TETRA TECH

September 12, 2013

Mr. Todd Davis
Site Assessment Manager
U.S. Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

Subject: Analysis of Brownfields Cleanup Alternatives
Kuhlman Diecasting Site, Stanley, Kansas
U.S. EPA Region 7, START 3, Contract No. EP-S7-06-01, Task Order No. 0002.015.024
Task Monitor: Todd Davis, EPA Project Manager

Dear Mr. Davis:

Tetra Tech, Inc. is submitting the attached Analysis of Brownfields Cleanup Alternatives (ABCA) report regarding the Kuhlman Diecasting site in Stanley, Kansas. If you have any questions or comments, please contact the project manager at (816) 412-1937.

Sincerely,

Jeff Pritchard, CHMM
START Project Manager

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Enclosures

cc: Roy Crossland, START Project Officer (cover letter only)

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ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES

KUHLMAN DIECASTING SITE, STANLEY, KANSAS

Superfund Technical Assessment and Response Team (START) 3

Contract No. EP-S7-06-01, Task Order No. 0002.015.024

Prepared For:

U.S. Environmental Protection Agency
Region 7
Superfund Division
11201 Renner Boulevard
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September 12, 2013

Prepared By:

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1.0 INTRODUCTION

The Tetra Tech, Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) 3 was tasked to complete an Analysis of Brownfields Cleanup Alternatives (ABCA) for the Kuhlman Diecasting site in Stanley, Kansas. This ABCA examines alternatives for cleanup of asbestos-containing materials (ACM) and lead-based paint (LBP) identified at the site. Additionally, the ABCA addresses contaminated soil and groundwater identified at the site during past investigations. Preliminary cost estimates for cleanup are also included as part of the ABCA. It should be noted that costs are for Brownfields-funded cleanup activities conducted under the state voluntary cleanup program.

2.0 SITE LOCATION AND DESCRIPTION

The Kuhlman Diecasting site is near the southwestern edge of Stanley, Johnson County, Kansas. The site property is currently owned by the Kuhlman Diecasting Company (Kuhlman) and consists of a defunct electroplating facility that covers approximately 35.15 acres, bounded west and south by the Blue River. The site address is 16400 Mission Road, which is near the intersection of 164th Street and Mission Road. The site can be accessed off Mission Road via a gravel road that connects to West 163rd Street. The site hosts a single-story, concrete block warehouse building that encompasses 73,730 square feet (ft^2). In addition, the site includes two process water storage basins, two wastewater evaporation sanitary lagoons, three capped lagoons (surface impoundments), and a pond (see Appendix A, Figures 1 and 2). The site is surrounded by a levee constructed to provide flood control. A railroad line bisects the site in a north-south direction.

The site is included on the Stillwell, Kansas, U.S. Geological Survey (USGS) 7.5-minute topographic series map (USGS 1991) (see Appendix A, Figure 1). The site is in Section 16, Township 14 South, Range 25 West. Coordinates of the approximate center of the site are 38.830741 degrees north latitude and 94.633464 degrees west longitude.

Site operations have included bulk oil storage/transfer, grain storage, and electroplating. Property information from the Johnson County Assessor website indicates the on-site building was constructed in 1904 (Environmental International Government Ltd. [EIGov] 2011). Historical photographs show seven large aboveground storage tanks (AST) at the site dating back to 1941. Kuhlman began electroplating operations at the site in 1962 and manufactured zinc diecastings for a variety of commercial and industrial customers. Kuhlman operations consisted of an electroplating process that involved chromium, nickel, and copper plating on zinc diecastings. On November 30, 1990, Kuhlman ceased all operations and filed for bankruptcy.

At the request of the Johnson County Government, EPA has conducted several investigations (Targeted Brownfields Assessments [TBA]) at the site since 2011. The Johnson County Government is interested in obtaining the property to demolish the site building, which is considered a dangerous building. It has been proposed that the remainder of the property be used for recreational purposes.

3.0 POTENTIAL CLEANUP ALTERNATIVES

The overall goal of any Brownfields cleanup action is to address environmental conditions preventing or impeding the preferred type of site redevelopment, and to do so in a manner protective of human health and the environment. Future plans for the site involve demolition of the site building; therefore, the discussed cleanup alternatives are based on demolition of that structure.

