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Limited Phase II Environmental Site Assessment

Warren Performance Packaging

Draft Report

Council Bluffs, Iowa

Prepared for:

Warren Distribution

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Executive Summary

HDR Engineering, Inc. (HDR) conducted a Limited Phase II Environmental Site Assessment (Phase II ESA) at the Warren Performance Packaging Plant in Council Bluffs, Iowa (Site). Warren Distribution (Warren) is considering the construction of a warehouse at this Site.

The objective of this Limited Phase II ESA was to investigate the environmental conditions identified in the August 29, 2011 Phase I ESA for Warren Performance Packaging completed by AEI Consultants. In addition, an environmental investigation was completed in the vicinity of the flammable tank farm and the north tank farm, pursuant to the November 17, 2011 email from US Bank. This ESA was conducted in general conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Practice E 1903-11.

Phase II ESA activities included the advancement of nine (9) direct push borings. Several locations within the property boundary, including the tank farm area, railroad spur, flammable tank farm, and outfall areas, were investigated. Laboratory analyses were completed for soil and groundwater samples. The results of the Phase II ESA activities were used to evaluate whether or not soils and/or groundwater have been contaminated above established action levels resulting from historic activities at the Site

Findings and Conclusions

The analytical results indicated detections of toluene, zinc, diesel and motor range organics, ethylene glycol and methanol in the Site soils and detections of carbon disulfide, MTBE, diesel and gasoline range organics, zinc and ethylene glycol in groundwater.

The analytical results indicate Site soils may be impacted by historical activities due to the detection of diesel and motor oil range organics in the vicinity of the tank farms and detection of methanol in the vicinity of the railroad track unloading area; however, no compounds of interest were detected in soil at concentrations above the Iowa DNR Statewide Standards.

Site assessment activities did identify environmental impact in groundwater. The groundwater is impacted by diesel range organics. The impacted area is isolated to the western portion of the Site north of the south tank farm. The level of petroleum contamination found was similar in level and areas as documented in the 2003 Phase II ESA. The results indicate that petroleum contamination may be migrating west, toward the Missouri River, along preferential pathways. The soils in the western portion of the site, where the elevated diesel range organic was identified is characterized as mainly lean clay, with fine grained sand seams interspersed. The sand seams could provide a conduit for either onsite contamination to infiltrate the groundwater table or provide a preferential pathway for offsite contaminates.

Although diesel range organics were detected above groundwater standards, the area is supplied by a public water supply system and the only potential receptor is the Missouri River. The Missouri River is unlikely to be affected by the low levels of petroleum contamination identified.

1.0 Introduction

HDR Engineering, Inc. (HDR) conducted a Limited Phase II Environmental Site Assessment (Phase II ESA) at the Warren Performance Packaging Plant in Council Bluffs, Iowa (Site). Warren Distribution (Warren) is considering the construction of a warehouse at this Site. This ESA was conducted in general conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Practice E 1903-11.

1.1 Purpose and Involved Parties

The purpose of this Limited Phase II ESA was to evaluate the Recognized Environmental Conditions (RECs) identified in the August 29, 2011 Phase I ESA for Warren Performance Packaging completed by AEI Consultants.

A REC is defined by ASTM Practice E 1527-05 as: "The presence or likely presence of any hazardous substances or petroleum products on a project site under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the project site or into the ground, groundwater, or surface water of the project site. The term includes hazardous substances or petroleum products even under conditions of storage and use in compliance with local and state laws and regulations. The term is not intended to include *de minimus* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of regulatory governmental agencies. Conditions determined to be *de minimus* are not recognized environmental conditions."

In addition, an environmental investigation was completed in the vicinity of the flammable tank farm and the north tank farm, pursuant to the November 17, 2011 email from US Bank.

This Limited Phase II ESA report has been prepared for Warren, and only Warren has the right to rely on the contents of this report.

1.2 Scope of Services, Significant Assumptions, and Limitations

The Limited Phase II ESA was conducted in accordance with the HDR prepared Work Plan entitled, "Phase II Investigation, Warren Performance Packaging," dated December 2011 (Work Plan). The services performed for this project consisted of the following:

- Review of previous site assessments
- Conduct field explorations
- Provide a general description of the topography, soils, and geology.
- Collect and submit soil and groundwater samples for laboratory analysis.
- Evaluate analytical results
- Prepare a written report of methods, findings, and conclusions

The goal of this scope of services is to assist Warren in satisfying the appropriate inquiry element of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA's) innocent purchaser defense, as defined in 42 United States Code [U.S.C.] § 960, where a previous assessment satisfying that element identified recognized environmental conditions and in making informed business decisions about the Site based

on the nature and extent of contamination based on historical Site activities. HDR has made certain assumptions in preparing the scope of this assessment:

- Site operations reflect site conditions relative to potential releases and no intentional concealment of environmental conditions or releases has occurred.
- Published geologic information and site observations made by the environmental professional are used to estimate likely contaminant migration pathways in the subsurface. These estimates by the environmental professional are limited in accuracy and are generally cross-referenced with existing information about similar sites and environmental releases in the area.
- Regulatory information is limited to sites discovered after the late 1980s because reliable records were not kept by regulatory agencies prior to that time frame.

Measurements and sampling data only represent the Site conditions at the time of data collection. Therefore, the usability of data collected as part of this Limited Phase II ESA may have a finite lifetime depending on the application and use of the data. An environmental professional should evaluate whether the generated data are appropriate for any subsequent use beyond the original purpose for which it was collected.

