Extended Site Screening (ESS)

Site Name: Metals - McKee Button Company

Project Manager: Matt Culp Date: 11/18/2020

Location: (Decimal Degree format)

Latitude: 41.4156 Longitude: 91.0672 **County**: Muscatine

USGS Quadrant: Muscatine

Site Size: 1.4 **Site Dimension:** ☒ Acres ☐ Square Feet ☐ Feet ☐ Square Miles ☐ Miles

Site Alias Name(s): Beach & Stortz Lumber Company

Congressional District: Iowa 2nd

Grant Recipient Name: NA

Grant Recipient Address: NA

Grant Recipient Phone: NA **Grant Recipient Email:** NA

Current Owner: McKee Button Company C/O Jim McKee

Current Owner Address: 1000 Hershey Avenue Muscatine Iowa 52761

If different from current owner:

Responsible Party Name(s): Same

Responsible Party Address: Same

Site Street Address or Tier, Range, Section & Subsections (if street address is unknown)

1000 Hershey Avenue Muscatine Iowa 52761

Directions to site: From Des Moines travel east on Interstate 80, turn south on I-380/218/27 to Highway 22 east. At Muscatine, turn south on Highway 61, Turn east at Hershey Avenue the site is located on the right, next to the river.

Summarize the site history (past usages, past ownerships, wastes, known or suspected contamination pathways such as tanks, septic tank/tile field, lagoon, land applications, SW burial, etc.)

The Site consists of two parcels located at 1000 Hershey Avenue in Muscatine, Iowa. It is located on the southeastern side of the city, south of Hershey Avenue and north of the Mississippi River. The site was originally developed in the 1890s as Hershey Lumber Company. The Chicago, Rock Island, and Pacific railroad was located south of the site. In 1905, a couple of storage buildings were constructed on the site with the Hershey Lumber Yard now relocated west of the site. In 1912, the site is occupied by McKee Button Company. In 1938, there are buildings on the site along with residential and commercial buildings to the west and the north across from Hershey Avenue with no major changes noted until a building was constructed on the west side of the site in 1963 which was demolished by 1976. In 1994, the area west of the site was a residential area. The site is currently occupied by a multi-story brick building utilized as the McKee Button Factory offices, museum, and manufacturing operations. The site includes eight buildings used for manufacturing. There is no evidence of dumping at the site or stained ground or stressed vegetation. There was a storage area dedicated to used oil. There was also a rail spur observed on the south end of the site. The rail spur was removed in 2019 and covered with rocks. No hazardous material containers were observed and no on-site solid waste disposal or any current or former on-site landfills, although dumping was reported.

Briefly describe the site assessment that was conducted (number of borings, monitoring wells, number of samples, depth of soil samples and monitoring wells, analysis, etc.)

After review of the Phase II a supplemental assessment was ordered by Iowa DNR and included;

- One soil boring (BG) that was completed off-site in the right-of-way owned by the City of Muscatine to evaluate local background arsenic concentrations in shallow soil.

- Three soil borings (BH-2A, BH-2B and BH-2C) were completed to delineate the extent of semi-volatile organic compound (SVOCs) contamination previously identified in soil at soil boring BH2.

- Three temporary monitoring wells (TMW-2A, TMW-3A and TMW-4A) were advanced to 20 feet deep adjacent to previously completed monitoring wells TMW-2, TMW-3, and TMW-4, respectively. These wells were completed to evaluate volatile organic compounds (VOCs), SVOCs, and eight metals detected previously in the groundwater.

Summarize the findings and conclusions regarding the contaminants found and their extent and concentrations. Relate those values to known criteria such as statewide standards, MCLs, water quality standards, background levels or other benchmarks used to determine site priority.