The purpose of the ABCA is to present viable cleanup alternatives based on site-specific conditions, technical feasibility, and preliminary cost evaluations. Brownfields cleanup alternatives were evaluated for the site to address specific environmental impacts/contaminants identified in past investigations. The environmental contaminants addressed in the ABCA were primarily investigated/identified in an Asbestos and LBP Survey Report (Survey Report) completed by EIGov (under contract to EPA) in November 2011, as well as in two Phase II TBA Reports. Both Phase II TBAs were completed for EPA—the first by Seagull Environmental Technologies, Inc., (Seagull) in September 2012 (referred to as the September 2012 Phase II TBA), and the other by Tetra Tech in August 2013 (referred to as the August 2013 Phase II TBA) (Seagull 2012 and Tetra Tech 2013). Those reports identified ACM and LBP, as well as soil (including sediment) and groundwater contamination at the site. The following sections describe Brownfields cleanup alternatives for addressing the ACM, LBP, and contaminated soil/groundwater, including a "No Action" alternative. Following the description of each material, cleanup alternatives are evaluated in terms of their effectiveness, implementability, and cost.

Past investigations have identified site-related contaminants in both soil (including sediment in on-site lagoons) and groundwater. Future use of the site and regulatory officials will determine the need for any remedial actions to address the soil and groundwater contamination.

The effectiveness of an alternative refers to its ability to meet the objectives of the Brownfields cleanup. Specific criteria used to assess the effectiveness of an alternative include the following:

- Overall protection of public health and the environment
- Compliance with applicable or relevant and appropriate requirements (ARAR) and other criteria, advisories, and guidance
- Long-term effectiveness
- Reduction of toxicity, mobility, or volume through treatment/removal
- Short-term effectiveness.

The implementability criterion addresses the technical and administrative feasibility of implementing an alternative, and availability of various services and materials required during its implementation. Specific criteria used to assess implementability of an alternative are:

- Technical feasibility
- Administrative feasibility
- Availability of services and materials
- State acceptance
- Community acceptance

Each alternative has been evaluated to determine its estimated cost. The evaluations compare each alternative's direct capital costs, which include equipment, services, and contingency allowances. The purpose of evaluating each alternative is to determine its advantages and disadvantages relative to the other alternatives in order to identify key tradeoffs that would affect selection of the preferred alternative.

3.1 EVALUATED CONTAMINATION

Contaminants and items potentially containing hazardous materials evaluated as part of this ABCA include ACM and LBP, as future plans for the site involve demolition of the site building and use of the property for recreational purposes. Additionally, contaminated soil/groundwater is addressed through implementation of institutional controls. The sections below discuss the ACM, LBP, and contaminated soil/groundwater identified during previous investigations at the site.

3.1.1 Asbestos-containing Materials

During the ACM survey, EIGov collected 60 samples of building materials suspected to contain ACM for laboratory analysis. Ten materials were determined to contain asbestos—transite debris, transite board, transite roof paneling, roofing material, tar paper, roof tar, sprayed-on thermal system insulation (TSI), door glaze (door windows), vinyl floor tile, and ceramic tile mastic. In those materials, asbestos (chrysotile) was detected at concentrations that ranged from 3 to 20 percent (%). EPA defines ACM as any material containing asbestos at a concentration above 1%. Table 1 summarizes the ACM identified at the site.

TABLE 1

ASBESTOS-CONTAINING MATERIALS
KUHLMAN DIECASTING SITE, STANLEY, KANSAS

Material	Location	Estimated Quantity	Asbestos Result (%) and Type
Transite Debris	Debris Piles – Throughout Building	10 yd^3	15% Chrysotile
Ceramic Tile Mastic	Bathroom – Eastern Portion	120 ft^2	5% Chrysotile
Window Glaze (Door Windows)	Door Windows – Eastern Portion	90 lf	3% Chrysotile
Roofing Material	Debris Piles – West Loading Dock Area	5 yd^3	15% Chrysotile
Tar Paper	Debris Pile – Northwest Portion	15 yd^3	20% Chrysotile
Roof Tar	Roof Flashing	Unknown	15% Chrysotile
Transite Roof Panels	Roof	34,000 ft^2	15% Chrysotile
TSI – Sprayed On	Under Transite Board Roof	25,000 ft^2	10% Chrysotile
Floor Tile	Bathroom – West Side	200 ft^2	7% Chrysotile
Transite Board	Bathroom – West Side	100 ft^2	20% Chrysotile