2.0 Background

2.1 Site Description and Features

The Site is located on the west side of River Road in a mixed commercial and indust5rial area of Council Bluffs, Iowa in Sections 4 and 9, Township 74 North, Range 44 West, in Pottawattamie County, Iowa (Figure 1). The latitude and longitude are 41.23369 and -95.908019.

2.2 Area Geology and Hydrogeology

The United States Geological Survey (USGS) quadrangle map indicates that the Site is approximately 990 feet above mean sea level. The topography of the Site is flat with a slight gradient toward the west (see Figure 1). According to the USGS the area surrounding the subject property is underlain by alluvial deposits of Pennsylvanian-era.

According to the Pottawattamie County NRCS-USDA Soil Survey, the soil series mapped at the site is Sarpy loamy fine sand. The Sarpy series consists of moderately deep, excessively drained soils formed in sandy alluvium. These soils are formed on flood plains.

Groundwater in the Site area is anticipated to flow toward the west along the topographic gradient towards the Missouri River.

2.3 Site History and Land Use

The Site is currently operated by Warren Performance Packaging. Warren Performance Packaging is a manufacturing facility, which blends lubricating oils and chemicals for automotive applications and makes plastic bottles. The Site totals approximately 11.26 acres and is improved with three single-story buildings totaling approximately 287,076 square feet.

According to AEI's Phase I ESA, the Site buildings were constructed in phases from 1971 to 2010. Prior to construction of the buildings, the property was undeveloped wooded land.

2.4 Site and Vicinity Characteristics

The property is located in a mixed commercial and industrial area of Council Bluffs. Land uses and facilities near the Site include:

- Warren Distribution Center – east
- Missouri River – west
- I-80 Sewage Pump Station and Interstate I-80 – south
- Cargill AG Horizons - north

2.5 Summary of Previous Assessments

Phase I and II ESAs were completed by Terracon in 2003. Phase II activities included the advancement of nine soil borings in locations most likely to be impacted by petroleum compounds. The Phase II ESA indicated elevated soil and groundwater concentrations of total extractable hydrocarbons (TEH).

Environmental screening was conducted by Thiele Geotech, Inc in 2008 to assess the potential for contamination associated with identification of two small holes on the floor of an existing aboveground storage tank (AST). Sampling results indicated that soil samples were below the Iowa Risk-Based Corrective Action (RBCA) Tier 1 Action Levels. Groundwater samples exceeded the levels for TEH and diesel.

Finally, a Phase I ESA was completed by AEI Consultants in 2011, which identified environmental conditions present at the Site. The Phase I ESA identified two RECs:

- REC 1 – "Known soil and groundwater contamination documented in the 2003 Phase II ESA constitute a REC". The Phase I reviewer recommends additional investigation to further define the extent of environmental impacts.
- REC 2 – "Leaks and spills have occurred in the railroad truck unloading area and the western outfall since the Phase II investigation was performed in 2003."

Refer to Phase I ESA for further details regarding previous site assessments.

Review of the previous site assessments by US Bank indicated that two areas, the flammable tank farm and the north tank farm, had not been investigated to date. Additional sampling locations were requested by US Bank in an email dated November 17, 2011 to assess potential environmental impacts in these areas.

3.0 Phase II Activities

3.1 Scope of Assessment

Phase II ESA sampling activities were designed to identify whether soils and/or groundwater are contaminated above action levels resulting from historic activities at the Site in the vicinity of the RECs and the US Bank identified locations. The scope of the Phase II activities involved sampling at several locations within the Site boundary as described below:

- Areas of known soil and groundwater contamination (REC 1)
- Railroad Unloading Area (REC 2)
- Outfall Areas (REC 2)
- Tank Farm Area (US Bank identified location)
- Flammable Tank Farm (US Bank identified location)

3.1.1 Supplemental Record Review

No supplemental records were reviewed prior to the Phase II ESA.

3.1.2 Conceptual Site Model and Work Plan

The conceptual site model takes into consideration the potential distributions of contaminants with respect to the properties, behaviors and fate and transport characteristics of the contaminant in a setting such as that being assessed. The Work Plan was designed to provide for the collection of potentially contaminated environmental media, if they occur, at locations and depths where the highest concentrations are likely to occur.

3.1.3 Contaminants of Concern

Contaminants of concern (COC) were selected for this Limited Phase II ESA based on review of historical land uses at the Site and previous environmental assessments. The Work Plan was designed to determine if fuels and volatile compounds associated with fuels, as well as analytes associated with antifreeze or other non-typical auto fluids have impacted the surrounding soil and groundwater at levels that exceed regulatory standards. The following COCs were analyzed:

- Volatile Organic Compounds (VOCs)
- Total Petroleum Hydrocarbons (OA-2)
- Glycols
- Methanol
- Zinc

3.1.4 Deviations from Work Plan

Deviations from the Work Plan (December, 2011) include:

- Boring B-10 was drilled to 32 feet in an attempt to collect groundwater. No groundwater entered the direct push boring due to the tight clays encountered during drilling.

3.2 Field Explorations and Methods

3.2.1 Soil Borings

Field activities for the Phase II ESA were completed on December 15, 2011. A total of nine (9) direct-push borings were advanced at several locations within the Site boundary as described below:

- Soil borings B-11, B-12, B-13, B-17 and SS-1 were advanced in areas of known soil and groundwater contamination to further define the extent of environmental impacts.
- Soil boring B-16 was advanced in the Railroad Unloading Area to determine if reported leaks and or spills that occurred in the railroad track unloading area resulted in environmental impacts.
- Soil boring B-10 was advanced to assess potential environmental impacts associated with ASTs in the North Tank Farm
- Soil borings B-14 and B-15 were advanced to assess potential environmental impacts associated with ASTS located in the Flammable Tank Farm.