Summary of ISS Soil Findings:

Metals:

Soil samples collected from BH1, BH2, BH3, BH4, and BH5 were analyzed for metals. Each sample had detected concentrations above the MDL and RL except silver. However, the only parameter that exceeded statewide standards was arsenic. The samples that exceeded the statewide standard for arsenic of 1.9 mg/kg were at soil sample location BH1 (3.5-5 feet) at 2.47 mg/kg, (at 10-11.5 ft.) at 2.81 mg/kg, and sample location BH3 (0-1.5 ft.) at 5.18 mg/kg.

Note: Samples from sample location BH2 (0-1.5 ft.) and (5.5-7 ft.) and at sample location BH5 (0.0-1.5 ft.) had MDLs of 1.96 mg/kg, and 2.27 mg/kg and 4.68 mg/kg, respectively, which exceed the IDNR standard. These samples are being included as exceedances because the MDLs exceed the Iowa DNR statewide standard. The samples required dilutions and likely have arsenic concentrations that exceed the 1.9 mg/kg standard. Background soil samples will be required for comparison to these detected levels.

Volatile Organic Compounds (VOC):

VOCs were detected in multiple samples above however, there were no VOC exceedances of statewide standards.

Semi-volatile organic compounds (SVOC):

SVOCs were generally not detected in soil with the exception of sample location bore hole BH2 (0-1.5) feet which had multiple significant exceedances of PAH compounds of the SWS for soil. Compounds that exceeded the SWS include: benzo(a)anthracene, (8.71mg/kg) and the SWs is 3.1 mg/kg, benzo(a)pyrene at 8.15 and the SWS is 2.43 mg/kg, benzo(b)fluoranthene at 9.67mg/kg and the SWS is 3.1mg/kg, dibenz(a,h)anthracene was 1.34mg/kg and the SWS is 0.31mg/kg, and indeno(1,2,3-cd)pyrene was 4.93 and the SWS is 3.1mg/kg. Resampling of soil boring BH2 will be required to determine the extent of contamination

PCBs:
No PCBs were detected in the soil at concentrations above the MDLs

ESS Soil Findings:

Arsenic:
Arsenic concentrations for the initial Phase II ranged from 1.08 mg/kg to 5.18 mg/kg. The SWS of 1.9 mg/kg was exceeded at three sample locations. For the ESS, an additional background off-site soil sample was collected from the city right-of way east of the site (BG 0-2') for comparison to the on-site concentrations of arsenic. The arsenic concentration in the BG 0-2' sample was 7.29 mg/kg and is similar to arsenic concentrations on site. As such, the onsite arsenic levels observed in soil is interpreted as reflective of background conditions.

SVOCs:
The soil sample from soil boring BH2 (0-1.5') from the Phase II had multiple exceedances of SWS for SVOCs. Additional sampling near BH2 was conducted to confirm the extent of SVOC soil contamination in this area. Three soil borings (BH2A, BH2B, and BH2C) were completed to depth of 2 feet approximately 10-feet away from BH2. At sample location BH2A and BH2C, SVOCs were detected but at concentrations less than the statewide standards, and SVOCs were not detected in BH2B (See Table 1). The additional sampling defined the extent of SVOC soil contamination to a limited surface area near BH2.

PCBs:
No PCBs were detected in the soil at concentrations above the MDLs.

