
WEAVER

BOOS

CONSULTANTS

March 4, 2010
Project Number 0058-375-01

Ms. Ann Kolata
City of South Bend
Department of Community and Economic Development
227 W. Jefferson Blvd.
South Bend, IN 46601

**Re: Soil Characterization of Former Studebaker Foundry Reservoir
Northeast Corner of Prairie Avenue and Cotter Street
South Bend, Indiana**

Dear Ms. Kolata:

Weaver Boos Consultants, LLC (Weaver Boos) has completed the soil characterization of the former Studebaker Foundry reservoir as outlined in our proposal dated January 21, 2010 (Proposal M100103). It is our understanding that the existing stormwater collection system located along Cotter Street will be redirected to the former Studebaker Foundry reservoir located at the northeast corner of the intersection of Cotter Street and Prairie Avenue. As part of the reconstruction project the existing reservoir will be enlarged and deepened by approximately six feet to accommodate the anticipated volume of stormwater. Based on cross sections provided to Weaver Boos there are indications that approximately 7,000 cubic yards of subsurface material will be removed.

Background

A limited environmental investigation of the reservoir completed by Hull and Associates, Inc. (Hull) indicated that the reservoir was dry and densely vegetated. Two outfalls possibly leading into the former foundry building were observed along the east wall of the reservoir. A small amount of surface debris was observed at the bottom of the reservoir by Hull and there are indications that additional material may be buried along the banks of the reservoir. Four soil samples collected by Hull from a depth of 0.0-2.0 feet along on the top of the eastern reservoir bank and at the bottom of the reservoir contained detectable concentrations of heavy metals and polynuclear aromatic hydrocarbons (PNAs). The lead and arsenic concentrations exceed current

Indiana Risk Integrated System of Closure (RISC) industrial default closure levels but not the Tier II nonresidential cleanup criteria listed in the 1996 VRP Guidance Document (see Table 1).

Project Objectives

The two objectives of this project were as follows:

1. Complete an exploratory subsurface study primarily along the bank of the reservoir to explore for buried debris that could be considered a potential contaminant source.
2. Further characterize the extent of heavy metal and PNA contamination in the surface and subsurface soils within the perimeter of the planned reservoir reconstruction to assess whether planned reuse and/or disposal of the spoil might be restricted or prohibited.

Scope of Work

Task 1 – Complete Exploratory Study

To access the site (due to dense vegetation) and complete the assessment, Weaver Boos subcontracted with a local excavating company to excavate test pits along the bank and within the floor of the existing reservoir to explore for any buried debris that could be considered a source of contamination. The field study commenced on February 4, 2010 and was completed in one day. Weaver Boos recorded observations (see Table 2 and photographs) and approximate locations of each test pit location on the attached figure (Figure 1 – Test Pit Location Map). A total of 35 test pits were excavated to a maximum depth of 5-7 feet.

Task 2 – Collect and Analyze Surface and Subsurface Soil Samples

Concurrently with Task 1, soil samples were collected from the surface (< 2.0 feet below the ground surface) and subsurface of the reservoir from pits or trenches dug using the excavator. The subsurface soil samples were collected from above the proposed bottom of the new retention basin. Weaver Boos collected six (6) surface and six (6) subsurface soil samples at locations shown on Figure 1 – Test Pit Location Map.

The soil samples were submitted to an analytical laboratory for analysis of the following parameters: lead, arsenic, and PNAs (including naphthalene). Based upon results of the analytical results, Weaver Boos requested a TCLP analysis of the sample with the highest arsenic and lead concentrations to assess whether the soil exhibits hazardous waste characteristics.

Results

The following materials were identified in several test pits.

- metal conduit, brick debris, wire, copper pipe, metal buckets, concrete debris, barrels, tires, glass, rubber materials, bottles, discarded empty drums and containers, sanitary refuse, plastic debris, fencing, buried topsoil, and demolition debris.

Most of the debris was encountered along the eastern bank of the reservoir where a considerable amount of material was disposed. However, smaller percentages of buried debris were also identified along the entire rim of the reservoir. The thickness of debris ranged from 2-7 feet from the ground surface. There were no indications of buried debris inside the reservoir at the basin bottom. Remnants of a street (former Catalpa Avenue) were also identified just to the east of the reservoir. There were no visual or olfactory indications of potential soil contamination associated with the debris. The debris identified could be acceptable for disposal at a nearby Subtitle D landfill disposal facility. Some of the debris also could be recyclable.

