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FACSIMILE TRANSMITTAL

To: Andy Boettcher
Organization: WDNR
Fax Number: 414-263-8483
Phone Number: 414-263-8541
RE: Fmr Crane Mfg soil data

From: Adam Rode AJR
Date: March 5, 2004
Total number of pages including cover: 8
Project Number: 8069

☐ Urgent ☒ For review ☐ Please comment ☒ Please reply

Notes / Comments:

Andy,

Attached is a summary of PAH soil quality data from sidewall and test pit samples collected from the GP-22 area of PAH impacts. The SW-1 through SW-7 series of samples are from the initial excavation sidewalls, the SW-1R through SW-7R series of samples are from the expanded excavation sidewalls (5 feet extra to the east, south, and west after initial results were received), and TP-1 through TP-8 represent test pit samples in an effort to better define the PAH extents. The current excavation limits have been surveyed and are overlaid on one of our existing base maps.

As discussed, some residual PAH impacts still exist above WDNR interim guidance RCLs for the migration to groundwater pathway (our anticipated clean up goal). The impacts do not readily correlate to types of fill material encountered in this area (i.e., apparent shot blast/foundry sand, re-worked native soils) and are quite sporadic with regard to location and types of fill. We feel that the current excavation has greatly reduced the original PAH mass in this area, and that residual impacts will be addressed through surface covers (clay cap, site drives/roads) in this area of the site to prevent direct contact and also minimize precipitation infiltration. Additional digging may not totally remediate the area of PAHs, due to the fill mass in the southern portion of the site. Furthermore, post-remediation groundwater samples will be collected from nearby wells MW-5 and MW-6, plus we plan to install another well near the south edge of this excavation, as previously planned, to monitor groundwater in this immediate area. Low flow sampling methods will be utilized for future groundwater samples to be analyzed for PAHs.

After you look at the data, please give me a call on Tuesday to discuss the findings and our intentions to backfill the excavation area soon.

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Table 1
Post-Remediation Soil Quality Results (GP-22 Area)
Former Crane Manufacturing - 6000 S. Buckhorn Avenue, Cudahy, Wisconsin
Sigma Project No. 8069

Soil Sample Location:		SW-1		SW-1R		SW-2		SW-2R			Soil Cleanup Objective[2]
Sample Depth (feet bgs):		2	8	2	8	2	8	2	---	8	
	Date:	02/13/04	02/13/04	02/18/04	02/18/04	02/13/04	02/13/04	02/18/04	---	02/18/04	
PAHs											
Acenaphthene	µg/kg	1,790	<114	<124	<1,120	163	<1,050	<146	---	<1,540	38,000
Acenaphthylene	µg/kg	<219	<229	<248	<2,240	512	<2,100	<291	---	<3,070	700
Anthracene	µg/kg	109	<114	<124	<1,120	270	<1,050	<146	---	<1,540	3,000,000
Benzo(a)anthracene	µg/kg	1,140	63.7	173	1,190	1,420	1,240	<72.8	---	1,050	17,000
Benzo(a)pyrene	µg/kg	1,430	81.7	206	1,570	2,110	1,650	24.6	---	1,360	48,000
Benzo(b)fluoranthene	µg/kg	3,500	149	502	2,650	3,530	3,780	<72.8	---	2,760	360,000
Benzo(ghi)perylene	µg/kg	2,920	130	421	2,210	2,990	3,010	<146	---	2,200	6,800,000
Benzo(k)fluoranthene	µg/kg	1,390	<114	170	<1,120	1,390	1,390	<146	---	<1,540	870,000
Chrysene	µg/kg	1,620	<114	252	1,590	1,780	1,760	<146	---	1,690	37,000
Dibenzo(a,h)anthracene	µg/kg	515	84.0	492	2,030	484	584	<7.28	---	2,340	38,000
Fluoranthene	µg/kg	968	<114	223	1,170	1,560	1,240	<146	---	<1,540	500,000
Fluorene	µg/kg	<109	<114	<124	<1,120	<108	<1,050	<146	---	<1,540	100,000
Indeno(1,2,3-cd)pyrene	µg/kg	3,470	169	491	2,510	3,210	3,070	<72.8	---	2,590	680,000
1-Methylnaphthalene	µg/kg	988	<114	<124	1,920	636	<1,050	<146	---	<1,540	23,000
2-Methylnaphthalene	µg/kg	1,360	<114	<124	1,970	986	<1,050	<146	---	<1,540	20,000
Naphthalene	µg/kg	**413**	<114	<124	<1,120	**605**	<1,050	<146	---	<1,540	400
Phenanthrene	µg/kg	517	<114	<124	<1,120	892	<1,050	<146	---	<1,540	1,800
Pyrene	µg/kg	762	<114	<124	<1,120	288	1,050	<146	---	<1,540	8,700,000
Soil Sample Location:		SW-1		SW-1R		SW-2		SW-2R			Soil Cleanup Objective[2]
Sample Depth (feet bgs):		2	8	2	8	2	8	2	2	8	
	Date:	02/16/04	---	02/18/04	02/18/04	---	---	02/18/04	02/18/04	02/18/04	
CVOCs & Detected VOCs									Fixed lab		
Tetrachloroethene	µg/kg	<50	NA	<50	<50	NA	NA	<50	<25.0	<50	1,230
Trichloroethene	µg/kg	<50	NA	<50	<50	NA	NA	<50	<25.0	<50	850
cis-1,2-Dichloroethene	µg/kg	<50	NA	<50	<50	NA	NA	<50	<25.0	<50	156,000
trans-1,2-Dichloroethene	µg/kg	<50	NA	<50	<50	NA	NA	<50	<25.0	<50	313,000
Benzene	µg/kg	NA	NA	NA	NA	NA	NA	NA	<25.0	NA	---
Toluene	µg/kg	NA	NA	NA	NA	NA	NA	NA	<25.0	NA	---
Xylenes (total)	µg/kg	NA	NA	NA	NA	NA	NA	NA	<25.0	NA	---
Naphthalene	µg/kg	NA	NA	NA	NA	NA	NA	NA	<25.0	NA	---