Table 1: Results for Soil

COMPOUND/ LOCATION	BG 0-2'	BH1 3.5-5'	BH1 10-11.5'	BH2 0-1.5'	BH-2A 0-2'	BH-2B 0-2'	BH-2C 0-2'	BH2 5.5-7'	BH3 0-1.5'	BH3 5-7'	BH4 0-1.5'	BH4 18.5-20'	BH5 0-1.5'	BH5 7-8'	SWS FOR SOIL
Date ISS/ESS	10/29 ESS	8/3 ISS	8/3 ISS	8/3 ISS	10/29 ESS	10/29 ESS	10/29 ESS	8/3 ISS	8/3 ISS	8/3 ISS	8/3 ISS	8/3 ISS	8/3 ISS	8/3 ISS	
METALS (mg/kg)															
Arsenic	7.29	2.47	2.81	*< 1.96*	-	-	-	*< 2.37*	5.18	ND	ND	ND	*< 4.68*	1.08	**1.9**
Barium	-	93.9	106	57.0	-	-	-	72.9	133	98.6	52.2	86.7	69.2	107	15,000
Cadmium	-	0.438	0.623	0.637	-	-	-	0.779	0.528	0.726	0.53	0.28	ND	0.551	70
Chromium	-	17.5	16.7	9.79	-	-	-	13.1	11.7	12.4	9.89	15.1	6.26	13.1	190
Lead	-	38.9	15.9	65.9	-	-	-	64.1	16.8	178	59.8	9.15	84.9	30.5	400
Mercury	-	0.0218	0.0289	0.0318	-	-	-	0.05	0.0417	0.0823	0.093	0.02	1.41	0.676	23
VOCs (mg/kg)					-	-	-								
Acetone	-	0.117	0.0883	ND	-	-	-	0.04	0.037	ND	0.0752	0.0600	ND	0.0840	68,000
2-butanone (MEK)	-	ND	0.0160	ND	-	-	-	ND	ND	ND	0.0100	0.0117	ND	0.0186	46,000
Carbon disulfide	-	ND	0.0042	ND	-	-	-	ND	0.0073	ND	ND	ND	ND	ND	7,600
Chloroform	-	ND	ND	ND	-	-	-	ND	ND	0.004	ND	ND	ND	ND	760
p-Isopropyltoluene	-	0.344	0.0179	ND	-	-	-	0.07	ND	ND	ND	ND	ND	ND	NA
Toluene	-	ND	ND	ND	-	-	-	ND	0.0273	0.012	ND	ND	ND	ND	6,100
SVOCs (mg/kg)															
Acenaphthene	-	ND	ND	2.93	0.753	<0.46	<0.454	ND	ND	ND	ND	ND	ND	ND	3400
Anthracene	-	ND	ND	4.96	1.25	<0.48	<0.466	ND	ND	ND	ND	ND	ND	ND	17,000
Benzo(a)anthracene	-	ND	ND	8.71	1.97	<0.48	0.549	ND	ND	ND	ND	ND	ND	ND	3.1
Benzo(a)pyrene	-	ND	ND	8.15	1.89	<0.59	0.769 J	ND	ND	ND	ND	ND	ND	ND	2.3
Benzo(b)fluoranthene	-	ND	ND	9.67	2.27	<0.46	0.558	ND	ND	ND	ND	ND	ND	ND	3.1
Benzo(g,h,i)perylene	-	ND	ND	4.69	1.08	<0.56	<0.549	ND	ND	ND	ND	ND	ND	ND	170
Benzo(k)fluoranthene	-	ND	ND	3.93	0.912	<0.53	<0.513	ND	ND	ND	ND	ND	ND	ND	31
Bis(2-ethylhexyl) phthalate	-	0.322	ND	1.26	<0.63	<0.60	<0.590	ND	ND	ND	ND	ND	1.18	ND	170
Carbazole	-	ND	ND	2.84	0.814	<0.52	<0.507	ND	ND	ND	ND	ND	ND	ND	120
Chrysene	-	ND	ND	8.68	1.99	<0.51	0.523	ND	ND	ND	ND	ND	ND	ND	310
Dibenz(a,h)anthracene	-	ND	ND	1.34	<0.46	<0.44	<0.431	ND	ND	ND	ND	ND	ND	ND	0.31
Dibenzofuran	-	ND	ND	2.25	1.18	<0.56	<0.543	ND	ND	ND	ND	ND	ND	ND	76
Di-n-butyl phthalate	-	ND	ND	1.59	<0.61	<0.59	<0.578	ND	ND	ND	ND	ND	ND	ND	6,100
Fluoranthene	-	ND	ND	22.6	5.34	<0.44	1.22	2.44	ND	ND	ND	ND	ND	ND	2300
Fluorene	-	ND	ND	2.98	1.67	<0.44	<0.431	ND	ND	ND	ND	ND	ND	ND	2300
Indeno(1,2,3-cd)pyrene	-	ND	ND	4.93	1.49	<0.48	0.529	ND	1.01	1.07	ND	ND	ND	ND	3.1
2-methylnapthalene	-	ND	ND	1.55	0.911	<0.41	<0.401	ND	ND	ND	ND	ND	ND	ND	230
Naphthalene	-	ND	ND	3.00	<0.47	<0.45	<0.442	ND	ND	ND	ND	ND	ND	ND	1,100
Phenanthrene	-	ND	ND	23.1	6.70	<0.45	0.736	1.80	ND	ND	ND	ND	ND	ND	1,700
Pyrene	-	ND	ND	18.4	4.30	<0.50	1.12	1.92	ND	ND	ND	ND	ND	ND	1,700

