November 18, 2009

Ms. Olivia Hough
City of Springfield
840 Boonville Avenue
Springfield, MO 65801

RE: Analysis of Brownfields Cleanup Alternatives (ABCA)
Jordan Valley West Meadows – Site #1
309 N Main Street
Springfield, Greene County, Missouri
Terracon Project No. B5097016A
EPA Cooperative Agreement BF-98796601-0 (cleanup)
Springfield Contract No. 2009-0982

Dear Ms. Hough:

Terracon Consultants, Inc. (Terracon) is pleased to submit this Analysis of Brownfields Cleanup Alternatives (ABCA) for Site #1 within Jordan Valley West Meadows. Terracon completed ABCA services in accordance with Terracon Proposal P02091165.

This ABCA is required under the United States Environmental Protection Agency's (USEPA's) Brownfields program prior to conducting cleanup actions with USEPA Brownfields funds. Conducted as part of Cleanup Planning under the cleanup grant, the ABCA must be signed by an authorized representative of the recipient (City of Springfield).

The ABCA is required by the USEPA's Brownfields program to include the following.

- Information about the site and contamination issues (e.g., exposure pathways, identification of contaminant sources, etc.), cleanup standards, applicable laws, alternatives considered, and the proposed cleanup

- Effectiveness, implementability, and the cost of the proposed cleanup

- An analysis of reasonable alternatives including no action. For cleanup of petroleum-only sites, an analysis of cleanup alternatives must include considering a range of proven cleanup methods including identification of contaminant sources, exposure pathways, and an evaluation of corrective measures. The cleanup method chosen must be based on this analysis.

This ABCA has been prepared consistent with the "abbreviated format" suggested by USEPA Region 7. Specifics regarding the technical details, feasibility, and cost estimates for various cleanup alternatives were previously provided in Terracon's *Evaluation of Cleanup Alternatives*

of the Jordan Valley West Meadows Area included as Section 7.0 in our *Site Investigation Report; West Meadows – BNSF Donation Property* (August 2008). The assessment and report were completed under USEPA-approved quality documents and sampling plans.

Background Summary

The Jordan Valley West Meadows area occupies approximately 14 acres of commercial and light industrial land in central Springfield, Missouri. The property includes a railroad corridor parcel that is present east from North Fort Avenue to North Grant Avenue, between West Phelps Street to the north and West College Street to the south.

The West Meadows area is currently unoccupied with several former concrete building foundations, multiple large piles of concrete, several piles of household refuse, and a few wooded areas. A segment of Jordan Creek intersects the eastern portion of the area and bounds the majority of the property on the south. Railroad properties bound the site on the north and south. Commercial and light industrial facilities bound the area on the east and west.

Site #1 occupies approximately 1.5 acres of an historical railroad corridor in central Springfield, Missouri. The property generally spans east and west from the N. Grant Avenue viaduct south of Jordan Creek and north of the MNA rail line. The address has recently been updated as 309 N. Main Street.

Available records for Site #1 suggest portions of Site #1 and surrounding land has consisted of the Frisco and now BNSF rail yards including several warehouses. The Site was historically part of a larger parcel that was used as a freight depot and warehouse by the St. Louis and San Francisco Railway Company from the late 1800s to the 1980s.

Previous Brownfields Phase I and Phase II Environmental Site Assessments for Site #1 have occurred under EPA Brownfield Assessment Grants and through Targeted Brownfield Assessments. Assessments completed for the City of Springfield were conducted using a USEPA-approved Quality Assurance Project Plan and Technical Sampling and Analysis Plans.

Terracon previously completed a Tier 1 Risk Assessment for Site #1 (Terracon Project Number 02087047) and is planning additional characterization for remedial design. The Tier 1 Risk Assessment indicated that residual soil concentrations of arsenic, lead, and benzo(a)pyrene are present above Tier 1 Risk-Based Target Level (RBTLs).

A technical work plan has been reviewed by the USEPA and the Missouri Department of Natural Resources (MDNR), and a revised technical work plan for characterization in support of remedial design is currently pending agency approval.

Community Relations and Public Involvement

Previous and on-going outreach has occurred relative to the West Meadows and Site #1. The City of Springfield implements a combined community relations process for all eight sites of the West Meadows, including Site #1. The approach to Site #1 incorporates the results of this process. The final design remedy will further incorporate community feedback from outreach activity.