Notes:
1. µg/kg = micrograms per kilogram (equivalent to parts per billion, ppb)
2. Soil Cleanup Objectives established in Sigma's November 20, 2003 letter report to WDNR:
   Cleanup Objectives for CVOCs based on lowest direct contact RCLs for non-industrial sites as presented in WDNR publication PUB-RR-682 *"De*
   Cleanup Objectives for PAHs based on migration to groundwater RCL as presented in WDNR publication RR-519-97 *"Soil Cleanup Levels for Pc*
3. --- = no cleanup object defined for remediation work
4. All PAH samples analyzed at Great Lakes Analytical fixed-base laboratory.
5. VOC samples analyzed by New Age/Landmark mobile laboratory in the field; duplicate (confirmation) VOC samples analyzed at Great Lakes fixed-b
6. Exceedances: **bold, box** = Concentration exceeds Soil Cleanup Objective

Table 1
Post-Remediation Soil Quality Results (GP-22 Area)
Former Crane Manufacturing - 6000 S. Buckhorn Avenue, Cudahy, Wisconsin
Sigma Project No. 8069

Soil Sample Location:		SW-3		SW-3R		SW-4		SW-5			SW-5R		Soil Cleanup Objective[2]
Sample Depth (feet bgs):		2	8	2	8	2	8	2	---	8	2	8	
	Date:	02/13/04	02/13/04	02/18/04	02/18/04	02/16/04	02/16/04	02/16/04	---	02/16/04	02/20/04	02/20/04	
PAHs													
Acenaphthene	µg/kg	<120	204	<1,300	367	<1,040	<111	<114	---	1,100	213	<112	38,000
Acenaphthylene	µg/kg	<239	**1,030**	<2,590	<565	<2,070	<222	<228	---	601	<210	<224	700
Anthracene	µg/kg	<120	396	<1,300	<283	1,370	<111	197	---	5,410	1,630	<112	3,000,000
Benzo(a)anthracene	µg/kg	<59.8	1,670	2,110	1,120	3,430	185	690	---	7,120	4,270	<56.0	17,000
Benzo(a)pyrene	µg/kg	<5.98	1,860	2,470	1,590	2,510	113	590	---	4,680	2,430	<24.8	48,000
Benzo(b)fluoranthene	µg/kg	<59.8	3,830	4,960	2,350	3,520	162	749	---	5,850	3,430	<56.0	360,000
Benzo(ghi)perylene	µg/kg	<120	2,950	3,800	1,720	1,920	<111	425	---	2,360	1,790	<112	6,800,000
Benzo(k)fluoranthene	µg/kg	<120	1,450	1,840	935	1,510	<111	321	---	2,750	1,430	<112	870,000
Chrysene	µg/kg	<120	2,320	2,800	1,410	2,990	154	870	---	7,530	4,180	<112	37,000
Dibenzo(a,h)anthracene	µg/kg	<5.98	595	3,790	1,600	<51.8	17.1	487	---	471	2,110	<5.60	38,000
Fluoranthene	µg/kg	<120	2,730	2,490	1,230	5,790	240	1,240	---	17,400	5,770	<112	500,000
Fluorene	µg/kg	<120	248	<1,300	<283	<1,040	<111	<114	---	1,380	394	<112	100,000
Indeno(1,2,3-cd)pyrene	µg/kg	<59.8	3,110	4,280	1,930	2,150	89.2	452	---	2,540	2,080	<56.0	680,000
1-Methylnaphthalene	µg/kg	<120	935	<1,300	<283	<1,040	<111	<114	---	693	522	<112	23,000
2-Methylnaphthalene	µg/kg	<120	2,060	1,680	517	<1,040	144	586	---	<111	<105	<112	20,000
Naphthalene	µg/kg	<120	**967**	<1,300	360	<1,040	<111	<114	---	<1,110	<105	<112	400
Phenanthrene	µg/kg	<120	**2,000**	1,330	621	**2,960**	<111	532	---	**11,200**	**3,660**	<112	1,800
Pyrene	µg/kg	<120	340	1,460	606	2,820	134	681	---	5,920	3,190	<112	8,700,000
Soil Sample Location:		SW-3		SW-3R		SW-4		SW-5			SW-5R		Soil Cleanup Objective[2]
Sample Depth (feet bgs):		2	8	2	8	2	8	2	2	8	2	8	
	Date:	---	---	02/18/04	02/18/04	02/16/04	02/16/04	02/16/04	02/16/04	02/16/04	---	---	
CVOCs & Detected VOCs									Fixed lab				
Tetrachloroethene	µg/kg	NA	NA	<50	<50	<50	<50	<50	<25.0	<50	NA	NA	1,230
Trichloroethene	µg/kg	NA	NA	<50	140	<50	<50	<50	<25.0	<50	NA	NA	850
cis-1,2-Dichloroethene	µg/kg	NA	NA	<50	690	<50	<50	<50	<25.0	<50	NA	NA	156,000
trans-1,2-Dichloroethene	µg/kg	NA	NA	<50	<50	<50	<50	<50	<25.0	<50	NA	NA	313,000
Benzene	µg/kg	NA	NA	NA	NA	NA	NA	NA	<25.0	NA	NA	NA	---
Toluene	µg/kg	NA	NA	NA	NA	NA	NA	NA	<25.0	NA	NA	NA	---
Xylenes (total)	µg/kg	NA	NA	NA	NA	NA	NA	NA	<25.0	NA	NA	NA	---
Naphthalene	µg/kg	NA	NA	NA	NA	NA	NA	NA	<25.0	NA	NA	NA	---