Summary of ISS Groundwater Findings:

Metals:
Extremely elevated levels of metals were detected in groundwater at concentrations that exceed the SWS for protected groundwater. Groundwater samples were not filtered for sediment removal. The detections are summarized below.

- The SWS for arsenic for protected groundwater of 10ug/L was exceeded at all five groundwater sample locations with observed detections ranging from 27.8ug/L to 308ug/L.

- The SWS for barium for protected groundwater of 2,000ug/L was exceeded at three sample locations (TMW-3, TMW-4, and TMW-5). The barium concentration in TMW-3 was 6,850ug/L, the concentration at TMW-4 was 5,590ug/L and at TMW-5 the barium concentration of 6,890ug/L.

- The SWS for cadmium for protected groundwater of 5.0ug/L was exceeded at all five groundwater sample locations with concentration values ranging from 229.0ug/L 63.0ug/L.

- The SWS for chromium for protected groundwater of 100ug/L was exceeded at four sample locations TMW-2, TMW-3, TMW-4 and TMW-5 with concentrations ranging from 111ug/L to 731.0ug/L.

- The SWS for lead for protected groundwater of 15.0ug/L was exceeded at all five groundwater sample locations with concentrations ranging from 88.5ug/L to 13,300ug/L.

- The SWS for mercury for protected groundwater of 2.0ug/L was exceeded at two sample locations (TMW-3 and TMW-5). The mercury concentration in TMW-3 was 2.50ug/LL and at TMW-5 was 2.37ug/L.

- The SWS for selenium for protected groundwater of 50.0ug/L was exceeded at one sample location (TMW-5) which had a concentration of 53.4ug/L.

VOCs:
VOCs Groundwater samples collected from TMW-1, TMW-2, TMW-3, TMW-4, and TMW-5 were analyzed for VOCs. Acetone was detected in samples TMW-1, TMW-2, TMW-4, and TMW5, benzene was detected in sample TMW-3, carbon disulfide was detected in samples TMW4, and p-Isopropyltoluene was detected in samples TMW-1, TMW-2, and TMW-3. No samples exceeded the statewide standard for a protected groundwater source for acetone, benzene, and carbon disulfide. P-Isopropyltoluene does not have a statewide standard.

Note: The detection limit for five non-detect VOC compounds; 1, 1, 2, 2-tetrachloroethane, 1, 2, 3 trichloro-propane, 1, 2-dibromo-3-chloropropane, 1, 2-dibro-moethane (EDB), and hexachloro-butadiene are higher than the statewide standards.

SVOCs:
SVOCs were not detected at concentrations above MDLs. However The MDLs for 12 SVOC compounds are higher than the statewide standards. These VOCs included; 2, 4-dinitrotoluene, 2, 6-dinitrotoluene, 3,3-dichlorobenzidine, benzidine, benzo-(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, bis(2-chloroethyl)ether, dibenz(a,h)-anthracene, indeno(1,2,3-cd)pyrene, n-nitrosodimethylamine, and pentachlorophenol were reported as non-detect but the detection limits are higher than the SWS.