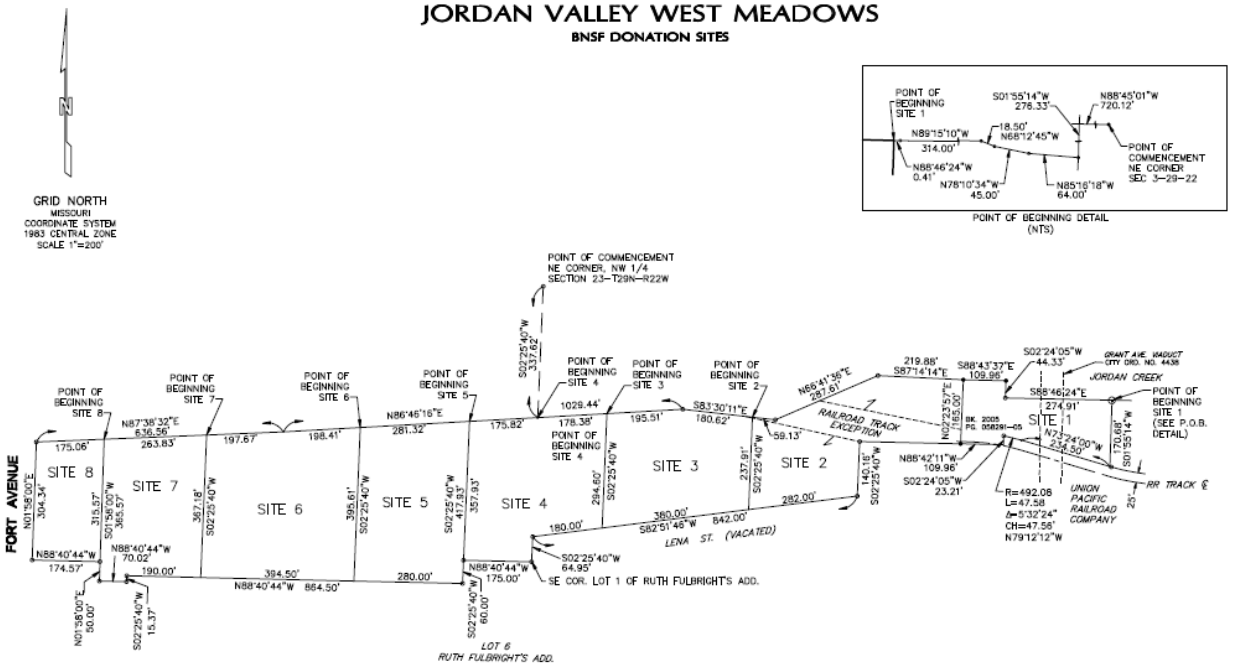
Future Use

Prospective area redevelopment generally includes open/green space designs for public use and surface drainage improvements via stormwater detention. Such improvements would likely require removal and alteration of existing surface drainage patterns. Site #1 future use will include green space leading into the larger West Meadows area to the west supporting modification to Jordan Creek for surface water management.

Future plans for the creek in the vicinity of Site #1 currently include potential expansion of the creek but do not include creek re-alignment or moving the creek. This may include removal of a portion of a concrete box culvert.

Site #1

As the following figure depicts, Site #1 is located towards the eastern portion of Jordan Valley West Meadows.



Source Area Characterization

Metals (primarily lead and arsenic) and benzo(a)pyrene are the primary contaminants of concern (COCs). These contaminants are consistent with various potential sources related to historical rail yard operations. Available data does not confirm specific contaminant point sources; however, the nature and extent of impacts are consistent with former rail yard operations.

Based on previous investigations, these COCs are located principally in the surface soils on Site #1 (surface soils are defined by the MDNR as located 0 to 3 feet below ground surface).

In Missouri, discrete sample results are initially compared to Tier 1 RBTLs. However, since receptors are generally exposed to average concentrations at contaminated sites, the MDNR allows the calculation of "representative concentrations" for comparison to the Tier 1 RBTLs for non-residential closure. Based on review of existing data and complete exposure pathways, the representative (average) concentration of benzo(a)pyrene is above the Tier 1 RBTL for Non-Residential Land Use (Soil Type 2) for the ingestion, inhalation (vapor emissions and particulates) and dermal contact surface soil cleanup criteria. The remaining representative concentrations (including some maximum concentrations) for COCs are below the applicable Tier 1 RBTLs for Non-Residential Land Use.

The City is proceeding with cleanup of West Meadows Site #1. Remedial design for Site #1 requires sampling and analysis to characterize impact for remedial design to estimate extent and quantities of materials requiring treatment and/or disposal as part of remediation design.

Cleanup Standards

The site is enrolled in the MDNR's Brownfields/Voluntary Cleanup Program (B/VCP) under the oversight of MDNR project manager Mr. Chris Cady, PhD. Cleanup of the site will be to applicable RBTLs developed using the procedures of the B/VCP. Remaining impact, if any, will be compared to these RBTLs for closure.