The results of the analytical testing are tabulated in Table 1. Similar to the results from the investigation completed by Hull and Associates, Inc. in 2001, elevated arsenic, lead, and PNAs were detected in most of the samples collected. However, the concentrations did not exceed the 1996 Tier II Nonresidential Cleanup Criteria. The arsenic, lead, and benzo(a)pyrene (a PNA) concentrations did exceed current Indiana RISC industrial default closure concentrations. To determine if the soil exhibited hazardous waste characteristics, the soil samples with the highest metal concentrations were reanalyzed using the toxicity leaching characteristic procedure (TCLP). The results indicated that the soil samples did not exhibit hazardous waste characteristics (see Table 1).

Recommendations

Weaver Boos recommends that the buried debris be disposed off-site at an acceptable disposal facility such as a Subtitle D landfill. A small percentage of the debris could be recyclable. Any potential bidder for the reconstruction project should anticipate buried debris along the entire rim of the existing reservoir.

Weaver Boos understands that the Project Site and the adjoining properties to the north and east have been enrolled into the Indiana Voluntary Remediation Program (VRP) using the July 1996

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Guidance Protocol. As a result, any soil with contaminant concentrations that do not exceed the 1996 Indiana Tier II nonresidential default closure standards could be reused on-site as backfill material. Based on the results of this study, the soil excavated as part of this stormwater reconstruction project (once the debris has been removed) can be stockpiled and reused on-site assuming the physical characteristics of the soil meet the requirements for suitable backfill or topsoil. Any proposed removal/disposal of the soil from this site or the adjoining sites associated with the VRP would be restricted and could require disposal at a licensed Subtitle D landfill.

We appreciate this opportunity to be of service and are looking forward to working with you on this project. If you should have any questions or comments concerning this study, please do not hesitate to contact our office.

Sincerely,

Weaver Boos Consultants, LLC


Edward B. Stefanek
Senior Project Manager

Attachments: Tables
Figure
Analytical Laboratory Report
Photographs

TABLES

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SOIL SAMPLE AN
FORMER STUDI
SOUTH

Sample I.D.:	HA-1	HA-2	HMW-1D	SB-5	TP-1	TP-1	TP-2	TP-2	
Depth (ft):	0-0.5	0-1.0	0-2.0	0-1.5	0-2.0	4.0-5.0	0-2.0	4.0-5.0	
Date Collected:	7/31/2001	7/31/2001	7/31/2001	8/8/2001	2/4/2010	2/4/2010	2/4/2010	2/4/2010	
Parameter	Units								
METALS									
Arsenic	mg/kg-dry	13.4	18	7.4	57.1	14	2.7	2	2
Lead	mg/kg-dry	599	449	68	122	480	3.2	11	3.3
TCLP Arsenic	mg/l								
TCLP Lead	mg/l					0.09			
PNAS									
Acenaphthene	mg/kg-dry	<RL	---	---	<RL	0.26	<RL	<RL	<RL
Acenaphthylene	mg/kg-dry	<RL	---	---	<RL	<RL	<RL	<RL	<RL
Anthracene	mg/kg-dry	<RL	---	---	<RL	0.58	<RL	<RL	<RL
Benzo[a]anthracene	mg/kg-dry	<RL	0.84	---	<RL	2.9	<RL	<RL	<RL
Benzo[a]pyrene	mg/kg-dry	<RL	0.75	0.28	<RL	2	<RL	<RL	<RL
Benzo[b]fluoranthene	mg/kg-dry	<RL	1.69	0.56	<RL	3.9	<RL	<RL	<RL
Benzo[k]fluoranthene	mg/kg-dry	<RL	0.36	---	<RL	0.78	<RL	<RL	<RL
Benzo(g,h,i) perylene	mg/kg-dry	---	---	---	---	1.6	<RL	<RL	<RL
Chrysene	mg/kg-dry	<RL	1.58	---	<RL	3.2	<RL	<RL	<RL
Dibenz[a,h]anthracene	mg/kg-dry	<RL	---	---	<RL	0.31	<RL	<RL	<RL
Fluoranthene	mg/kg-dry	<RL	0.64	0.59	<RL	6.4	<RL	<RL	<RL
Fluorene	mg/kg-dry	<RL	---	---	<RL	0.22	<RL	<RL	<RL
Indeno[1,2,3-cd]pyrene	mg/kg-dry	<RL	---	---	<RL	1.3	<RL	<RL	<RL
Naphthalene	mg/kg-dry	<RL	0.93	---	<RL	0.19	<RL	<RL	<RL
Phenanthrene	mg/kg-dry	<RL	1.17	0.36	<RL	3.2	<RL	<RL	<RL
Pyrene	mg/kg-dry	<RL	1.54	0.54	<RL	5.2	<RL	<RL	<RL
DRY WEIGHT									
DRY WEIGHT	wt%	90.8	95	93.2	98.6	85	94.7	95.3	94.8