Notes:

ft^2	Square feet	yd^3	cubic yards
lf	Linear feet	%	Percent
TSI	Thermal system insulation		

3.1.2 Lead-based Paint

The LBP inspection was completed using an x-ray fluorescence (XRF) spectrometer. Considered LBP were paint-covered surfaces indicated by the XRF spectrometer to contain lead at a concentration equal to or exceeding (>) 1 milligram per square centimeter (mg/cm^2). LBP was identified on two interior surfaces at the site building—on a metal boiler and a stone wall. Those surfaces yielded XRF results for lead >2.0 mg/cm^2, and were found to be in poor condition (EIGov 2011). No other surface at any of the other site buildings was identified to contain LBP. Table 2 below summarizes the materials determined to contain LBP during the LBP inspection.

TABLE 2

MATERIALS CONTAINING LEAD-BASED PAINT
KUHLMAN DIECASTING SITE, STANLEY, KANSAS

Material	Location	XRF Reading (mg/cm^2)	Estimated Quantity	Condition
Metal Boiler – Orange Paint	Boiler Room – Southwest Corner of Building	2.25	500 ft^2	Poor
Stone Wall – Green Paint	Central Portion of Building – Base of Wall	2.30	2,800 ft^2	Poor

Notes:

ft^2 Square feet
mg/cm^2 Milligrams per square centimeter
XRF X-ray fluorescence

3.1.3 Contaminated Soil and Groundwater

Recently, two separate Phase II TBAs were completed for the site—the Seagull Phase II TBA in September 2012 and the Tetra Tech Phase II TBA in August 2013. Phase II TBA activities included collection of soil (subsurface and surface), groundwater, surface water, and sediment samples at locations geographically covering the site. Sampling results from the Phase II TBAs did not indicate widespread contamination across the site; however, elevated levels of volatile organic compounds (VOC) and petroleum-related contaminants were detected in both soil and groundwater at some direct-push technology (DPT) boring locations. Specifically, chlorinated VOCs were detected at concentrations up to 384 micrograms per liter (μg/L) in groundwater samples collected within the southwest portion of the site, just east of the wastewater evaporation sanitary lagoons and near the surface impoundments (see Appendix A, Figure 2). Many of the VOCs were detected at concentrations well above their respective Kansas Department of Health and Environment (KDHE) Risk-Based Values (RSK).

Additionally, two areas of petroleum-contaminated soil were identified—one on the east portion of the site and the other on the southwest portion. Total petroleum hydrocarbons (TPH) (both gasoline range organics and diesel range organics) were detected within those areas at elevated concentrations (above their respective KDHE RSK values) in subsurface soil. Presence of TPH is likely associated with historical site operations involving bulk petroleum storage/transfer.

Additionally, the September 2012 Phase II TBA determined that sediment in the wastewater evaporation lagoons within the southwest portion of the site contained elevated concentrations of metals. Past investigations also had determined that elevated levels of metals remained within one of the surface impoundments (Lagoon #3) at the northwest corner of the site.

3.2 EVALUATION OF CLEANUP ALTERNATIVES

Evaluations of cleanup alternatives identified two options for ACM, two options for LBP, and two options for contaminated soil and groundwater. The evaluations specifically considered KDHE Voluntary Cleanup Program procedural requirements because cleanup projects implemented with EPA Brownfields Cleanup funding require participation in a state voluntary cleanup program (or equivalent). For reference, fees associated with enrollment into the KDHE Voluntary Cleanup Program include a $200 application fee and refundable oversight deposit up to $5,000.

3.2.1 Asbestos-containing Materials

For ACM, two options were evaluated: (1) no action, and (2) proper abatement.

Alternative 1: No Action

Alternative 1 (no action) would consist of leaving ACM in place at the site.

Effectiveness

This alternative would not be effective regarding redevelopment or demolition of the site building. In accordance with National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations, demolition of the site building could not be conducted prior to proper abatement. This alternative would also be ineffective in achieving the goal of reduction of health risks.

Implementation

Implementation of this alternative is straightforward—the ACM would be left in place. Future redevelopment would have to consider the location and condition of the ACM and ensure those materials would not be disturbed. Demolition could not be conducted prior to abatement.

Cost

This alternative would not involve any direct costs.