Notes:
1. µg/kg = micrograms per kilogram (equivalent to parts per billion, ppb)
2. Soil Cleanup Objectives established in Sigma's November 20, 2003 letter report to WDNR:
   Cleanup Objectives for CVOCs based on lowest direct contact RCLs for non-industrial sites as presented in WDNR publication PUB-RR-682 *"Determining Residual Co*
   Cleanup Objectives for PAHs based on migration to groundwater RCL as presented in WDNR publication RR-519-97 *"Soil Cleanup Levels for Polycyclic Aromatic Hy*
3. --- = no cleanup object defined for remediation work
4. All PAH samples analyzed at Great Lakes Analytical fixed-base laboratory.
5. VOC samples analyzed by New Age/Landmark mobile laboratory in the field; duplicate (confirmation) VOC samples analyzed at Great Lakes fixed-base laboratory.
6. Exceedances: **bold, box** = Concentration exceeds Soil Cleanup Objective

Table 1
Post-Remediation Soil Quality Results (GP-22 Area)
Former Crane Manufacturing - 6000 S. Buckhorn Avenue, Cudahy, Wisconsin
Sigma Project No. 8069

Soil Sample Location:		SW-6		SW-6R		SW-7			SW-7R		Soil Cleanup Objective[2]
Sample Depth (feet bgs):		2	8	2	8	2	8	---	2	8	
	Date:	02/16/04	02/16/04	02/20/04	02/20/04	02/16/04	02/16/04	---	02/20/04	02/20/04	
PAHs											
Acenaphthene	µg/kg	<112	<1,130	<109	3,120	<114	<1,060	---	2,040	1,350	38,000
Acenaphthylene	µg/kg	<223	<2,260	399	**1,650**	<228	<2,120	---	**2,530**	**1,880**	700
Anthracene	µg/kg	<112	8,670	340	12,200	<114	5,560	---	8,270	5,860	3,000,000
Benzo(a)anthracene	µg/kg	<55.8	13,900	1,420	**18,200**	164	14,000	---	14,400	11,300	17,000
Benzo(a)pyrene	µg/kg	17.9	6,490	1,220	8,570	131	8,480	---	5,840	4,570	48,000
Benzo(b)fluoranthene	µg/kg	<55.8	8,530	1,620	11,800	195	11,000	---	10,100	8,010	360,000
Benzo(ghi)perylene	µg/kg	<112	3,000	933	4,820	<114	4,450	---	4,210	3,380	6,800,000
Benzo(k)fluoranthene	µg/kg	<112	3,690	690	4,980	<114	4,370	---	4,020	3,400	870,000
Chrysene	µg/kg	<112	12,100	1,500	15,700	151	13,000	---	13,800	10,700	37,000
Dibenzo(a,h)anthracene	µg/kg	<5.58	<56.6	1,070	1,400	<5.71	5,450	---	599	3,690	38,000
Fluoranthene	µg/kg	<112	23,500	2,050	31,300	164	18,400	---	21,300	15,300	500,000
Fluorene	µg/kg	<112	4,720	<109	8,850	<114	1,710	---	4,670	3,490	100,000
Indeno(1,2,3-cd)pyrene	µg/kg	<55.8	3,590	1,100	5,900	125	5,630	---	4,610	3,930	680,000
1-Methylnaphthalene	µg/kg	<112	2,360	<109	5,290	<114	<1,060	---	3,200	2,550	23,000
2-Methylnaphthalene	µg/kg	<112	9,050	1,520	**23,700**	<114	<1,060	---	16,400	11,700	20,000
Naphthalene	µg/kg	<112	<1,130	<109	**2,210**	<114	<1,060	---	**3,470**	**2,510**	400
Phenanthrene	µg/kg	<112	**17,500**	913	**23,800**	<114	**10,200**	---	**14,700**	**10,500**	1,800
Pyrene	µg/kg	<112	13,000	1,160	14,100	126	11,100	---	11,000	10,100	8,700,000
Soil Sample Location:		SW-6		SW-6R		SW-7			SW-7R		Soil Cleanup Objective[2]
Sample Depth (feet bgs):		2	8	2	8	2	8	8	2	8	
	Date:	02/16/04	02/16/04	---	---	02/16/04	02/16/04	02/16/04	---	---	
CVOCs & Detected VOCs								Fixed lab			
Tetrachloroethene	µg/kg	<50	<50	NA	NA	<50	<50	<25.0	NA	NA	1,230
Trichloroethene	µg/kg	<50	<50	NA	NA	<50	<50	<25.0	NA	NA	850
cis-1,2-Dichloroethene	µg/kg	<50	<50	NA	NA	<50	<50	<25.0	NA	NA	156,000
trans-1,2-Dichloroethene	µg/kg	<50	<50	NA	NA	<50	<50	<25.0	NA	NA	313,000
Benzene	µg/kg	NA	NA	NA	NA	NA	NA	31.3	NA	NA	---
Toluene	µg/kg	NA	NA	NA	NA	NA	NA	188	NA	NA	---
Xylenes (total)	µg/kg	NA	NA	NA	NA	NA	NA	32.9	NA	NA	---
Naphthalene	µg/kg	NA	NA	NA	NA	NA	NA	1,040	NA	NA	---