Samples were collected from the depth with the highest PID reading or at a depth where soils appeared to be native or at groundwater.

For each boring, a Geoprobe® direct-push or similar methodology was used to obtain the samples. The following procedures and equipment were used to advance and sample the borings.

- **Push and sample borings:** The sample process involved use of a direct push sampler, with recovery of a 4-foot core. Remove liner from direct push sampler. A photoionization detector (PID) was used to scan the core samples for VOCs.
- **Collect representative sample of the subsurface material for laboratory analyses:** One sample was collected from each boring location. The sample with the highest PID reading was submitted for laboratory analyses. If there were no PID detections, a sample was collected from either the unsaturated location just above the groundwater interface (smear zone) or native soil and submitted for laboratory analyses.
- **Collect representative sample of groundwater for laboratory analyses:** A groundwater sample was collected from each boring location when available using direct push technology. A 4-foot long stainless steel barrel, which contains a drive tip and an integral internal stainless steel mesh screen was used to collect the groundwater samples.
- **Abandon borings:** After completion of the drilling and sampling activities the boreholes were backfilled with bentonite pellets.

3.2.1 Soil Sampling Location SS-2

At soil sampling location SS-2, surface (0-1') and near surface (1'-2') soil samples were collected near the "western outfall", between the outfall and edge of Missouri River. Soil samples were screened visually and with a PID. No evidence of petroleum contamination was detected. As a result, no samples collected from this location were submitted for laboratory analysis.

3.3 Sampling and Chemical Analyses and Methods

Soil and groundwater samples were submitted under chain-of-custody (COC) to Test America in Cedar Falls, Iowa. Environmental Protection Agency (EPA) procedures were used during the laboratory testing.

3.3.1 Soil

Soil samples were analyzed for the following analytes:

- VOCs by EPA Method 8260B
- TPH (OA-2) by EPA Method 8015B
- Zinc by EPA Method 6010B
- Methanol by EPA Method 8015
- Glycols by EPA Method 8015m
- Percent Solids by EPA Method 2540G

3.3.2 Groundwater

Groundwater samples were analyzed for the following analytes:

- VOCs by EPA Method 8260B
- TPH (OA-2) by EPA Method 8015B
- Zinc by EPA Method 6010B
- Methanol by EPA Method 8015
- Glycols by EPA Method 8015m

4.0 Evaluation and Presentation of Results

4.1 Subsurface Conditions

4.1.1 Geologic Setting

The area geology is provided in Section 2.2. Additional information may be found in the 2011 AEI Consultant report.

The Site lithology consists of colluvium overlaying alluvium, generally overlain by fill. The fill material encountered on-site consisted of either fine-grained sand or lean clay and ranged in thickness from two to four feet. Immediately underlying the fill material, colluvium was encountered. Colluvium consisted of various shades of brown and grey, lean clay, occasionally silty or sandy to depths of approximately 6 to 8 feet bgs. Alluvium was encountered underneath the colluvium in the eastern and southern portions of the Site. The alluvium consisted of varying shades of brown, well-sorted, fine-grained sand. The extent of alluvium decreased to the west and north, with only small lenses identified within soil column. Groundwater was identified at a depth of approximately 11 feet bgs.

4.1.2 Hydrogeologic Conditions

Groundwater elevation data was obtained from the open boreholes, but an estimate of the groundwater contour could not be determined. A relatively long period of time is necessary, especially with the presence of clay lenses, for a groundwater level to develop and stabilize in a borehole. Longer term monitoring in cased holes or piezometers would be required for a more accurate evaluation of the groundwater conditions.

Based on observations during drilling, the water level at the Site was approximately eleven (11) feet bgs. The groundwater level is likely subject to seasonal fluctuations of the Missouri River level.

Groundwater was not encountered in one of the soil borings (B10). The boring was advanced to a depth of 32 feet, but no groundwater entered the direct push boring due to the tight clays encountered during drilling.

4.1.3 Verification of Conceptual Site Model

The conceptual site model and work plan developed for the Site were verified during the Limited Phase II ESA activities.

The QA/QC procedures described in the Work Plan were adequate to verify the data acceptability.

4.2 Analytical Data

The VOC, zinc, methanol and glycol analytical results were compared to EPA Regional Screening Levels (RSLs) or Iowa Department of Natural Resources Statewide Standards. TPH analytical results were compared to risk-based screening levels (RBSLs) established in the IDNR environmental guidance document for petroleum hydrocarbon releases titled Tier 1 Guidance, Leaking Underground Storage Tanks, using Risk-Based Corrective Action (RBCA).

4.2.1 Soil

- Toluene was the only VOC detected in the soil samples. Toluene was detected at boring B-16.The results indicated that this detection was not greater than the applicable standards.
- Zinc was detected above the laboratory method detection at borings B-10, B-11, B-12, B-13, B-16, B-17 and SS-1. The analytical results indicated that all detections of zinc were at concentrations below the applicable standards.
- TPH (motor oil, gasoline, and diesel range organics) was detected at three boring locations. Diesel and motor oil range organics were detected at borings B-10 and B-11 and motor oil range organics were detected at boring B-12. The detections of diesel range organics were below the Iowa DNR Contaminant Corrective Action level. There is no defined action level for gasoline and motor oil range organics contaminated soils.
- Ethylene glycol was detected only at soil boring B-16. The analytical results indicated that the detection was at a concentration below the applicable standards.
- Methanol was detected at soil borings B-17, B-10 and SS-1. The analytical results indicated that all detections were at concentrations below the applicable standards.