Alternative 2: Abatement of Asbestos-containing Material

Alternative 2 would involve proper abatement of the ACM identified at the site. This alternative would be most appropriate for future plans that include demolition of the site building. Abatement would be conducted in accordance with applicable local, state, and federal regulations by a registered asbestos abatement contractor. Regulatory clearance would be obtained through successful implementation of a pre-approved Remedial Action Plan (RAP), including clearance sampling and pre/post-abatement inspections by KDHE (if necessary).

Effectiveness

Assuming removal of all identified ACM, Alternative 2 would be most effective in removing the risk to human health posed by the ACM. In addition, full abatement would allow for demolition of the site building without restrictions concerning disturbance of ACM.

Implementation

Abatement would proceed in accordance with applicable local, state, and federal regulations by a registered asbestos abatement contractor. Full abatement would include complete removal of the 10 materials identified as ACM (listed in Table 1 above and Table 3 below).

Cost

Estimated abatement costs were gathered from local vendors. Costs per linear foot, cubic yard (yd^3), and ft^2 are provided, and include removal and disposal costs. Table 3 below summarizes the abatement costs.

TABLE 3

ACM ABATEMENT COSTS
KUHLMAN DIECASTING SITE, STANLEY, KANSAS

Material	Location	Estimated Quantity	Cost/Unit	Total Cost
Transite Debris	Debris Piles – Throughout Building	10 yd^3	$250.00	$2,500.00
Ceramic Tile Mastic	Bathroom – Eastern Portion	120 ft^2	$4.50	$540.00
Window Glaze (Door Windows)	Door Windows – Eastern Portion	90 lf	$8.00	$720.00
Roofing Material	Debris Piles – West Loading Dock Area	5 yd^3	$350.00	$1,750.00
Tar Paper	Debris Pile – Northwest Portion	15 yd^3	$350.00	$5,250.00
Roof Tar	Roof Flashing	100 ft^2*	$4.50	$450.00
Transite Roof Panels	Roof	34,000 ft^2	$2.50	$85,000.00
TSI – Sprayed On	Under Transite Board Roof	25,000 ft^2	$18.00	$450,000.00
Floor Tile	Bathroom – West Side	200 ft^2	$2.25	$450.00
Transite Board	Bathroom – West Side	100 ft^2	$1.50	$150.00
			Total ACM Abatement Cost	**$546,810.00**

Notes:

* The quantity of roof tar is not known; however, a quantity of 100 ft^2 was assigned for cost estimate purposes.

ACM Asbestos-containing material
ft^2 Square feet
lf Linear feet
TSI Thermal system insulation
yd^3 Cubic yard

Total abatement cost for all ACM is estimated at $546,810. Additional costs to be considered include technical reports (RAP and Final Cleanup Report) and clearance sampling and analysis. Estimated costs for technical plans/reports are $2,500 per plan/report (cost of plans includes consideration of all environmental issues to be addressed by cleanup activities). Clearance sampling would not be necessary because of demolition of the site building.

Notably, most costs are for abatement of TSI associated with the transite roof panels. That ACM was identified in one sample collected during the inspection (additional samples were not analyzed based on the positive result). A visual inspection of the transite ceiling panels during the August 2013 Phase II TBA did not identify the TSI, suggesting the material may not be as widespread as indicated in the inspection report. Additional sampling and characterization to further determine locations and quantities of asbestos-containing TSI is recommended prior to abatement activities. The additional sampling should also include quantitative determination of the roof tar determined to be ACM. Importantly, the building's roof is not safely accessible due to its deteriorated condition, which is the reason a quantity of roof tar was not provided and further investigation of the TSI associated with the transite roof panels did not occur. Therefore, hydraulic man lifts and/or scaffolding may be required to safely inspect the roof.

3.2.2 Lead-based Paint

Two cleanup alternatives were evaluated to address LBP found on structures associated with the site building. The two options were: (1) no action, and (2) removal through demolition. Implementing the removal through demolition option would be acceptable under the KDHE Voluntary Cleanup Program.

Alternative 1: No Action

Alternative 1 (no action) would consist of leaving LBP in place at the site.

Effectiveness

This alternative would not be effective regarding redevelopment of the property. Proposed redevelopment of the areas containing LBP would be restricted to ensure those materials would not be disturbed. This alternative would also be ineffective in achieving the goal of reduction of health risks.

Implementation

Implementation of this alternative is straightforward—the LBP would be left in place. Redevelopment would have to consider locations and condition of the LBP, and ensure those materials would not be disturbed.