Source: Results from samples collected in 2001 were obtained from Table 2, Initial Phase II for the Studebaker Area /

Notes: NA - Data Not Available

RL - Reporting Limit

Surface Soil - Defined as the upper two feet of the soil column.

Subsurface Soil - Defined as the soil below a depth of two feet.

1996 Cleanup Criteria from 1996 VRP Resource Guide Tables 9, 10, and 14

RISC Cleanup Criteria from RISC Technical Guide Appendix 1 (Updated September 9, 2009)

RCRA hazardous waste criteria for lead and arsenic is 5 mg/l.

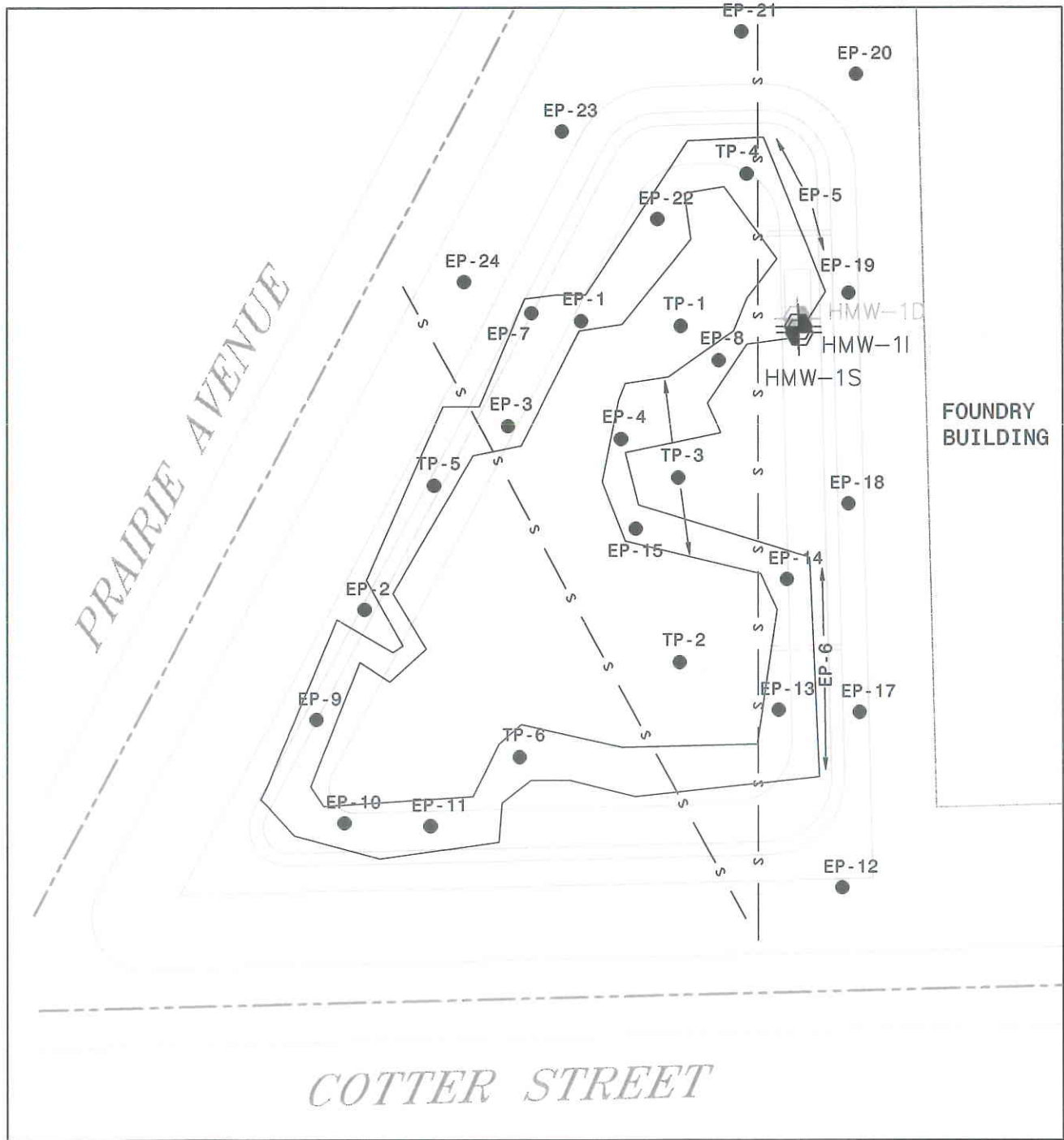
2
2

TABLE 2
TEST/EXPLORATORY PIT DESCRIPTION
FORMER STUDEBAKER FOUNDRY BUILDING
FEBRUARY 4, 2010

Location	Description	Total Depth of Excavation (from ground surface)
TP-1	No debris	5'
TP-2	No debris	5'
TP-3	Brick, cans, cups, rubber mats, tarp, bottles, metal scraps, glass, wires, metal conduit, leather scraps and concrete blocks	7'
TP-4	metal scraps chains, plastic and bricks	7'
TP-5	No debris	6'
TP-6	Barrel lids, conduit, metal stripping, concrete blocks, tires, glass, empty 55 gallon drum, christmas decorations, wood blocks and concrete slabs	6'
EP-1	conduit bricks, wiring, empty 10 gal can of prestone, wood bricks, conduit, metal scraps, and rubber tubing	5'
EP-2	No debris, possibly stockpiled topsoil	3'
EP-3	No debris	2'
EP-4	Brick, cans, cups, rubber mats, tarp, bottles, metal scraps, lids, glass, wires, and metal conduit	5'
EP-5	concrete	2'
EP-6	metal fencing scraps	2'
EP-7	wood bricks, tire, and tubing	5'
EP-8	Smoke stack part, rubber belts, electrical wiring (with plugs) metal strips, and chains	5'