Notes:
1. µg/kg = micrograms per kilogram (equivalent to parts per billion, ppb)
2. Soil Cleanup Objectives established in Sigma's November 20, 2003 letter report to WDNR:
   Cleanup Objectives for CVOCs based on lowest direct contact RCLs for non-industrial sites as presented in WDNR publication PUB-RR-682 "De
   Cleanup Objectives for PAHs based on migration to groundwater RCL as presented in WDNR publication RR-519-97 "*Soil Cleanup Levels for Pa*
3. --- = no cleanup object defined for remediation work
4. All PAH samples analyzed at Great Lakes Analytical fixed-base laboratory.
5. VOC samples analyzed by New Age/Landmark mobile laboratory in the field; duplicate (confirmation) VOC samples analyzed at Great Lakes fixed-b
6. Exceedances: **bold, box** = Concentration exceeds Soil Cleanup Objective

Table 1
Post-Remediation Soil Quality Results (GP-22 Area)
Former Crane Manufacturing - 6000 S. Buckhorn Avenue, Cudahy, Wisconsin
Sigma Project No. 8069

Soil Sample Location:		TP-1		TP-2		TP-3		TP-4		Soil Cleanup Objective[2]
Sample Depth (feet bgs):		2	8	2	8	2	8	2	8	
	Date:	02/26/04	02/26/04	02/26/04	02/26/04	02/26/04	02/26/04	02/26/04	02/26/04	
PAHs										
Acenaphthene	µg/kg	<109	12,100	<119	5,190	<118	<117	<117	<1,150	38,000
Acenaphthylene	µg/kg	<219	**10,200**	<238	**4,300**	<235	<234	<234	<2,300	700
Anthracene	µg/kg	<109	31,800	<119	11,600	<118	<117	150	<1,150	3,000,000
Benzo(a)anthracene	µg/kg	72.3	**31,300**	<59.6	**18,900**	159	154	238	1,050	17,000
Benzo(a)pyrene	µg/kg	66.9	17,000	22.4	9,480	116	123	173	1,580	48,000
Benzo(b)fluoranthene	µg/kg	80.2	18,600	<59.6	13,000	158	174	206	2,160	360,000
Benzo(ghi)perylene	µg/kg	<109	7,800	<119	8,260	129	139	132	2,160	6,800,000
Benzo(k)fluoranthene	µg/kg	<109	9,020	<119	5,640	<118	<117	<117	<1,150	870,000
Chrysene	µg/kg	<109	28,600	<119	14,700	156	156	203	1,250	37,000
Dibenzo(a,h)anthracene	µg/kg	<5.47	8,470	29.1	1,670	<5.88	<5.86	<5.84	1,760	38,000
Fluoranthene	µg/kg	140	66,200	<119	43,900	234	321	464	<1,150	500,000
Fluorene	µg/kg	<109	12,500	<119	4,190	<118	<117	<117	<1,150	100,000
Indeno(1,2,3-cd)pyrene	µg/kg	<54.7	6,790	<59.6	5,020	<110	139	139	2,030	680,000
1-Methylnaphthalene	µg/kg	<109	6,750	<119	2,510	<118	<117	133	<1,150	23,000
2-Methylnaphthalene	µg/kg	<109	<1,070	<119	12,700	<118	<117	148	<1,150	20,000
Naphthalene	µg/kg	<109	1,960	<119	<1,080	<118	<117	<117	<1,150	400
Phenanthrene	µg/kg	<109	**53,300**	<119	**25,200**	<118	189	355	<1,150	1,800
Pyrene	µg/kg	<109	38,700	<119	17,400	<118	129	175	<1,150	8,700,000
Soil Sample Location:		TP-1		TP-2		TP-3		TP-4		Soil Cleanup Objective[2]
Sample Depth (feet bgs):		2	8	2	8	2	8	2	8	
	Date:	---	---	---	---	---	---	---	---	
CVOCs & Detected VOCs										
Tetrachloroethene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	1,230
Trichloroethene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	850
cis-1,2-Dichloroethene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	156,000
trans-1,2-Dichloroethene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	313,000
Benzene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	---
Toluene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	---
Xylenes (total)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	---
Naphthalene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	---