A summary of the soil analytical results and comparison to applicable standards is provided in Tables 4-1 through 4-4, which is included at the end of this report behind the tables tab. The analytical reports are included as Appendix A.

4.2.2 Groundwater

- Only two VOCs were detected in the groundwater samples collected from the borings. Carbon disulfide was identified in groundwater from boring B-13 and methyl tert-Butyl Ether in groundwater from boring B-11. The analytical results indicated that detections of carbon disulfide and methyl tert-Butly Ether were at concentrations less than applicable standards.
- Zinc was detected above the laboratory method detection limit in groundwater samples collected from boring locations B-11, B-12, B-13, B-16 and B-17. The analytical results indicated that all detections of zinc were at concentrations below the applicable standards.
- TPH (gasoline or diesel range organics) was detected in groundwater samples collected at two soil boring locations (B-11 and B-13). Diesel and gasoline range organics were detected at boring B-11 and diesel range organics were detected at B-13. The diesel range organics concentration detected at boring B-11was 4,050 µg/l, which exceeds the Iowa DNR Corrective Action Level of 1,200 µg/L. The concentration of diesel range organics at B-13 was below the applicable level. There is not a defined action level for gasoline range for groundwater.
- Ethylene glycol was detected only in the groundwater sample collected from soil boring B-16. The analytical results indicated that the detection was at a concentration below the applicable standards.
- Methanol was not detected in any groundwater samples.

A summary of the groundwater analytical results and comparison to applicable standards is provided in Table 4-5 through 4-8, which is included at the end of this report behind the tables tab. The analytical reports are included as Appendix A.

5.0 Discussion of Findings and Conclusions

5.1 Recognized Environmental Conditions

Based on the Phase I ESA, the conceptual site model was designed to provide for the collection of potentially contaminated environmental media in the areas of the RECs and the US Bank identified locations as follows:

- Areas of known soil and groundwater contamination (REC 1)
- Railroad Unloading Area (REC 2)
- Outfall Areas (REC 2)
- Tank Farm Area (US Bank identified location)
- Flammable Tank Farm (US Bank identified location)

Compounds of interest were VOCs, TPH, zinc and alcohols.

5.2 Affected Media

The analytical results indicated detections of toluene, zinc, diesel and motor range organics, ethylene glycol and methanol in the Site soils and detections of carbon disulfide, MTBE, diesel and gasoline range organics, zinc and ethylene glycol in groundwater.

The detection of the toluene and ethylene glycol was limited to one soil boring (B-16) located in the eastern portion of the Site, south of the railroad spur. Ethylene glycol was also detected in the groundwater sample collected from this boring. Detections of toluene and ethylene may be associated with documented spills and or leaks in the vicinity of the railroad track unloading area. The soil and groundwater detections were all below applicable standards.

Methanol was detected in soil samples collected from two borings (B-17 and SS-1), which are located along the railroad spur and at boring B-10, which is located west of the north tank farm. Detections of methanol may be associated with documented spills and or leaks in the vicinity of the railroad track unloading area. All detections of methanol were at levels below applicable standards. Methanol was not detected in any groundwater samples.

Zinc was detected in both soil and groundwater samples across the majority of the Site. Zinc concentrations in the soil ranged from 22.0 mg/kg to 70.4 mg/kg, with a mean concentration of 50 mg/kg. Review of technical papers indicated that the background concentration for zinc in soils is approximately 60 mg/kg. During groundwater sampling activities the boreholes were purged in an attempt to reduce the turbidity of the sample, but the foot-valve sampling method tends to agitate the water column somewhat and slightly increase the turbidity of the sample. In addition, the groundwater samples were not filtered, so naturally occurring zinc (i.e., suspended solids, colloids, etc.) were not excluded from the sample. Sediments containing naturally occurring zinc could bias the groundwater results above their ambient levels. The average zinc concentration in the Site soils is less than the background concentration and all detections of zinc in soil and groundwater were below applicable standards.

TPH (OA-2) was detected in soil samples collected from three soils borings (B-10, B-11 and B-12) located in the western portion of the Site adjacent to the north and south tank farms. Diesel and motor oil range organics were detected at boring B-10 and B-11 and motor oil range organics were detected at boring B-12. Diesel and gasoline range organics were

detected at boring B-11 and diesel range organics at B-13. Gasoline range organics were not detected in any of the soil samples collected. The concentration of diesel range organics (4,050 µg/L) in the groundwater sample collected from B-11 exceeds the Iowa DNR Contaminate Corrective Action Level of 1,200 µg/L.

5.3 Evaluation of Media Quality

Duplicate soil and groundwater samples were collected and analyzed to determine variability in the sampling procedure, and to provide a quality assurance check on total measurement precision of the analytical laboratory and field sampling procedures. Field duplicates were collected independently from the characteristic sample, i.e., bailer volumes were not shared between the duplicate and its characteristic sample.

Duplicate samples were generated at a frequency of one to every ten samples. A total of 9 soil samples were collected and 1 duplicate soil samples was collected. A total of 7 characteristic groundwater samples were collected and 1 duplicate groundwater samples was collected.

The concentrations in the duplicate samples did not vary by more than an order of magnitude and relative percent differences were within 20%. HDR reviewed the laboratory qualifiers in the report, and determined that the laboratory's data quality was sufficient for this project.

