period of > 5minutes, wear organic vapor filter cartridge respirator or evacuate area. |
| Airborne particulates | Mini-Ram Particulate Aerosol Monitor<br><br>A minimum of two instruments needed, more if are under intrusion is wide. | At perimeter of exclusion Zone, at both upwind and downwind directions – if site is wide add additional miniram to downward side. | Place miniram at fixed location daily at least 4 feet off ground, to prevent entry of foot traffic generated dust. Daily average upwind particulate values should be subtracted from the downwind values, with the difference being the generated Site airborne particulate load<br>Set alarm at 1.4 mg/m3 (see formula below) |

# Attachment B
## Construction Contractor Requirements Used For The Sioux Falls Brownfield Pilot Project
### Sioux Falls, South Dakota

Organic Vapor Monitoring – While current data does not indicate that excessive or unhealthful concentrations of volatile organics are present in subsurface soils, the Contractor will provide a PID onsite, that will be used daily to scan newly uncovered subsurface soils, especially those that present a stained appearance or yield an odor. The PID will read off in units roughly equivalent to parts per million, but will not positively identify the specific organic vapor "species" of chemical present. Assuming the chemical to be benzene, a prudent rule of thumb is to prevent employee inhalation exposure to any unknown organic vapor, if the air concentration remains greater than 5 ppm for greater than 5 minutes. The HASP shall make provisions for organic vapor monitoring, and present rationale similar to that presented here for PPE upgrade assuming the chemical to be benzene, or for the positive chemical identification of the organic vapor.

Miniram Rationale - Using the following formula, the maximum lead soil concentration from the BSA report sampling was utilized to generate a dust concentration, in mg per cubic meter of air ($mg/m^3$), that would result in a contaminant concentration exceeding both the current lead regulatory limit (OSHA permissible exposure level (PEL)) and the American Conference of Governmental Industrial Hygienists threshold limit value (TLV) of 0.005 mg/m3. The resultant value is presented in Table 3 in the column, *"Dust Levels w/Potential for Over Exposure"*.

**Formula Used in Table 3**

| | | | | |
|---|---|---|---|---|
| PEL/TLV (mg chemical/$m^3$ air) | | Conversion | | Dust Level That |
| Max Detected Soil Conc. | x | Factor | = | Will Result In |
| (mg chemical/kg soil (ppm)) | | (1,000,000 mg soil / 1 kg soil) | | Exposure at PEL/TLV (mg soil/$m^3$ air) |

**Table 3**

**(Soil) Dust Level Needed for an Overexposure to Lead**

| Contaminant | Maximum Soil Concentration (mg/kg) | OSHA PEL ($mg/m^3$) | ACGIH TLV ($mg/m^3$) | Dust Level w/ Potential for Over Exposure (mg soil/$m^3$ air) |
|---|---|---|---|---|
| Lead | 25,000* | 0.03 | 0.05 | **1.20** |

* The Site soil area that was found to contain this high concentration is to be excavated from the Site in 2003. Values this high have not been found in remaining subsurface soils to date.

Past experience on hazardous waste sites has shown that typical ambient dust levels on Midwestern construction sites range from 0.1 to 0.7 mg/$m^3$. As calculated based on the highest lead concentration yet found on the Site, for airborne concentrations of lead to reach the PEL/TLV, total dust levels generated from the site soil containing the maximum concentration of lead would need to exceed 1.47 mg/$m^3$ (over two times typical dust levels) for a consecutive 8-hour period.

During all on-site activities that could potentially produce dust, the Contractor will be responsible for making visual assessment of dust levels. If visible dust above background levels is present, an air-monitoring program for particulates will be conducted to assess potential impacts to ambient air due to these activities and the need for dust control measures. If determined necessary, the Contractor shall employ real-time aerosol monitors (Mini-rams) to ensure that generated airborne dust concentrations do not exceed the action level of 1.47 mg/m3.

This will provide real-time assurance that Site workers are not being exposed to lead concentrations in excess of the current OSHA/ACGIH exposure limit. If on any day the instantaneous dust concentration passing the miniram exceeds the monitors pre-set ring-off alarm level of 1.4 mg/m3, the device will alarm, letting the project safety officer and site supervisor know that the employed work and engineering controls are not adequate, and that intrusive work must be stopped until heightened dust-suppression methods are employed. All miniram daily average dust values will be recorded and retained, as will and daily maximum value that exceeds the action level of 1.4 mg/m3.