Notes:
1. µg/kg = micrograms per kilogram (equivalent to parts per billion, ppb)
2. Soil Cleanup Objectives established in Sigma's November 20, 2003 letter report to WDNR:
   Cleanup Objectives for CVOCs based on lowest direct contact RCLs for non-industrial sites as presented in WDNR publication PUB-R
   Cleanup Objectives for PAHs based on migration to groundwater RCL as presented in WDNR publication RR-519-97 *"Soil Cleanup Le*
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4. All PAH samples analyzed at Great Lakes Analytical fixed-base laboratory.
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6. Exceedances: **bold, box** = Concentration exceeds Soil Cleanup Objective

Table 1
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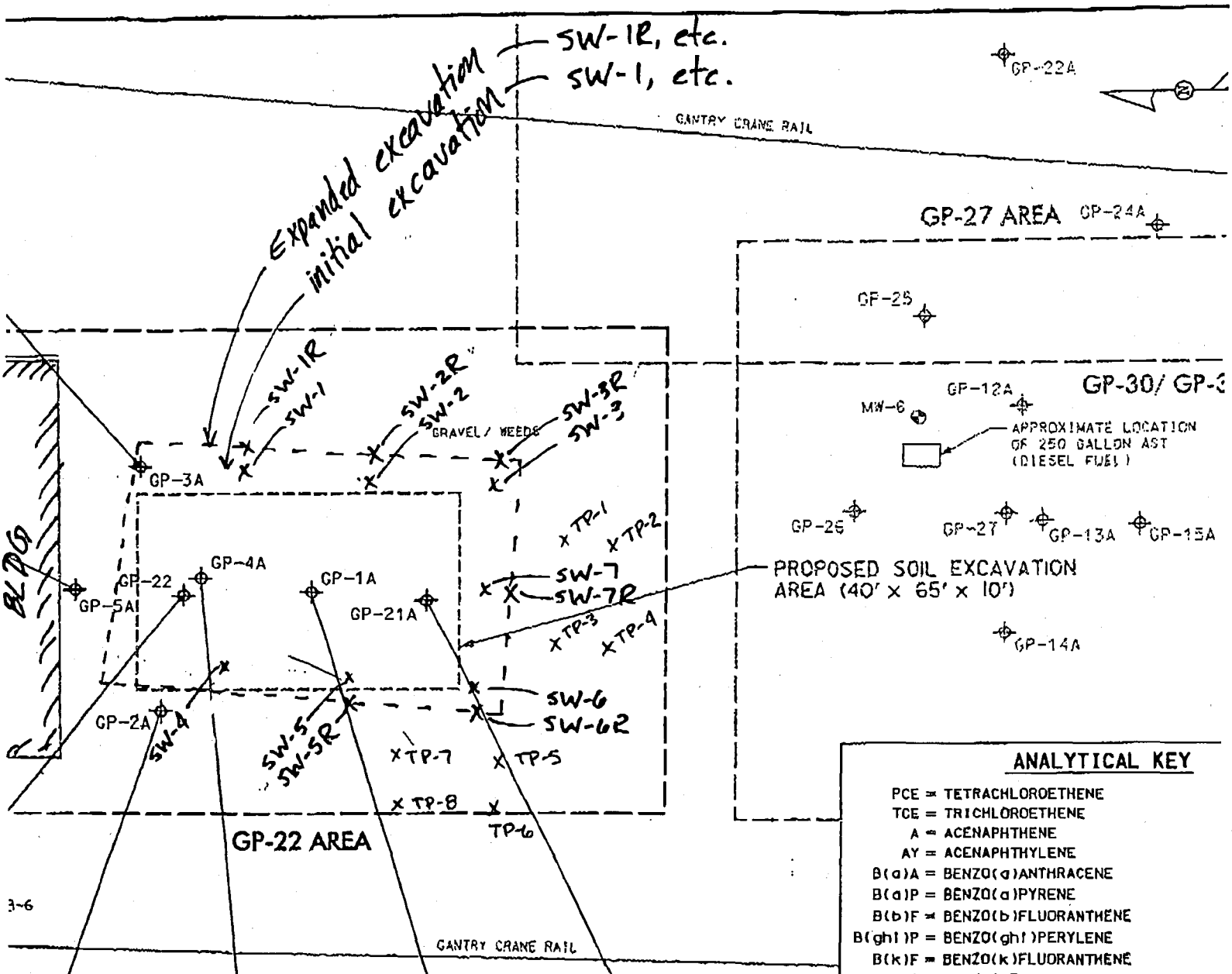
Former Crane Manufacturing - 6000 S. Buckhorn Avenue, Cudahy, Wisconsin
Sigma Project No. 8069

