

October 9, 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 #4
Springfield, Greene County, Missouri
Terracon Project No. B5097016B
EPA Cooperative Agreement BF-98788001 (RLF cleanup subgrant)
Springfield Contract No. 2007-0323

Dear Ms. Hough:

Terracon Consultants, Inc. (Terracon) is pleased to submit this Analysis of Brownfields Cleanup Alternatives (ABCA) for Site #4 within Jordan Valley West Meadows. Terracon completed ABCA services in accordance with Terracon Proposal P02090885.

This ABCA is required by recipients under the United States Environmental Protection Agency's (USEPA) Brownfields program. The ABCA must be signed by an authorized representative of the recipient (City of Springfield).

The ABCA is required by the USEPA's EPA Brownfields program to include:

- 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 brownfield 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 Region 7 United States Environmental Protection Agency (USEPA). 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*



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Geotechnical



Environmental



Construction Materials



Facilities

Property (August 2008). The assessment and report were completed under an EPA-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 spans east from North Fort Avenue to North Grant Avenue, between West Phelps Street to the north and West College Street to the south.

The 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. Additional railroad properties bound the site on the north and south. Commercial and light industrial facilities bound the area on the east and west.

Historical records generally indicate initial development of the area as a railroad maintenance facility prior to 1896. Most associated structures were apparently removed prior to 1960. Available records further suggest operation of a concrete batch facility from the mid 1970s through 1995. These historical operations are corroborated by on-site observations of several concrete mounds throughout the site. The site has been vacant since 2001.

Community Relations and Public Involvement

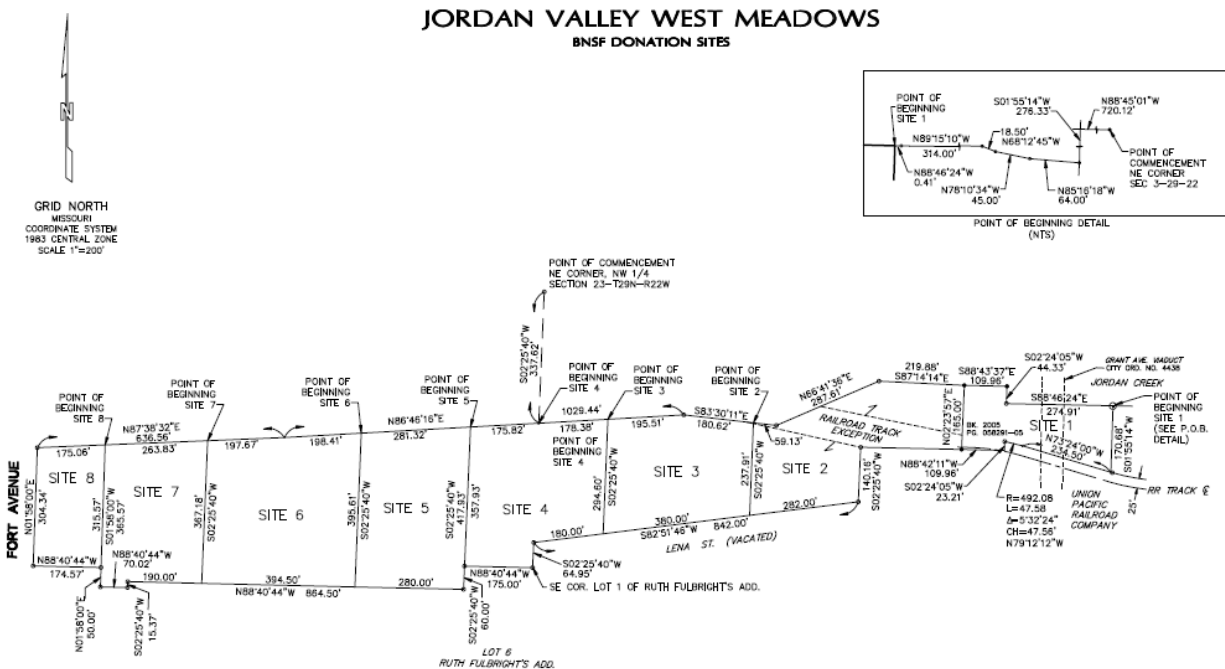
Previous and on-going outreach has occurred relative to the West Meadows and Site #4. The City of Springfield enacts a combined community relations process for all eight sites of the West Meadows, including Site #4. The approach to Site #4 incorporates the results of this process. The final design remedy 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/or regrading of most existing surface structures and alteration of existing surface drainage patterns. Site #4 future use will generally include a portion of the stormwater retention and detention features on the central and eastern portion of Site #4.