5.4 Site Considerations

The analytical results indicate Site soils may be impacted by historical activities due to the detection of diesel and motor oil range organics in the vicinity of the tank farms and detection of methanol in the vicinity of the railroad track unloading area; however, no compounds of interest were detected in soil at concentrations above the Iowa DNR Statewide Standards.

Site assessment activities did identify environmental impact in groundwater. The groundwater is impacted by diesel range organics. The impacted area is isolated to the western portion of the Site north of the south tank farms. The level of petroleum contamination found was similar in level and areas as documented in the 2003 Phase II ESA. The new borings were placed downgradient of the historical borings to investigate the extent of soil and groundwater impacted. The results indicate that petroleum contamination may be migrating west, toward the Missouri River, along preferential pathways. The soils in the western portion of the site, where the elevated diesel range organic was identified is characterized as mainly lean clay, with fine grained sand seams interspersed. The sand seams could provide a conduit for either onsite contamination to infiltrate the groundwater table or provide a preferential pathway for offsite contaminates.

5.5 Conclusions

The analytical results indicate that the soil and groundwater at the Site may be impacted by historical activities or been subject to upgradient, off-site contamination. The only compound of interest detected at concentrations above the Iowa DNR Statewide Standard Values was diesel range organics. Diesel range organics was found at a concentration greater than the applicable groundwater standards at soil boring location B-11. Although diesel range organics were detected above groundwater standards, the area is supplied by a public water supply system and the only potential receptor is the Missouri River. The Missouri River is unlikely to be affected by the low levels of petroleum contamination identified.

Tables

6.0 References

ASTM Practice E 1527-05. 2005. Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.

HDR Engineering, Inc. 2011. Phase II Investigation, Work Plan, Warren Performance Packaging, December, 2011.

United States Department of Agriculture Soil Conservation Service. *Soil Survey of Pottawattamie County, Iowa.* 1989.

Table 4-1
Summary of VOC's Analytical Results - Soil

Location	Sample Identification	Date Sampled	VOCs (Method 8260B)
			Toluene
Iowa DNR Statewide Standard Value (µg/kg)			*6.1E+06*
Regional Screening Value (µg/kg)			*4.5E+04*
B-10	WD-S0-B10-4-6	12/15/2011	<332
B-11	WD-S0-B11-6-8	12/15/2011	<529
B-12	WD-S0-B12-2-4	12/15/2011	<470
B-13	WD-S0-B13-4-6	12/15/2011	<544
B-14	WD-S0-B14-4-6	12/15/2011	<301
	WD-S0-B140-4-6	12/15/2011	<563
B-15	WD-S0-B15-10-12	12/15/2011	<2.47
B-16	WD-S0-B16-6-8	12/15/2011	**6.36**
B-17	WD-S0-B17-8-10	12/15/2011	<184
SS-1	WD-S0-SS1-4-6	12/15/2011	<697

Notes:
1. All results in µg/kg.
2. Analytical results were compared to Iowa Department of Natural Resources State Wide Standard Values and EPA Regional Screening levels for industrial soil
3. **Bold** indicates the concentration was greater than the detection limit.

Table 4-2
Summary of Zinc Analytical Results - Soil

Location	Sample Identification	Date Sampled	(Method 6010B) Zinc
Iowa DNR Statewide Standard Value (mg/kg)			*2.3E+04*
Regional Screening Value (mg/kg)			*3.1E+05*
B-10	WD-SO-B10-4-6	12/15/2011	**43.6**
B-11	WD-SO-B11-6-8	12/15/2011	**62.1**
B-12	WD-SO-B12-2-4	12/15/2011	**45.1**
B-13	WD-SO-B13-4-6	12/15/2011	**70.3**
B-14	WD-SO-B14-4-6	12/15/2011	-
	WD-S0-B140-4-6	12/15/2011	-
B-15	WD-SO-B15-10-12	12/15/2011	-
B-16	WD-SO-B16-6-8	12/15/2011	**36.4**
B-17	WD-SO-B17-8-10	12/15/2011	**22.0**
SS-1	WD-SO-SS1-4-6	12/15/2011	**70.4**

Notes:

1. All results in mg/kg.
2. Analytical results were compared to Iowa Department of Natural Resources State Wide Standard Values and EPA Regional Screening levels for industrial soil
3. **Bold** indicates the concentration was greater than the detection limit.
4. "-" indicates that the sample was not analyzed for the analyte

Table 4-3
Summary of TPH Analytical Results - Soil

Location	Sample Identification	Date Sampled	Total Petroleum Hydrocarbons (OA-2) (Method 8015B)			
			Total Extractable Hydrocarbons	Diesel	Gasoline	Motor
Iowa DNR Tier 1 RBCA (mg/kg)			*NA*	*3800*	*NA*	*NA*
B-10	WD-SO-B10-4-6	12/15/2011	**109**	**22.0 Q**	<7.88	**87.3**
B-11	WD-SO-B11-6-8	12/15/2011	**41.6**	**32.0 Q**	<7.84	**9.53 Q**
B-12	WD-SO-B12-2-4	12/15/2011	**21.5**	<7.81	<7.81	**21.5**
B-13	WD-SO-B13-4-6	12/15/2011	<11.9	<11.9	<11.9	<11.9
B-14	WD-SO-B14-4-6	12/15/2011	<7.77	<7.77	<7.77	<7.77
	WD-S0-B140-4-6	12/15/2011	<11.7	<11.7	<11.7	<11.7
B-15	WD-SO-B15-10-12	12/15/2011	<11.6	<11.6	<11.6	<11.6
B-16	WD-SO-B16-6-8	12/15/2011	<11.8	<11.8	<11.8	<11.8
B-17	WD-SO-B17-8-10	12/15/2011	<11.8	<11.8	<11.8	<11.8
SS-1	WD-SO-SS1-4-6	12/15/2011	<11.7	<11.7	<11.7	<11.7