EP-9	No debris	4'
EP-10	No debris	4'
EP-11	No debris	4'
EP-12	No debris	4'
EP-13	No debris	5'
EP-14	No debris	5'
EP-15	copper strips, empty metal buckets	5'
EP-16	Pea gravel	3'
EP-17	No debris	5'
EP-18	No debris, encountered old sidewalk	2'
EP-19	No debris, encountered old sidewalk	2'
EP-20	No debris, encountered old sidewalk	2'
EP-21	Large quantity of bricks and some piping	6'
EP-22	Bricks, wire, metal conduit	5'
EP-23	No debris, possibly stockpiled topsoil	3'
EP-24	No debris, possibly stockpiled topsoil	3'

TP Test Pit - Soil samples collected for analysis
EP Exploratory Pit - No soil samples collected for analysis

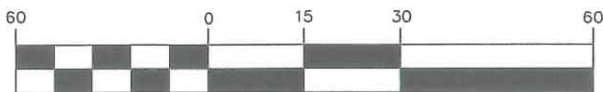
FIGURE



LEGEND:

- TP-1 APPROXIMATE LOCATION OF TEST PIT
- EP-2 APPROXIMATE LOCATION OF EXPLORATORY PIT
- ⊙ HMW-240 DEEP MONITORING WELL LOCATIONS
- ⊙ HMW-BS MONITORING WELL NEST LOCATIONS (S=SHALLOW, I=INTERMEDIATE)
- s — APPROXIMATE LOCATION OF SEWER LINE BISECTING THE PROPERTY

APPROXIMATE GRAPHIC SCALE



(IN FEET)
1 inch = 30 ft.



NOTE
THIS SITE MAP WAS CREATED FROM DRAWINGS PROVIDED BY C. RIGHTLEY, C.A. McCARRISON (DRAWING #56652, 6/48), THE SIDWELL COMPANY, AND HULL & ASSOC., INC. ALL INFORMATION REPRESENTED ON THIS DRAWING IS APPROXIMATE AND SHOULD BE USED FOR GENERAL PURPOSES ONLY.

**TEST PIT LOCATION MAP
FORMER STUDEBAKER FOUNDRY
1100 PRAIRIE AVENUE
SOUTH BEND, IN**

Weaver Boos Consultants

4085 MEGHAN BEELER COURT
SOUTH BEND, IN 46628
(574) 271-3447

DRAWN BY: RMD	DATE: 1/15/2010	FILE: 0058-373-01
REVIEWED BY: ES	CAD: SITELOC.DWG	FIGURE 1