Site #4

Site #4 is located towards the central portion of Jordan Valley West Meadows as shown below.



Source Area Characterization

Metals (primarily lead and arsenic) and benzo(a)pyrene are the primary contaminants of concern. These contaminants are consistent with various potential sources related to historical rail yard operations. Available data do not confirm specific contaminant point sources; however, the nature and extent of impacts are consistent with former rail yard operations that reportedly included paint booth, locomotive maintenance, machine shop, and various related facilities.

Surface, near surface, and subsurface soil impacts were identified at various depths generally above an elevation contour of 1248 feet ASL. These depths correlate with below ground surface (bgs) intervals ranging from approximately 0 to 11 feet. Soil detections above Missouri Tier 1 risk based target levels (RBTLs) correlate well with documented areas of non-native fill and debris likely associated with decades of industrial fills and grade modifications.

Concentrations above both residential and non-residential RBTLs have been identified in surface and subsurface soils, and associated impacts are widespread.

Cleanup Standards

The site is enrolled in the MDNR B/VCP and is under the MDNR B/VCP oversight of 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.

The MDNR has established Tier 1 RBTLs for various exposure pathways that can be applied at sites with little to no site-specific information. These Tier 1 RBTLs are based on soil type and land use (including any restrictions).

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 storm water capacity for the City of Springfield. The City of Springfield’s future plans includes excavation and re-grading of the site and Jordon Valley West Meadows area. Additionally, the US Army Corp of Engineers (who is involved in the City’s storm water planning) requires a clean site based on MDNRs 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:

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

The following table provides a summary of the aggregate range of costs estimated for cleanup alternatives implemented either simultaneously or in stages for all seven sites (Site #2 through Site #8) from the evaluation of cleanup alternatives within the August 2008 Site Investigation Report.

**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 |
| Concrete Demolition and Removal | \$1,073,000 | \$1,609,000 |

These cost ranges do include but do not reflect specific Site #4 costs, but show the cost differential between the alternatives evaluated.

Based on effectiveness of protecting human health and the environment, implementability, and cost, the recommended cleanup alternative was **risk-based corrective action and management** scenarios. This approach would removes or encapsulates contaminants while managing residual impacts through clean fill and vegetative coverage. Potential exposure pathways are mitigated without the escalated cost and liabilities tied to larger volume removals. 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 scenario evaluated;
- 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 #4

Future redevelopment generally includes open/green space designs for public use and surface drainage improvements via stormwater detention. Based on draft grading plan by the City of Springfield, Site #4 future use will generally include part of the stormwater retention and detention feature on its central and eastern portion. This will include excavation of impacted soils at the site based on feasible site redevelopment grading plans, followed by transportation of the soils to a landfill or to other portions of Jordan Valley West Meadow 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.

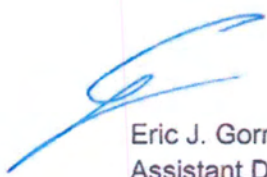
The risk-based site cleanup activities will be completed according to specifics and procedures documented in site cleanup plans. Additionally, site-specific engineering costs will be prepared as part of the cleanup planning to assist the City of Springfield in bidding cleanup activities and review of 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 the ABCA discussed within. Terracon looks forward to this continued relationship with you and the City of Springfield.

Sincerely,
TERRACON CONSULTANTS, INC.



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