### B.10.2 Integrated Air Sampling

Based on the lead concentrations reported in the 2003 BSA, it is not anticipated that employee personal lead sampling will be necessary. However, this decision is left to the Contractor. If conducted, the sampling methodology should follow the current recommended NIOSH methodology. As of 2003, this is the following:

**Method:** NIOSH method #7300
**Equipment:** Battery operated personal sampling pump, calibrated before use
**Flow Rate:** Minimum 2 lpm, preferably higher to increase minimum detection level
**Media:** 0.8 mu 37mm Mixed Cellulose Ester Fiber Filter in closed face cassette, connected to tygon tubing
**Sample Stability:** Good, stable at room temperature indefinitely
**Laboratory:** Any that successfully participate in an AIHA Proficiency Analytical Testing (PAT) program.

Alternatively, high volume sampling may be used (for perimeter sampling) to increase method sensitivity, if a source of household electrical current is available, and security of the high volume stations is not an issue. If this option is selected, the Contractor should contact their selected lab for method guidance.

### B.10.3 Other Sampling

It is not considered likely that other monitoring (such as noise monitoring) shall be necessary. However, if other monitoring is deemed appropriate, all monitoring/sampling results shall be compared to "action levels" established in the HASP Hazard/Risk Analysis section, to determine validity of selected PPE, and adequacy of on-site dust-suppression controls.

## B.11 Standard Operating Safety Procedures and Work Practices

At a minimum, the HASP shall address the following elements:

- Site rules/prohibitions - buddy system, eat/drink/smoking restrictions, etc. It is essential that all workers exposed to particulate contaminants practice a high degree of personal hygiene, to prevent the ingestion (hand-to-mouth) of Site contaminants;
- Material handling procedures (contaminated soils, liquids);
- Underground and overhead utilities – must be identified prior to mobilization and avoided. Follow OSHA distance requirements, as presented in Table 5. Always maintain at least a 10 foot clearance from overhead powerlines, or have owner de-energize and lockout prior to approach;

**Table 5 - Minimum Clearance from Energized Overhead Electric Lines**

| NOMINAL SYSTEM VOLTAGE | MINIMUM REQUIRED CLEARANCE |
|---|---|
| 0-50 kV | 10 feet |
| 51-100 kV | 12 feet |
| 101-200 kV | 15 feet |
| 201-300 kV | 20 feet |
| 301-500 kV | 25 feet |
| 501-750 kV | 35 feet |
| 751-100 kV | 45 feet |

- Hot-work, sources of ignition, and electrical safety (ground-fault protection, cord inspection, overhead power line avoidance, etc.);
- Excavation safety;
- Material handling
- Machine guarding;
- Fall protection;
- Site illumination;
- Sanitation – solid waste collection & removal, Site generated hazwaste – PPE, etc. collection and disposal;
- Dust suppression engineering controls.

## B.12 Site Control Measures

The HASP shall include site map(s) containing work zone delineation and access points and shall describe on-site and off-site communications, security (physical and procedural), and general site access.

## B.13 Personal Hygiene and Decontamination

The HASP shall specify necessary facilities and their locations as well as detail standard operating procedures, frequencies, supplies, and materials to accomplish decontamination of site personnel. This is necessary o prevent contaminants being transported off-site, as well as preventing hand-to-mouth ingestion.

## B.14 Equipment Decontamination

The HASP shall specify necessary facilities, equipment, and their locations as well as detail procedures, frequencies, supplies and materials, and methods to determine adequacy for the decontamination of equipment used on-site. If power washing is proposed, present safety procedures to avoid injury.

## B.15 Emergency Response and Contingency Procedures

This section of the HASP shall contain an Emergency Response Plan in compliance with 29 CFR 1926.65(l), which addresses the following elements, as a minimum:

- Pre-emergency planning and procedures for reporting incidents to appropriate government agencies for potential chemical exposures, personal injuries, fires/explosions, environmental spills and releases, discovery of radioactive materials;
- Personnel roles, lines of authority, communications;
- Posted instructions and a list of emergency contacts: (physician, nearby medical facility, fire and police departments, ambulance service, federal/state/local environmental agencies, CIH, Contractor management);
- Emergency recognition and prevention;
- Site topography, layout, and prevailing weather conditions;
- Criteria and procedures for site evacuation (emergency alerting procedures/employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security and control);
- Specific procedures for decontamination and medical treatment of injured personnel;
- Route maps to nearest pre-notified medical facility;
- Criteria for initiating community alert program, contacts, and responsibilities, and
- Critique of emergency responses and follow-up.