Notes:

1. Samples were analyzed for total petroleum hydrocarbons (TPH) gasoline range organics (GRO) (C6-C10), diesel range organics (DRO) (C10-C-28)and motor range organics (C24-C36) by United States Environmental Protection Method 8015B.
2. All units are reported in mg/kg.
3. Analytical results were compared to Risk-Based Screening Levels established in the Iowa Department of Natural Resources environmental guidance document for petroleum hydrocarbon releases entitled Tier 1 Guidance, Leaking Underground Storage Tank, Using Risk-Based Corrective Action (RBCA).
4. **Bold** indicates the concentration was greater than the detection limit.
5. Abbreviations
   Q indicates poor chromatographic match to standard
   NA indicates that no applicable standard has been developed for the analyte

Table 4-4
Summary of Alcohols/Glycols Analytical Results - Soil

Location	Sample Identification	Date Sampled	Alcohols/Glycols (Method 8015)	
			Ethylene Glycol	Methanol
Iowa DNR Statewide Standard Value (mg/kg)			*1.2E+05*	NA
Regional Screening Value (mg/kg)			*1.2E+06*	*3.10E+05*
B-10	WD-SO-B10-4-6	12/15/2011	<13.6	**40.8**
B-11	WD-SO-B11-6-8	12/15/2011	<12.9	<12.9
B-12	WD-SO-B12-2-4	12/15/2011	<11.3	<11.3
B-13	WD-SO-B13-4-6	12/15/2011	<13.5	<13.5
B-14	WD-SO-B14-4-6	12/15/2011	-	<12.5
	WD-S0-B140-4-6	12/15/2011	-	<12.8
B-15	WD-SO-B15-10-12	12/15/2011	-	<12.6
B-16	WD-SO-B16-6-8	12/15/2011	**16.8**	<12.4
B-17	WD-SO-B17-8-10	12/15/2011	<12.4	**22.3**
SS-1	WD-SO-SS1-4-6	12/15/2011	<13.9	**24.4**

Notes:

1. Samples were analyzed for glycols by United States Environmental Protection Method 8015 and Methanol by USEPA Method 8015m
2. All units are reported in mg/kg.
3. Analytical results were compared to Iowa Department of Natural Resources State Wide Standard Values and EPA Regional Screening levels for industrial soil
4. **Bold** indicates the concentration was greater than the detection limit.
5. NA indicates that no applicable standard has been developed for the analyte.

Table 4-5
Summary of VOC's Analytical Results - Groundwater

Location	Sample Identification	Date Sampled	VOCs (Method 8260B)	
			Carbon Disulfide	Methyl tert-Butyl Ether
Iowa DNR Statewide Standard Value (µg/L)			*3500*	*1000*
Regional Screening Value (µg/L)			*1000*	*12*
B-10	WD-GW-B10	12/15/2011	<1.00	<1.00
B-11	WD-GW-B11	12/15/2011	<1.00	**3.70**
B-12	WD-GW-B12	12/15/2011	<1.00	<1.00
B-13	WD-GW-B13	12/15/2011	**3.73**	<1.00
B-14	WD-GW-B14	12/15/2011	<1.00	<1.00
	WD-GW-B140	12/15/2011	<1.00	<1.00
B-15	WD-GW-B15	12/15/2011	<1.00	<1.00
B-16	WD-GW-B16	12/15/2011	<1.00	<1.00
B-17	WD-GW-B17	12/15/2011	<1.00	<1.00
SS-1	WD-GW-SS1	12/15/2011	<1.00	<1.00

Notes:

1. All results in µg/L.
2. Analytical results were compared to Iowa Department of Natural Resources State Wide Standard Values and EPA Regional Screening levels
3. **Bold** indicates the concentration was greater than the detection limit.

Table 4-6
Summary of Zinc Analytical Results - Groundwater

Location	Sample Identification	Date Sampled	(Method 6010B) Zinc
Iowa DNR Statewide Standard Value (mg/L)			*10*
Regional Screening Value (mg/L)			*5*
B-10	WD-GW-B10	12/15/2011	-
B-11	WD-GW-B11	12/15/2011	**2.15**
B-12	WD-GW-B12	12/15/2011	**0.549**
B-13	WD-GW-B13	12/15/2011	**0.291**
B-14	WD-GW-B14	12/15/2011	-
	WD-GW-B140	12/15/2011	-
B-15	WD-GW-B15	12/15/2011	-
B-16	WD-GW-B16	12/15/2011	**0.185**
B-17	WD-GW-B17	12/15/2011	**0.195**
SS-1	WD-GW-SS1	12/15/2011	-

Notes:

1. All results in mg/L.
2. Analytical results were compared to Iowa Department of Natural Resources State Wide Standard Values and EPA Regional Screening levels
3. **Bold** indicates the concentration was greater than the detection limit.
4. "-" indicates that the sample was not analyzed for the analyte.