Cleanup Alternatives Considered

"No action," an alternative required by the USEPA for evaluation, was considered, but it does not protect human health or the environment based on the project needs of providing additional stormwater capacity for the City of Springfield. The City's future plans include excavation and re-grading of the site and the Jordon Valley West Meadows area. Additionally, the US Army Corp of Engineers (who is involved in the City's stormwater planning) requires a clean site evidenced by MDNR's certificate of completion and this cannot be obtained without taking some action on the site. For these reasons, the grantee and subgrantee is unable to implement a "no action" alternative.

Other than "no action," the alternatives evaluated included the following.

- Excavation to Residential Standard
- Excavation to Non-Residential Standard
- Risk-Based Management

Terracon evaluated these cleanup alternatives based on a previous evaluation discussed in the August 21, 2008, Site Investigation Report for Site #2 through Site #8. The following table provides a summary of the aggregate range of costs estimated for cleanup alternatives implemented either simultaneously or in stages for Site #2 through Site #8 (located directly west of the Site#1) from the evaluation of cleanup alternatives within the August 2008 Site Investigation Report. This previous cleanup evaluation was used as the contaminants of concern and impacted media (soils) are similar across Site #1 through Site #8. The future use of green space and stormwater management is similar as well.

Cost Analysis of Brownfields Cleanup Alternatives
Jordan Valley West Meadow Site #2 through Site #8
(From August 2008 Site Investigation Report)

Alternatives	Range of Modeled Cost	
Excavation to Residential Standard	$5,278,000	$7,917,000
Excavation to Non-Residential Standard	$2,675,000	$4,012,000
Risk-Based Management	$1,209,000	$1,814,000

These cost ranges do include but do not reflect specific Site #1 costs, but show the cost differential between the alternatives evaluated.

Based on effectiveness of protecting human health and the environment, implementablity, and cost, the recommended cleanup alternative was **risk-based corrective action and management** scenarios for sites #2 through #8. As the surface soils, not including subsurface soils, are present with the elevated concentrations at Site #1, it may be feasible and cost effective to remove impacted soils from the site either to residential or non-residential standards. However, additional characterization data for remedial design is still pending.

This risk-based corrective action and management approach would manage residual contamination through removal primarily or encapsulation using clean fill and vegetative coverage. Additionally, this approach could continuously evolve and adapt to pending redevelopment planning and associated grade and construction designs.

Advantages

- Removal of most concentrated source area(s);
- Cost effective and practical;
- Cleanup efforts include proven and easily applied remediation strategies;
- Includes risk-based corrective action and management consistent with B/VCP requirements;
- Costs could be further reduced through cooperative landfill agreements (e.g. reduced tipping fees) and/or alternative disposal such as beneficial reuse of non-permitted fills with appropriate restrictions;
- No ongoing remediation system operation and maintenance costs, excluding routine cap inspections and landscaping; and
- Approach is consistent with current redevelopment planning and community and neighborhood vision.

Disadvantages

- Soil encapsulation and risk-based management would restrict land use and likely warrant deed restrictions and/or institutional controls;
- Future site improvements would likely require soil management plans and appropriate contingency planning; and
- Engineered cap would require ongoing inspections, maintenance, and regulatory oversight.

Recommended Cleanup for Site #1

Future redevelopment generally includes open/green space designs for public use and surface drainage improvements via stormwater capacity. Based on a draft grading plan prepared by the City of Springfield, Site #1 future use will include green space leading into the larger West Meadows area to the west supporting modification to Jordan Creek for surface water management.

This final use would require some removal and potential encapsulation of residual contamination. Excavated soil would be transported to a landfill or to other portions of the Jordan Valley West Meadows for management and potential encapsulation. Beneficial reuse of excavated soils as fill on any of the other sites in West Meadows will be carefully documented and conducted only with MDNR B/VCP approval.

The risk-based site cleanup activities will be completed according to specifics and procedures documented in site cleanup plans. Additionally, site-specific engineering costs will be prepared as part of the cleanup planning to assist the City of Springfield in bidding cleanup activities and review of bids. The cleanup plan will be completed as a separate document and will be approved by the MDNR prior to implementation of site cleanup activities.

Please contact me at (913) 492-7777 or ejgorman@terracon.com if you have any questions regarding this ABCA. Terracon looks forward to our continued relationship.

Sincerely,
TERRACON CONSULTANTS, INC.

Eric Gorman For:
Brian Porter, P.E.
Environmental Department Manager

Eric J. Gorman P.G.
Assistant Department Manager –
Environmental Services

CITY OF SPRINGFIELD

Olivia Hough
Senior Planner/Brownfields Coordinator
Department of Planning and Development

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