## B.16 Logs, Reports and Recordkeeping

The following logs, reports, and records shall be developed, maintained, and submitted to the City at the conclusion of the site work:

- Training logs (site-specific, visitor);
- Daily safety inspection logs (may be part of the Daily QC Reports);
- Employee/visitor register, and
- Environmental and personal exposure monitoring/sampling results.

## B.17 Document Revisions, Addenda, and Field Modifications

While it is not the intent of the City to review the contractors HASP for technical accuracy, any comments issued by the client prior to HASP approval shall be incorporated by revising and reissuing affected pages. Minor changes affecting only a few pages may be made by addenda sheets and resubmitted.

Once on-site, unanticipated field conditions encountered which were not addressed in the approved HASP shall be immediately reported to the client field representative. Field activities in such areas shall be halted until the HASP has been modified to reflect changed conditions and reviewed/approved by the contractors hazardous waste site operations professional.

## B.18 Project Site Visitors

The Contractor shall continuously maintain on-site a minimum of four (4) sets of protective equipment (except for air-purifying respirators, prescription safety glasses, and safety shoes) for approved visitor usage. These ensembles shall include all PPE specified in the HASP. At least one set of protective clothing shall be size XX-large.

## B.19 Special Considerations

Where excavations and/or confined spaces (open excavations greater than 4 feet may be potential confined spaces) shall be entered, the contractor shall comply with all applicable portions of §1926.650-.652 and §1910.146.

Excavations for foundations or utilities at the site may encounter groundwater. To minimize the potential for negative impacts, the HASP shall include provisions for de-watering, discharge, and disposal processes.

If contaminated soil or water is encountered, the contractor shall adequately contain it and properly remove it from the site as soon as possible. The HASP shall establish soil and groundwater mitigation and control specifications for grading and construction activities, including health and safety provisions for monitoring exposure to construction workers, procedures to be undertaken in the event that previously unreported contamination is discovered, and emergency procedures and responsible personnel.

# Attachment D
# Examples of Institutional Controls

**EXAMPLE**

**CITY OF SIOUX FALLS, SOUTH DAKOTA**
**ORDNANCE NO. _____**

AN ORDINANCE OF THE CITY OF SIOUX FALLS, SOUTH DAKOTA, AMENDING THE MUNICIPAL CODE PROHIBITING THE USE OF GROUNDWATER FOR POTABLE PURPOSES WITHIN THE INSTITUTUIONAL CONTROL BOUNDARY.

WHEREAS, past commercial and industrial activities in the vicinity of Phillips Avenue Brownfield Site resulted in elevated levels of certain metals, polycyclic aromatic hydrocarbons, and other compounds in soil; and

WHEREAS, to ensure that potentially contaminated groundwater is not consumed for potable purposes, it is necessary for the public heath to prohibit such use; and

WHEREAS, the Sioux Falls City Council finds and determines that amending the Sioux Falls Municipal Code to require owners of property within the Phillips Avenue Brownfield Site to connect to the City's potable water supply is in the best interest of the citizen of Sioux Falls.

NOW, THEREFORE, THE COUNCIL OF THE CITY OF SIOUX FALLS, SOUTH DAKOTA, ORDAINS THAT:

1. The City Council incorporates the foregoing recitals as findings by the City Council.
2. Amendment. Title ___ of the Sioux Falls Municipal Code is hereby amended as follows:

xx.xx.xxx **Connection Required**

The owner of any building occupied for business or residence purposes, situated within the City and abutting any street, alley, or right-of-way in which there is now located or may in the future be located a water distribution main of the City, is required at such owner's expense to connect such building by means of a service line directly with the distribution main in accordance with the provisions of this chapter. Further, any such owner located within the Phillips Avenue Brownfield Site is prohibited from accessing groundwater for potable or non-potable purposes or from connecting groundwater in any way to the municipal water system. The point or points at which connection is made to the distribution main shall be determined by the City Engineer.