Cost

This alternative would not involve any direct costs.

Alternative 2: Lead-based Paint Removal by Demolition

This alternative would be most applicable to directly address the LBP prior to demolition (if desired). Notably, if demolition of the building is planned, removal of the LBP prior to demolition is not required (i.e., the LBP components can be demolished and disposed of with the other building materials). Alternative 2 includes stabilization of LBP in poor condition (chipping, flaking, etc.) and removal (by demolition) for proper disposal. Stabilization involves scraping the surface to remove loose paint chips. The condition of LBP-containing surfaces should be inspected, followed by required removal of loose (chipped, flaking, etc.) LBP. The removed LBP residue should be segregated for proper disposal. All surfaces/components that contain LBP determined to be in good condition can be removed/demolished and disposed of as demolition waste. Implemented removal/demolition techniques cannot chip, shred, mulch, or mill the LBP.

This alternative is a direct approach, because LBP would be removed, and controls would not be required to manage LBP left in place when redevelopment occurs. Materials containing LBP would be removed and disposed of off site as special (demolition) waste. LBP residue removed during stabilization would be disposed of as hazardous waste. Disposal characterization testing would be required prior to disposal.

Effectiveness

If all identified LBP is removed, Alternative 2 would be most effective in removing the risk to human health posed by the LBP. This alternative would allow for demolition/renovation of the building without restrictions concerning disturbance and management of LBP.

Implementation

Stabilization and removal would proceed in accordance with applicable state and federal regulations. Segregation and proper disposal (likely as hazardous waste) of LBP residue removed during stabilization activities would be required. Based on the quantity of LBP at the site, the volume of paint residue is expected to be fully contained within a 5-gallon bucket. This technique can generate a hazardous waste stream, and requires careful consideration of precautions concerning worker health and safety.

<u>Cost</u>

Estimated abatement costs were gathered from local vendors. Table 4 below summarizes the abatement costs.

TABLE 4

LBP ABATEMENT COSTS – REMOVAL/DEMOLITION
KUHLMAN DIECASTING SITE, STANLEY, KANSAS

Material	Location	Estimated Quantity	Cost/Unit	Total Cost
Metal Boiler – Orange Paint	Boiler Room – Southwest Corner of Building	500 ft^2	$4.00	$2,000
Stone Wall – Green Paint	Central Portion of Building – Base of Wall	2,800 ft^2	$2.00	$5,600
			Total LBP Abatement Cost	**$7,600**

Notes:

ft^2 Square feet
LBP Lead-based paint

Total abatement cost for the discussed LBP is estimated at $7,600. Additional costs to be considered include technical reports (RAP and Final Cleanup Report). Estimated costs for technical plans/reports are $2,500 per plan/report (cost of plans include consideration of all environmental issues to be addressed by cleanup activities). Clearance sampling would not be necessary because the site building would be demolished.

3.2.3 Soil and Groundwater

For soil and groundwater contaminants identified at the site, two options were evaluated: (1) no action, and (2) implementation of institutional controls (as known as Environmental Use Controls).

<u>Alternative 1: No Action</u>

Alternative 1 (no action) would consist of not addressing soil and groundwater contamination identified at the site.

Effectiveness

If the site would be enrolled in the KDHE Voluntary Cleanup Program, all environmental media at the site (soil, groundwater, ACM, LBP, etc.) would be evaluated. Not addressing the identified contamination could impede future use (or redevelopment) of the site.

Implementation

Implementation of this alternative is straightforward—soil and groundwater contamination would not be addressed.

Cost

This alternative would not involve any direct costs.

Alternative 2: Implementing Institutional Controls

Implementation of institutional controls would primarily consist of creating a restrictive covenant concerning site use and future construction/development at the site. This covenant could be approved by the KDHE Voluntary Cleanup Program.

Effectiveness

This alternative could effectively allow the site to gain a certificate of completion through the KDHE Voluntary Cleanup Program. A justification for this restrictive covenant would be reached after evaluation of soil and groundwater sample results from past investigations at the site.

Implementation

Implementation of this alternative would require establishing a restrictive covenant approved by the KDHE Voluntary Cleanup Program. Future use and restrictive development of the site would be determined after evaluation of environmental contamination identified at the site.