Soil Sample Location:		TP-5		TP-6		TP-7		TP-8		Soil Cleanup Objective[2]
Sample Depth (feet bgs):		2	8	2	8	2	8	2	8	
	Date:	02/26/04	02/26/04	02/26/04	02/26/04	02/26/04	02/26/04	02/26/04	02/26/04	
PAHs										
Acenaphthene	µg/kg	302	<113	<116	<116	6,740	1,550	<113	1,520	38,000
Acenaphthylene	µg/kg	<243	<225	<231	<233	<2,160	<2,280	<226	<2,180	700
Anthracene	µg/kg	348	<113	<116	<116	14,100	1,400	<113	1,710	3,000,000
Benzo(a)anthracene	µg/kg	1,030	232	<57.8	167	**21,800**	3,160	153	3,510	17,000
Benzo(a)pyrene	µg/kg	1,140	162	22.2	148	14,000	3,310	129	1,680	48,000
Benzo(b)fluoranthene	µg/kg	1,090	186	<57.8	211	14,400	4,550	119	2,440	360,000
Benzo(ghi)perylene	µg/kg	732	200	<116	181	6,550	3,000	187	1,190	6,800,000
Benzo(k)fluoranthene	µg/kg	481	<113	<116	<116	6,790	1,730	<113	<1,090	870,000
Chrysene	µg/kg	929	211	<116	120	14,300	3,190	<113	2,820	37,000
Dibenzo(a,h)anthracene	µg/kg	635	<5.63	<5.78	<5.82	7,380	2,970	<5.64	1,400	38,000
Fluoranthene	µg/kg	1,590	400	<116	<235	50,700	4,070	164	4,590	500,000
Fluorene	µg/kg	<122	<113	<116	<116	5,150	1,270	<113	<1,090	100,000
Indeno(1,2,3-cd)pyrene	µg/kg	630	125	<57.8	<164	6,450	3,030	139	1,200	680,000
1-Methylnaphthalene	µg/kg	<122	<113	<116	<116	16,500	<1,140	<113	<1,090	23,000
2-Methylnaphthalene	µg/kg	743	309	<116	<116	17,200	3,420	<113	1,580	20,000
Naphthalene	µg/kg	<122	<113	<116	<116	<1,080	<1,140	<113	<1,090	400
Phenanthrene	µg/kg	679	240	<116	<116	**42,100**	**3,470**	<113	**2,290**	1,800
Pyrene	µg/kg	756	224	<116	<116	13,700	2,230	181	2,570	8,700,000
Soil Sample Location:		TP-5		TP-6		TP-7		TP-8		Soil Cleanup Objective[2]
Sample Depth (feet bgs):		2	8	2	8	2	8	2	8	
	Date:	---	---	---	---	---	---	---	---	
CVOCs & Detected VOCs										
Tetrachloroethene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	1,230
Trichloroethene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	850
cis-1,2-Dichloroethene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	156,000
trans-1,2-Dichloroethene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	313,000
Benzene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	---
Toluene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	---
Xylenes (total)	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	---
Naphthalene	µg/kg	NA	NA	NA	NA	NA	NA	NA	NA	---

Notes:

1. µg/kg = micrograms per kilogram (equivalent to parts per billion, ppb)
2. Soil Cleanup Objectives established in Sigma's November 20, 2003 letter report to WDNR:
   Cleanup Objectives for CVOCs based on lowest direct contact RCLs for non-industrial sites as presented in WDNR publication PUB-R
   Cleanup Objectives for PAHs based on migration to groundwater RCL as presented in WDNR publication RR-519-97 *"Soil Cleanup Le*
3. --- = no cleanup object defined for remediation work
4. All PAH samples analyzed at Great Lakes Analytical fixed-base laboratory.
5. VOC samples analyzed by New Age/Landmark mobile laboratory in the field; duplicate (confirmation) VOC samples analyzed at Great Lal
6. Exceedances: **bold, box** = Concentration exceeds Soil Cleanup Objective



ANALYTICAL KEY

PCE = TETRACHLOROETHENE
TCE = TRICHLOROETHENE
A = ACENAPHTHENE
AY = ACENAPHTHYLENE
B(a)A = BENZO(a)ANTHRACENE
B(a)P = BENZO(a)PYRENE
B(b)F = BENZO(b)FLUORANTHENE
B(ghi)P = BENZO(ghi)PERYLENE
B(k)F = BENZO(k)FLUORANTHENE
C = CHRYSENE
D(ah)A = DIBENZO(a,h)ANTHRACENE
I(cd)P = INDENO(1,2,3-cd)PYRENE
2-M = 2-METHYLNAPHTHALENE
P = PHENANTHRENE
[ ] = EXCEEDS WDNR PAH INTERIM GUID. RCL FOR PROTECTION OF GROUND'
( ) = EXCEEDS WDNR PAH INTERIM GUID. RCL FOR DIRECT CONTACT (NON-
- ALL CONCENTRATIONS EXPRESSED IN MICR KILOGRAM (ug/kg).
- ALL DEPTH INTERVALS INCLUDED DUE TO SITE REDEVELOPMENT AND POTENTIAL SI