Groundwater samples collected during the initial Phase II from temporary groundwater monitoring wells TMW-1, TMW-2, TMW-3, TMW-4, and TMW-5 were analyzed for total metals and contained significant sediment which required dilution and re-acidification by the laboratory prior to analysis. The analytical results of the ISS identified metals exceeding SWS in all five sample locations.

ESS Groundwater Findings:

Metals:
For the ESS, groundwater was resampled. Three additional temporary monitoring wells (TMW-2A, TMW-3A, and TMW-4A) were installed to depth of 20 feet adjacent to the previous monitoring location. Groundwater samples were filtered to remove sediment and determine dissolved metal concentrations. The analytical results for the second (filtered) groundwater samples indicated that no dissolved metals exceeded SWS (See Table 2).

VOCs and SVOCs:
The initial Phase II reported some volatile organic compounds (VOCs) and all semi-volatile organic compounds (SVOCs) in groundwater as non-detects; however, some of the non-detections were based on method detection limits (MDLs) that were higher than the SWS for a protected groundwater source. Therefore re-analysis was required. Re-analysis of VOCs and SVOCs was conducted using an analytical methods (8270D SIM and 8270E SIM) that are capable of lower detection limits in line with SWS. The results were that SVOC compound dibenz(a,h)anthracene was detected at TMW-3A at a concentration 0.570ug/L exceeding the SWS of 0.024ug/L and was the only VOC or SVOC identified that exceeds established SWS. (See Table 2).

PCB:
No PCBs were detected in groundwater

Table 2: Groundwater Analytical Results
(Note J code data approximate values and B code data detections in blank samples)

Compounds	TMW-1 ISS Sample date 8/3/2020	TMW-2 ISS Sample date 8/3/2020	TMW-2A ESS Sample date 10/29/2020	TMW-3 ISS Sample date 8/3/2020	TMW-3A ESS Sample date 10/29/2020	TMW-4 ISS Sample date 8/3/2020	TMW-4A ESS Sample date ISS 10/29/2020	TMW-5 ISS Sample date 8/3/2020	Statewide Standard for Protected Groundwater Source
METALS (mg/L)			**(field filtered)**		**(field filtered)**		**(field filtered)**		
Arsenic	**0.0278**	**0.0386**	0.00124 J	**0.250**	ND	**0.308**	0.00728	**0.227**	0.01
Barium	1.71	1.17	0.335	**6.85**	0.455	**5.59**	0.409	**6.89**	2
Cadmium	**0.0109**	0.00344	ND	**0.0634**	ND	**0.0130**	ND	**0.0229**	0.005
Chromium	0.0694	**0.111**	ND	**0.607**	ND	**0.674**	ND	**0.731**	0.1
Lead	**0.0885**	**0.282**	ND	**13.3**	ND	**0.780**	0.000893	**2.34**	0.015
Mercury	0.000161 J B	0.000356 B	ND	**0.00250 B**	ND	0.00189 B	ND	**0.00237 B**	0.002
Selenium	ND	0.00688 J	ND	0.0330 J	ND	ND	ND	**0.0534**	0.05
Silver	ND	0.00154 J	ND	0.0172	ND	ND	ND	0.00702 J	0.1
VOCs (mg/L)									
Acetone	0.00364 J	0.0074 J	-	ND	-	0.00373 J	-	0.0123	6.3
Benzene	ND	ND	-	0.000732	-	ND	-	ND	0.005
Carbon Disulfide	0.000486 J	ND	-	ND	-	0.000569 J	-	ND	0.7
p-Isopropyltoluene	0.000939 J	0.0215	-	0.000697 J	-	ND	-	ND	NS
1,1,2,2-tetrachloroethane	*<0.00047*	*<0.00047*	ND	*<0.00047*	ND	*<0.00047*	ND	*<0.00047*	0.0003
1,2,3-trichloropropane	*<0.00059*	*<0.00059*	ND	*<0.00059*	ND	*<0.00059*	ND	*<0.00059*	0.0000058
1,2-dibromo-3-chloropropane	*<0.0012*	*<0.0012*	ND	*<0.0012*	ND	*<0.0012*	ND	*<0.0012*	0.0002
1,2-dibromoethane (EDB)	*<0.00034*	*<0.00034*	ND	*<0.00034*	ND	*<0.00034*	ND	*<0.00034*	0.00005
hexachlorobutadiene	*<0.0014*	*<0.0014*	ND	*<0.0014*	ND	*<0.0014*	ND	*<0.0014*	0.001
SVOCs (mg/L)[b]							-		
Benzo(a)anthracene	*<0.00113*	*<0.00147*	ND	*<0.00126*	ND	*<0.00157*	ND	*<0.00133*	0.00024
Benzo(a)pyrene	*<0.00155*	*<0.002*	ND	*<0.00172*	ND	*<0.00214*	ND	*<0.00181*	0.0002
Benzo(b)fluoranthene	*<0.00124*	*<0.0016*	ND	*<0.00138*	0.000177	*<0.00171*	ND	*<0.00145*	0.00024
Dibenz(a,h)anthracene	*<0.00196*	*<0.00253*	*<0.0000651*	*<0.00218*	**0.000570**	*<0.00271*	*<0.0000622*	*<0.00229*	0.000024
Indeno(1,2,3-cd) pyrene	*<0.00206*	*<0.00267*	ND	*<0.0023*	0.000192	*<0.00286*	ND	*<0.00241*	0.00024
PCBs (mg/L)									
All	ND	ND	-	ND	-	ND	-	ND	Varies