# Attachment D
# Examples of Institutional Controls

**This property is subject to an Environmental Covenant held by the City of Sioux Falls pursuant to section xxxxxxx.**

## ENVIRONMENTAL COVENANT

By this deed, the City of Sioux Falls grants an Environmental Covenant ("Covenant") this day of _____, 200_ to the South Dakota Department of Environment and Natural Resources ("the Department") pursuant to xx-xx-xxx.

WHEREAS, the City of Sioux Falls is the owner of certain property commonly referred to as Phillips Avenue Brownfield Site, more particularly described in Attachment A, attached hereto and incorporated herein by reference as though fully set forth, (hereinafter referred to as "the Property"); and

WHEREAS, past commercial and industrial activities in the vicinity of Phillips Avenue Brownfield Site resulted in elevated levels of certain metals, polycyclic aromatic hydrocarbons, and other compounds in soil; and

WHEREAS, the City of Sioux Falls desires to subject the Property to certain covenants and restrictions as provided in Article xx of Title xx, Sioux Falls Revised Statutes, which covenants and restrictions shall burden the Property and bind Sioux Falls, its heirs, successors, assigns, and any grantees of the Property, their heirs, successors, assigns and grantees, and any users of the Property; and

NOW, THEREFORE, the City of Sioux Falls hereby grants this Environmental Covenant to the Department and declares that the Property as described in Attachment A shall hereinafter be bound by, held, sold, and conveyed subject to the following environmental use restrictions, which shall run with the Property in perpetuity and be binding on the City of Sioux Falls and all parties having any right, title, or interest in the Property, or any part thereof, their heirs, successors, and assigns, and any persons using the land.

1. Use restrictions

   a. No residential or commercial development of the recreational park area shall be permitted without the express prior written consent of the City.
   b. No wells or drilling or pumping whatsoever shall be permitted or allowed in any groundwater or aquifer within the Property without the express written consent of the City.
   c. No excavation, grading, construction, or any other activity that disturbs the ground surface is permitted on the Property without the express written consent of the City.

2. Purpose of this Covenant. The purpose of this Covenant is to ensure protection of human health and the environment by minimizing the potential for exposure to any contaminants that remain on the Property. The Covenant will accomplish this by minimizing those activities that result in disturbing the ground surface and by creating a review and approval process to ensure that any such intrusive activities are conducted with appropriate precautions to avoid or eliminate any hazards.

3. Modifications. This Covenant runs with the land and is perpetual, unless modified or terminated pursuant to this paragraph. The City or its successors and assigns may request that the Department approve a modification or termination of the Covenant. The request shall contain information showing that the proposed modification or termination shall, if implemented, ensure protection of human health and the environment. The Department shall review any submitted information and may request additional information. If the Department determines that the proposal to modify or terminate the Covenant will ensure protection of human health and the environment, it shall approve the proposal. Information to support a request for modification or termination may include one or more of the following:

   a. A proposal to perform additional remedial work;
   b. New information regarding the risks posed by the residual contamination;
   c. Information demonstrating that residual contamination has diminished;
   d. Information demonstrating that the proposed modification would not adversely impact the remedy and is protective of human health and the environment; and
   e. Other appropriate supporting information.

4. Conveyances. This Covenant is intended to run with the land and shall be binding upon all subsequent owners of all or any part of the Property. The City shall notify the Department at least fifteen (15) days in advance of any proposed grant, transfer, or conveyance of any interest in any or all of the Property. The City agrees to incorporate either in full or by reference the restrictions of this Covenant in any leases, licenses, or any other instruments granting a right to use the property.

5. Binding Effect. Notwithstanding the foregoing, pursuant to xxx-xx, any person or entity who acquires any right, title, or interest in all or any part of the Property shall be conclusively deemed to have consented and agreed to the provisions of this Covenant, whether or not any reference to this Covenant or its provisions is contained in the deed or other conveyance instruments by which such person or entity acquires an interest in the Property.

6. Notification for proposed construction and land use. The City agrees to notify the Department simultaneously when receiving any application from a private entity or business for a building permit or change in land use.

# Attachment C
# Correspondence

# Attachment E
# EPA Brownfields Grant Documentation

The formal Administrative Record for this Cooperative Agreement is maintained by the City's Planning and Building Services Office.