Cost

Costs associated with this alternative would include technical reporting and correspondence with KDHE. Currently, KDHE requires payment that can range from $2,000 and up (depending on size and complexity) per site to gain approval of such a restrictive covenant. This fee allows for long-term oversight of the site, site records, and documentation. In addition, document preparation could cost up to $10,000; therefore, total cost for this alternative can range from $12,000 upward. For the purposes of this ABCA, the estimated cost for this alternative is $25,000.

3.3 RECOMMENDED CLEANUP ALTERNATIVES

Asbestos-containing Material

Alternative 2—abatement of ACM wastes—is the recommended cleanup alternative for ACM identified at the site. Alternative 2 would be effective in removing ACM at the site, as well as removing the risk to human health posed by the ACM. In addition, this alternative would allow for redevelopment of the site without restrictions concerning disturbance of ACM.

Lead-based Paint

Alternative 2—removal by demolition—is the recommended cleanup alternative for LBP identified at the site. The costs provided are specific to removal of the LBP-containing components/items prior to demolition. As previously mentioned, if the building is to be demolished and properly disposed of, removal of the LBP prior to demolition would not be required. The LBP-containing components/items would be considered part of the demolition waste.

Soil and Groundwater

Alternative 2—implementation of institutional controls—is the recommended cleanup alternative for soil and groundwater contamination identified at the site. This would be the recommended (and required) alternative if the site would be enrolled in the KDHE Voluntary Cleanup Program. This alternative could effectively allow acquisition of a certificate of completion for the site through the KDHE Voluntary Cleanup Program.

3.3.1 Total Cleanup Cost

Based on the recommended cleanup alternatives for ACM, LBP, and soil/groundwater, the estimated total cleanup cost is $591,610. This includes site enrollment in the KDHE Voluntary Cleanup Program and fees associated with preparation of required technical plans/reports. Full abatement of the ACM is estimated at $546,810. A combination of stabilization and removal (by demolition) of the LBP is estimated at $7,600. Implementing institutional controls (Environmental Use Controls) is estimated at $25,000. Site enrollment fees into the KDHE Voluntary Cleanup Program are $5,200, while fees associated with preparation of technical reports would be $5,000 ($2,500 each for a RAP and Final Cleanup Report). Table 5 summarizes these costs.

TABLE 5

SUMMARY OF COSTS
KUHLMAN DIECASTING SITE, STANLEY, KANSAS

Contaminant/Material	Recommended Alternative	Action – Cost	Total Cost
ACM	Alternative 2 – Abatement	Abatement - $546,810	$546,810
LBP	Alternative 2– Removal of LBP	Removal (by demolition) - $7,600	$7,600
Soil and Groundwater	Alternative 2 – Institutional Controls	Associated Fees/Covenant - $25,000	$25,000
KDHE Voluntary Cleanup Program Fees			$5,200
Technical Plan Preparation (RAP and Final Cleanup Plan)			$5,000
		Total Cost	**$589,610**

Notes:

ACM Asbestos-containing materials
KDHE Kansas Department of Health and Environment
LBP Lead-based paint
RAP Remedial Action Plan

4.0 REFERENCES

Environment International Government Ltd (EIGov). 2011. Phase I Environmental Site Assessment, Kuhlman Diecasting site, Stanley, Kansas.

