DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

2701 International Lane, Suite 210
Madison, Wisconsin 53704
608 244 1788 Tel
608 244 7823 Fax

Note! see last ¶, MW-4S & MW-4D PCE and

March 18, 1997

Mr. Pat McCutcheon
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711

RE: Results of Additional Soil and Groundwater Investigation
Madison-Kipp Corporation, Madison, Wisconsin

Dear Mr. McCutcheon:

Dames & Moore has completed additional soil and groundwater investigative activities at the Madison-Kipp Corporation (MKC) facility on Waubesa Street, Madison. Our tasks in 1996 included a review of historical information to identify likely contaminant sources, the installation of a well nest at the southern property boundary, the installation of an extraction well adjacent to well MW-1, the collection of Geoprobe soil samples at two locations, and performance of a short-term pumping test. Well construction and borehole abandonment documentation are provided in Attachment A.

Executive Summary

Several phases of site investigation have occurred at the MKC. The soil investigation has included hand-auger, Geoprobe and split spoon sampling. The site groundwater investigation has included Geoprobe, Hydropunch and monitor well sampling, in addition to the installation of a 6-inch extraction well, on which a short-duration aquifer performance test was subsequently conducted. In addition, the results of a historical review of site operations confirmed that the likely sources of contamination detected during the investigation were a former tetrachloroethene (PCE) storage tank and the vent of a former vapor degreaser, which used PCE.

Figure 1 shows the location of all sampling conducted to-date. As indicated on that figure, much of the investigative activities have been concentrated in the parking area at the northeast corner of the facility. Additional groundwater sampling to define the downgradient extent of impacted groundwater has been conducted toward the south.

Previously, investigation status reports were submitted to the Wisconsin Department of Natural Resources (WDNR) in December 1994, April 1995 and March 1996. Together, these documents summarized all work completed through August 1995. Additional site activities were completed in June and July of 1996, and described herein. This work included the installation of the extraction well, the installation of a downgradient well nest (wells MW-4S and MW-4D), and the collection of soil samples at Geoprobe sample locations GP-101 and GP-102. *

Near sources

This appears upgradient to me!

Tables 1, 2 and 3 summarize the results of head space analyses, soil analyses and groundwater analyses, respectively, for the entire site investigation. Based upon head space and soil analyses, we have identified soils impacted by PCE and associated compounds in two general locations, as shown on Figure 2. The first area (Area 1 on the figure) appears to be associated with a former PCE above ground storage tank. A drainage ditch formerly extended from a point near the tank to the north end of the building, where a pipe drained into a storm sewer. The second location (Area 2 on the figure) is adjacent to the location of a former vent from a vapor degreaser.

Tetrachloroethene has been detected in all site monitor wells; however, the concentrations in wells MW-4S and MW-4D are below the state's Enforcement Standard, indicating the approximate downgradient terminus of the plume.

Based upon the results of the investigation, this report makes the following recommendations:

Soil:
Additional Geoprobe soil sampling will be completed to fully delineate the areas of impacted soil. Initial samples will be collected in the locations shown on Figure 3. Because the drainage ditch discharged to the storm sewer, samples will also be collected along the sewer to determine if contaminants ever entered the sewer and leaked from it. Assuming that the delineated areas of impacted soil will be of a manageable size and depth, impacted soil will be excavated and disposed off site. Recommendations for site-specific Residual Contaminant Levels (RCLs) will be made subsequent to the completion of the additional soil sampling.

Groundwater:
The sources of the releases (the above ground PCE tank and the vapor degreaser vent) have been removed; however, the impacted soils in these areas are a potential source of contaminant loading to the water table. Upon completion of the soil remediation discussed above, and based upon historical information reviewed, no further source areas should remain at the site. Consequently, future reductions in groundwater contaminant concentrations are expected as a consequence of natural attenuation. We therefore recommend that the groundwater be monitored on a semi-annual basis for two years after the soil is remediated. If no improvement in groundwater quality occurs by the end of that time, or if sampling indicates that contaminants in excess of the state's ES are leaving the downgradient property line (as indicated by samples collected from MW-4S and MW-4D), an active groundwater remediation system may be designed, installed and implemented. Based upon our research into feasible alternatives, we anticipate that this would be an ozone sparge system (see Attachment B).

What was this historical info.?

How is this known? Have other areas been tested?

No further source areas? what?

Mr. Pat McCutcheon
Wisconsin Department of Natural Resources
March 18, 1997
Page 3

Soil Sampling

In addition to all prior soil sample analyses (see Tables 1-A through 1-L and Tables 2-A and 2-B), soil samples were collected from the EW-1 and MW-4 boring locations (June 1996), and from Geoprobe locations GP-101 and GP-102 (July 1996). Samples were selected for laboratory analyses for VOCs based upon head space screening using a photoionization detector (the sample collected from above the water table from each location which yielded the highest head space concentration was selected for analyses). Table 2-C presents the results from these analyses; laboratory reports are in Attachment C. In addition to VOCs, pH and total organic carbon (TOC) were analyzed in the samples collected from MW-4, EW-1 and GP-102. Organic carbon content and pH are used as indicators for the potential application of bioremediation, and as a parameter used in the assessment of the potential retardation of contaminant migration. The sample analyzed from Geoprobe sample location GP-101 was analyzed for DRO to assess the potential for fuel oil to have been released at that location. This location was selected because it was the point of fill for an above ground fuel oil tank, formerly located immediately inside the building.