Table 4-7
Summary of TPH Analytical Results - Groundwater

Location	Sample Identification	Date Sampled	Total Petroleum Hydrocarbons (OA-2) (Method 8015B)			
			Total Extractable Hydrocarbons	Diesel	Gasoline	Motor
Iowa DNR Tier 1 RBCA (µg/L)			*NA*	*1200*	*NA*	*400*
B-10	WD-GW-B10	12/15/2011	-	-	-	-
B-11	WD-GW-B11	12/15/2011	**5330**	**4050 Q**	**1270 Q**	<300
B-12	WD-GW-B12	12/15/2011	<333	<333	<333	<333
B-13	WD-GW-B13	12/15/2011	**939**	**939 Q**	<333	<333
B-14	WD-GW-B14	12/15/2011	<423	<423	<423	<423
	WD-GW-B140	12/15/2011	<405	<405	<405	<405
B-15	WD-GW-B15	12/15/2011	<333	<333	<333	<333
B-16	WD-GW-B16	12/15/2011	<357	<357	<357	<357
B-17	WD-GW-B17	12/15/2011	<370	<370	<370	<370
SS-1	WD-GW-SS1	12/15/2011	-	-	-	-

Notes:

1. Samples were analyzed for total petrolum hydrocarbons (TPH) gasoline range organics (GRO) (C6-C10), diesel range organics (DRO) (C10-C-28)and motor range organics (C24-C36) by United States Environmental Protection Method 8015B.
2. All units are reported in µg/L.
3. Analytical results were compared to Risk-Based Screening Levels established in the Iowa Department of Natural Resources environmental guidance document for petroleum hydrocarbon releases entitled Tier 1 Guidance, Leaking Underground Storage Tank, Using Risk-Based Corrective Action (RBCA).
4. **Bold** indicates the concentration was greater than the detection limit.
5. Shaded indicates that the concentration exceeded the applicable standard.
6. Abbreviations
   NA indicates that no applicable standard has been developed for the analayte
   Q indicates poor chromatographic match to standard

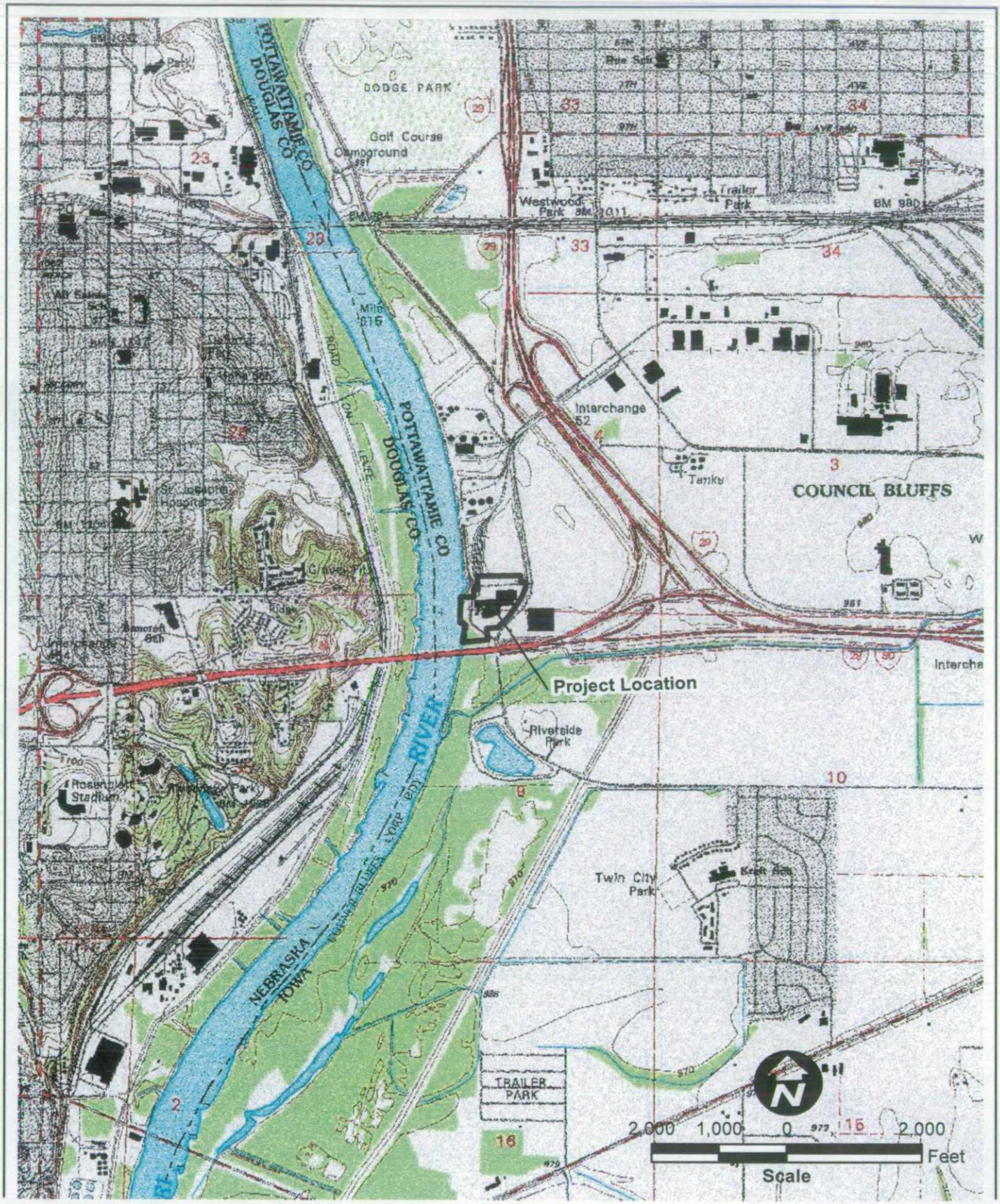
Table 4-8
Summary of Alcohols/Glycols Analytical Results - Groundwater