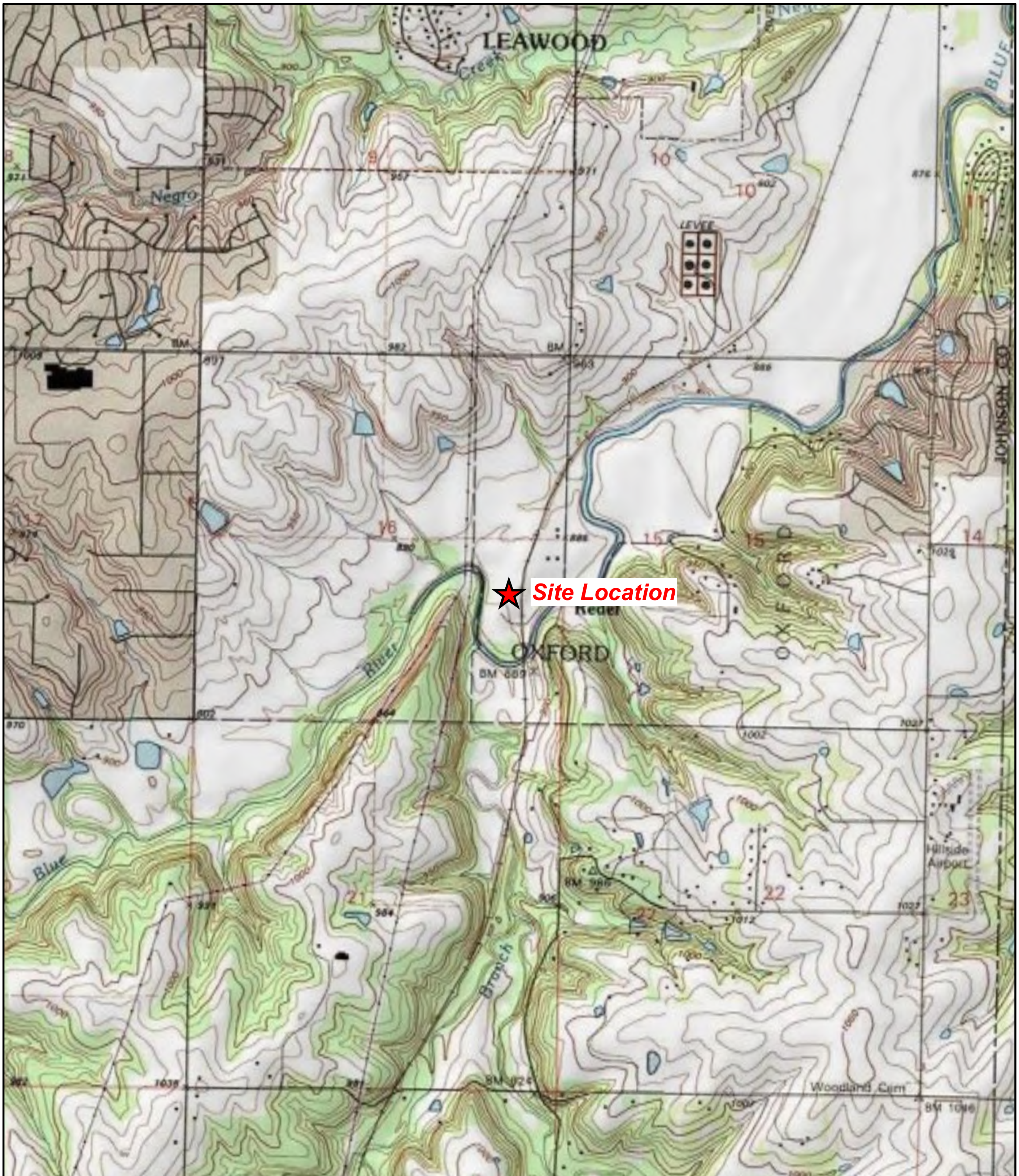
Seagull Environmental Technologies, Inc. (Seagull). 2012. Phase II Targeted Brownfields Assessment, Kuhlman Diecasting site, Stanley, Kansas. September 28.

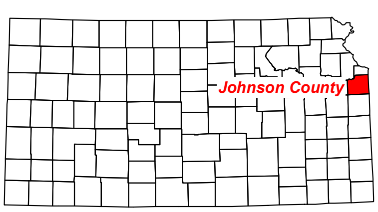
Tetra Tech Inc (Tetra Tech). 2013. Phase II Targeted Brownfields Assessment, Kuhlman Diecasting site. Stanley, Kansas. August 19.

U.S. Geological Survey (USGS). 1991. Stillwell, Kansas, Quadrangle, 7.5-minute Topographic Series.

APPENDIX A

FIGURES





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Feet

Source: USGS Belton, Kansas 7.5 Minute Topo Quad, 1991
USGS Stilwell, Kansas 7.5 Minute Topo Quad, 1991

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Kuhlman Diecasting Site
16400 Mission Road
Stanley, Kansas

Figure 1
Site Location Map

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Legend

Missouri Pacific Railroad	Approximate site boundary
Major road	Water body
Street	Surface impoundment (capped)
	Water evaporation sanitary lagoon

Source: ArcGIS Online, World Imagery, 2012; HSIP Gold, 2007

Kuhlman Diecasting Site
16400 Mission Road
Stanley, Kansas

Figure 2
Site Layout Map

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Date: 09/11/13 Drawn By: Nick Wiederholt Project No: X9004.L.06.0002.015.024

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