Notes: mg/L – milligrams per
Red Bold = detected concentration exceeds IDNR statewide standard for a protected groundwater source
ND = Parameter not detected above RL or MDL; for parameters with a statewide standard the MDL is less than the statewide standard for a protected groundwater source < Value in Italics = Parameter MDL exceeds statewide standard for a protected groundwater source
J – Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value
B – Compound was found in blank and sample

Identify on-site or off-site potential and actual targets (e.g., municipal wells, private wells, drinking water intakes). What is known of the neighboring area, i.e., are there residences, businesses, public use areas, etc.? Are there utility lines that could be impacted by site contaminants? Identify any other use/location issues that deserve consideration.

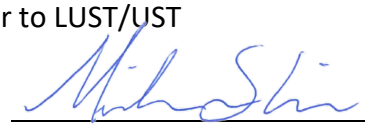
The site is located on the shore of the Mississippi River. There is mixed residential and commercial property to the north and west. The Iowa DNR did not identify any on-site groundwater wells. Two wells were identified in the Iowa Geological Survey's Geosam database. The first well is located to the southeast of the site and was drilled to a depth of 537 feet in 1988. The second well is approximately 0.7 miles northeast of the site and was drilled in 1998 to a depth of 581 feet and has a static depth to water of 40.0 feet. Neither well is considered at risk from the site.

Summarize the reasoning, knowledge or any other information used in determining your recommendation regarding the priority assigned to this site.

The recommendation to defer this site from further action under CERCLA is based on limited extent of metals and SVOC contamination in soil and concentrations of dissolved metals in groundwater at levels below SWS for protected groundwater source confirmed during supplemental assessment.

Site recommended for:

- ☒ No further action under CERCLA
- ☐ Additional investigation under state program (activity code 2824)
- ☐ Additional investigation under CERCLA (Extended Site Screening)
- ☐ Transfer to LUST/UST

Form Reviewed:  **Date Reviewed:** 11/17/2020