GP-2A

	2'-4'	10'-12'
	<25.0	<25.0
	<25.0	<25.0
	<5,290	<112
	<212	<223
	(1,370)	<55.9
	(1,440)	(17.6)
	(1,360)	<55.9
	824	<112
	585	<112
	1,480	<112
	(754)	(18.1)
	(1,030)	<55.9
	429	<112
	1,170	<112

GP-4A

DEPTH	2'-4'	12'-14'
PCE	<25.0	<25.0
TCE	659	<25.0
A	NS	641
AY	NS	<208
B(a)A	NS	(330)
B(a)P	NS	(546)
B(b)F	NS	(639)
B(ghi)P	NS	683
B(k)F	NS	274
C	NS	630
D(ah)A	NS	(630)
I(cd)P	NS	(808)
2-M	NS	427
P	NS	279

GP-1A

DEPTH	2'-4'	10'-12'
PCE	<25.0	<25.0
TCE	271	<25.0
A	[258,000]	<117
AY	[4,460]	<234
B(a)A	([66,500])	<58.5
B(a)P	(32,200)	(50.3)
B(b)F	(38,900)	59.0
B(ghi)P	(32,300)	<117
B(k)F	(23,500)	<117
C	([57,800])	<117
D(ah)A	(2,630)	<5.85
I(cd)P	(35,700)	115
2-M	[37,200]	<117
P	([196,000])	<117

GP-21A

DEPTH	2'-4'	6'-8'	10'-12'
PCE	NA	NA	NA
TCE	NA	NA	NA
A	<116	1,250	310
AY	<231	[1,010]	272
B(a)A	<57.8	(2,390)	(293)
B(a)P	(28.5)	(1,890)	(287)
B(b)F	<57.8	(2,390)	(241)
B(ghi)P	<116	1,580	142
B(k)F	<116	(908)	<111
C	<116	2,910	265
D(ah)A	<5.78	(1,280)	(135)
I(cd)P	<57.8	(1,420)	(144)
2-M	<116	380	185
P	<116	[3,010]	996

LEGEND

- = SIGMA GEOPROBE SOIL BORING LOCATION (2003)
- = SIGMA MONITORING WELL LOCATION (2003)
- = SIGMA PHASE II SOIL BORING LOCATION (MAY 2003)
- = NORTHERN PHASE II SOIL BORING LOCATION (1993)

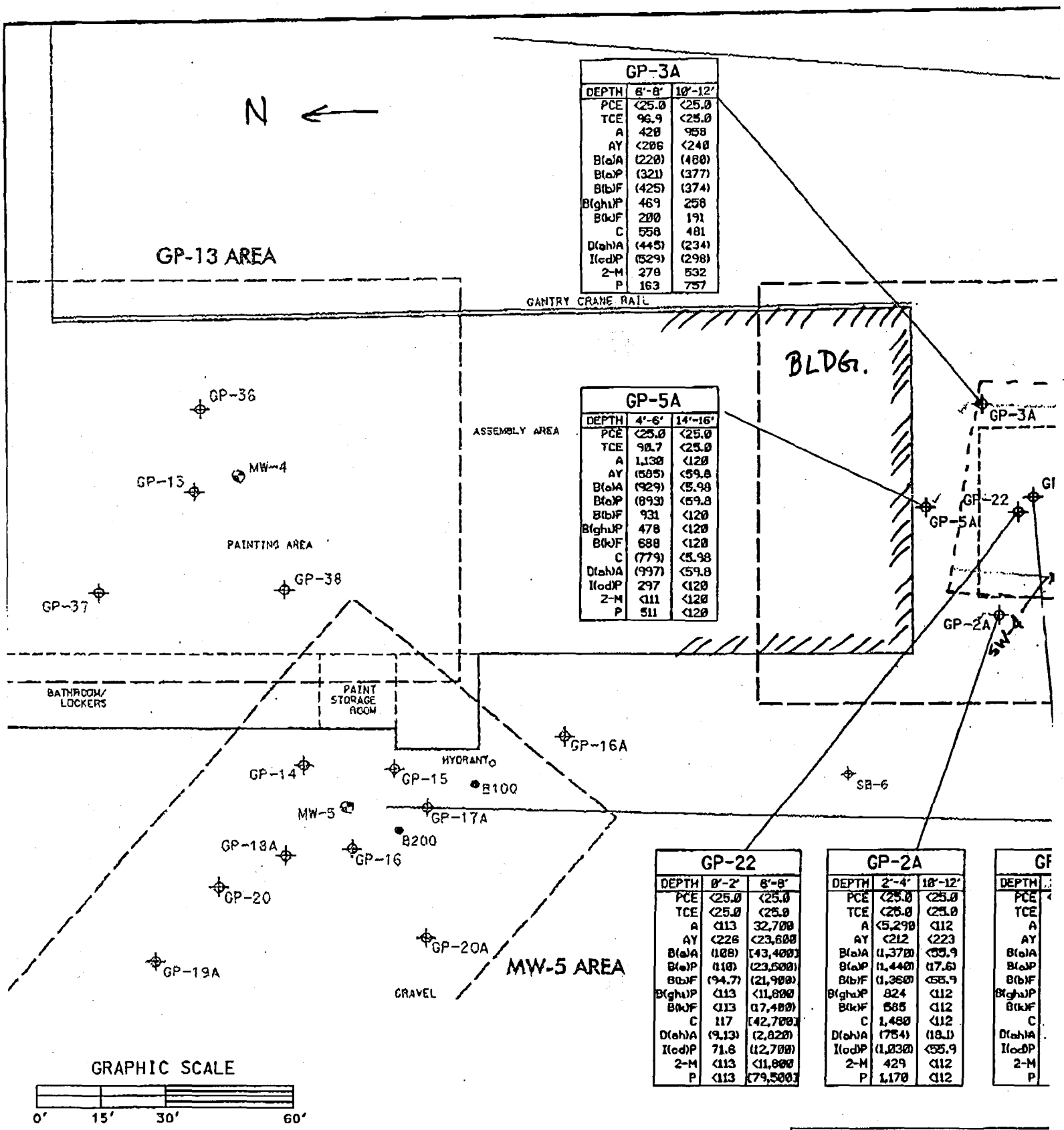
FORMER CRANE MANUFACTURING
6000 S. BUCKHORN AVE., CUDAHY, WI