Location	Sample Identification	Date Sampled	Alcohols/Glycols (Method 8015/8015m)	
			Ethylene Glycol	Methanol
Iowa DNR Statewide Standard Value (mg/L)			*70*	*NA*
Regional Screening Value (mg/L)			*31*	*8*
B-10	WD-GW-B10	12/15/2011	-	-
B-11	WD-GW-B11	12/15/2011	<10.0	<10.0
B-12	WD-GW-B12	12/15/2011	<10.0	<10.0
B-13	WD-GW-B13	12/15/2011	<10.0	<10.0
B-14	WD-GW-B14	12/15/2011	-	<10.0
	WD-GW-B140	12/15/2011	-	<10.0
B-15	WD-GW-B15	12/15/2011	-	<10.0
B-16	WD-GW-B16	12/15/2011	**13.9**	
B-17	WD-GW-B17	12/15/2011	<10.0	<10.0
SS-1	WD-GW-SS1	12/15/2011	-	-

Notes:

1. Samples were analyzed for glycols by United States Environmental Protection Method 8015m and Methanol by USEPA Method 8015.
2. All units are reported in mg/L.
3. **Bold** indicates the concentration was greater than the detection limit.

Figures



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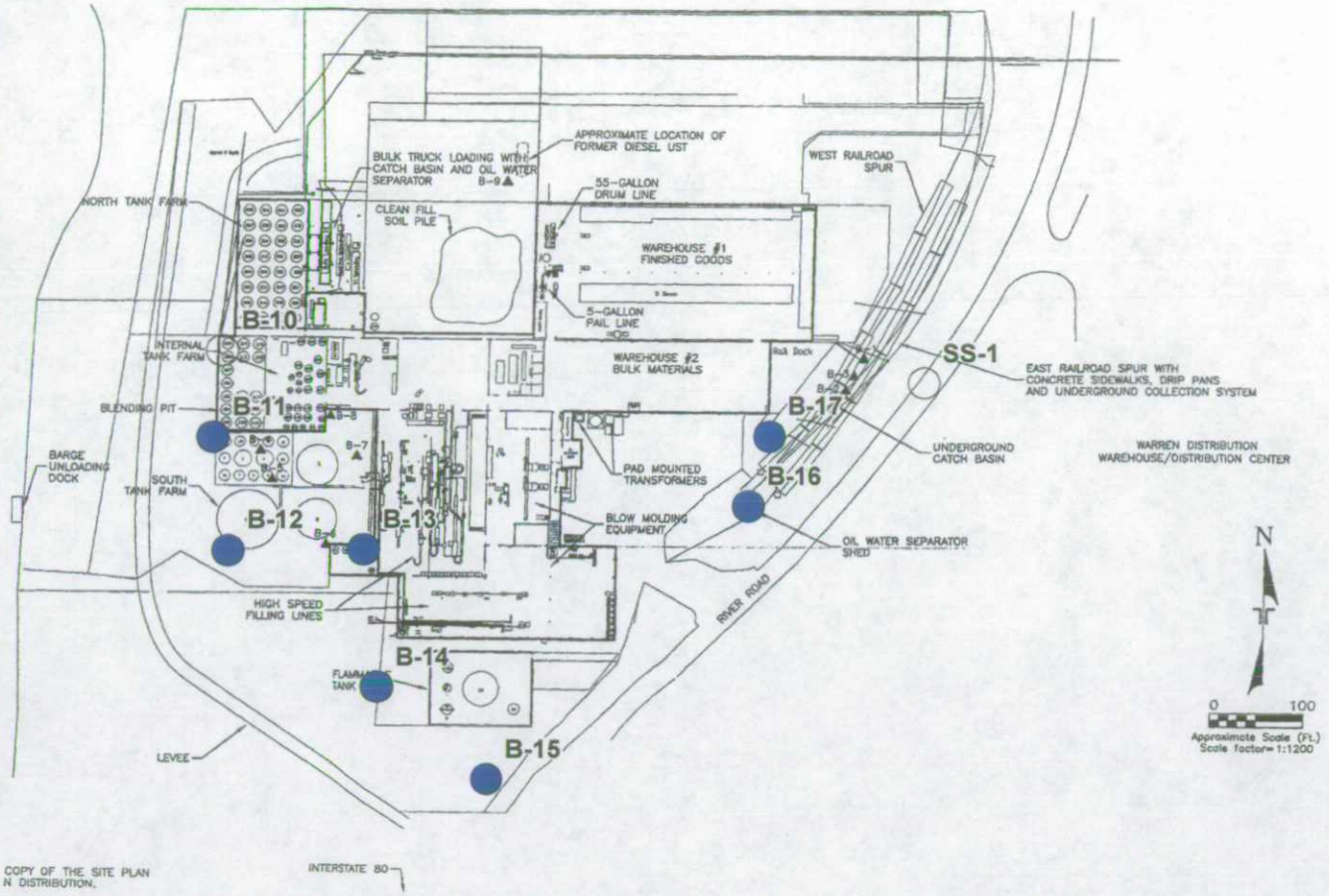
Site Map

Phase II Investigation
Warren Performance Packaging

DATE
January 2012

FIGURE
1



Legend

- Soil/GW Sampling Location
- Soil Sampling Location

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Sampling Location Map

Phase II Investigation
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FIGURE
2