SIGMA ENVIRONMENTAL

DATE: 11-6-03	DR. BY: BEB	DR.# 8069-020	SCALE: 1"

GP-22 INVESTIGATION AREA
SOIL QUALITY MAP

FIGU



GP-3A		
DEPTH	6'-8'	10'-12'
PCE	<25.0	<25.0
TCE	96.9	<25.0
A	420	958
AY	<206	<240
B(a)A	(220)	(460)
B(a)P	(321)	(377)
B(b)F	(425)	(374)
B(ghi)P	469	258
B(k)F	200	191
C	558	481
D(ah)A	(445)	(234)
I(cd)P	(529)	(298)
2-M	278	532
P	163	757

GP-5A		
DEPTH	4'-6'	14'-16'
PCE	<25.0	<25.0
TCE	98.7	<25.0
A	1,130	<120
AY	(585)	<59.8
B(a)A	(929)	<5.98
B(a)P	(893)	<59.8
B(b)F	931	<120
B(ghi)P	478	<120
B(k)F	688	<120
C	(779)	<5.98
D(ah)A	(997)	<59.8
I(cd)P	297	<120
2-M	<111	<120
P	511	<120

GP-22		
DEPTH	0'-2'	8'-8'
PCE	<25.0	<25.0
TCE	<25.0	<25.0
A	<113	32,700
AY	<226	<23,600
B(a)A	(108)	[43,400]
B(a)P	(110)	(23,500)
B(b)F	(94.7)	(21,900)
B(ghi)P	<113	<11,800
B(k)F	<113	(7,400)
C	117	[42,700]
D(ah)A	(9.13)	(2,820)
I(cd)P	71.8	(12,700)
2-M	<113	<11,800
P	<113	[79,500]

GP-2A		
DEPTH	2'-4'	10'-12'
PCE	<25.0	<25.0
TCE	<25.0	<25.0
A	<5,290	<112
AY	<212	<223
B(a)A	(1,370)	<55.9
B(a)P	(1,440)	(17.6)
B(b)F	(1,360)	<55.9
B(ghi)P	824	<112
B(k)F	585	<112
C	1,480	<112
D(ah)A	(764)	(18.1)
I(cd)P	(1,030)	<55.9
2-M	429	<112
P	1,170	<112

GP	
DEPTH	
PCE	
TCE	
A	
AY	
B(a)A	
B(a)P	
B(b)F	
B(ghi)P	
B(k)F	
C	
D(ah)A	
I(cd)P	
2-M	
P	

NOTES:
1. MAP BASED ON ENGINEERING DRAWING (DATED 5-18-94) PROVIDED BY CRANE MANUFACTURING & SERVICE CORP.; INTERIOR BUILDING NOTES BASED ON INFORMATION PROVIDED TO SIGMA BY BUILDING OWNER AND FIELD OBSERVATIONS.
2. NO INTERIOR FLOOR DRAINS OR EXTERIOR STORM SEWERS WERE OBSERVED ON SITE.
3. LOCATIONS OF SOIL BORINGS AND MONITORING WELLS BASED ON FIELD MEASUREMENTS.

LEG

MW, GP = SIGMA GEOPROBE SO
MW = SIGMA MONITORING
SB = SIGMA PHASE II SO
● = NORTHERN PHASE II