Sample GP-101 was non-detect for all parameters (the laboratory report indicated a detect of methylene chloride; however, this is considered to be a laboratory contaminant). Similarly, the soil sample analyzed from the MW-4 location was non-detect for all parameters. The sample collected from boring EW-1 yielded 150 mg/kg of tetrachloroethene. Although the samples collected from MW-4 and GP-102 contained detectable concentrations of TOC, no organic carbon was detected in the sample collected from EW-1. This is likely due to the soil at that location being fill material, covered with asphalt. Sample GP-102 yielded significant concentrations of several chlorinated compounds, including PCE (4,000 µg/kg), trichloroethene (TCE -- 7,500 µg/kg), and cis-1,2-dichloroethene (6,300 µg/kg). This location is near the former vent for a vapor degreaser, which is considered the source of the detected contaminants. It also represents the highest concentrations of chlorinated VOCs found to date in the soil at the site, and is considered a likely source location for groundwater contaminants due to the measured concentrations. It is also a likely source location because the area is unpaved, permitting infiltrating precipitation and melting snow to transport contaminants. However, based upon groundwater concentrations detected in samples from well MW-3 (upgradient from GP-102), it is also our opinion that another source is located north of location GP-102. This potential source area is addressed in our work plan for additional soil sampling.

Groundwater Sampling

Wells MW-4, MW-4A and EW-1 were installed in June 1996. The new wells were developed and the two new monitor wells (MW-4 and MW-4A) were sampled, along with the previously existing site monitor wells. The samples were analyzed for volatile organic compounds (VOCs) and diesel range organics (DRO). The results of these analyses are presented in Table 3-D; laboratory reports

and c. 150 feet from almost directly west of 158 S. Marquette St. (my house)

are included in Attachment C. As the table shows, the highest concentrations occur in the vicinity of well MW-3. Contaminant concentrations at wells MW-2S and MW-2D (downgradient from MW-3) are reduced; however, the higher concentrations in that well nest occur at depth, in well MW-2D. These data are consistent with those collected in the 1995 phase of the investigation. The MW-4 well nest, which was installed in June 1996 at the downgradient perimeter of the property, yielded contaminants (PCE) at concentrations in excess of the Preventive Action Limit (PAL), but below the ES.

Figure 4 shows the water table as measured in August 1996. As the figure shows, groundwater flow, based upon these data, is to the south-southeast. Previous water level measurements indicated a south-southwesterly flow direction. The variation between the previous flow understanding and those developed from the August data may be a result of the additional data point (MW-4S), or it may be indicative of temporal variations in flow conditions. The previous groundwater sampling conducted at the Madison Brass site suggest that a westerly component of flow is present, at least at times.

Undue speculation?

A short-term pumping test was conducted on well EW-1 on July 26, 1996. The well was pumped at an average rate of 0.94 gallons per minute. The results of the analyses of the data collected from this test are provided in Attachment D. Based upon these results, we estimate the hydraulic conductivity of the overburden aquifer to be approximately 0.6 feet/day.

Summary and Work Plan

so they designed the ditch to flow north?

Soil:

Two areas of impacted soil have been identified which are the likely sources for contaminants. These include the north (downgradient) end of a former drainage ditch, which terminated adjacent to the northeast corner of the building, as shown on Figure 2. The second area is the soil beneath the former vapor degreaser vent, also shown on Figure 2. Because of the potential flow of contaminants from a former above ground PCE tank to the storm sewer, it is our opinion that the route of the storm sewer may also be a source area.

Groundwater:

The approximate extent of impacted groundwater has been identified. Although the eastern extent of contamination has not been defined, the groundwater flow direction is predominantly to the south. Consequently, it is our opinion that the plume is not likely to extend a greater distance to the east than it has spread to the west, as defined by the concentration gradient between the MW-2 well nest and MW-3, which shows an order-of-magnitude decrease in concentrations.

What? + how far west has it gone — do they even know?

Work Plan:

Based upon the above discussion, MKC intends to conduct additional sampling along the storm sewer route, to determine if this is also a source area. A Geoprobe will be mobilized to sample soils to define the full horizontal and vertical extent of impacted soils. Initial samples will be collected in the general locations shown on Figure 2. Samples will also be collected in the area of the former vapor degreaser vent and at the north end of the former ditch to define the extent of impacted soils in those areas. Samples will also be collected adjacent to the storm sewer to assess the potential for additional impacted soils.

Samples will be field screened. Based upon the screening results, samples will be selected for confirmatory analyses at a WDNR-certified environmental laboratory. Samples will be analyzed for VOCs, TOC and grain size. After sample analyses have been completed, site-specific RCLs will be established in accordance with Wisconsin Administrative Code ch. NR 720.19.

Upon the completion of source area identification, impacted soils will be remediated. Because the impacted soils do not at this time appear wide-spread, but rather appear concentrated in two areas, it is likely that the most cost-effective approach will be "hot spot" remediation, such as excavation and disposal. This will, however, be dependent upon the final delineation of impacted areas, and upon accessibility of equipment for excavation. Several options are summarized and compared in Attachment B of this document.

MKC will monitor groundwater concentrations on a semi-annual basis for 2 years, beginning at the time of soil remediation. At the end of this 2-year period, the status of the groundwater quality, and the impacts resulting from the removal of impacted soils will be evaluated. At that time, we anticipate one of three possible courses of action:

1. Groundwater quality will be appropriate for a recommendation for site closure.
2. Groundwater quality will show an improvement, but not to the point of closure. In this event continued monitoring will be recommended.
3. Groundwater quality does not improve. This could result in recommendations for the design, construction and implementation of an active remediation system.

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

Upon your review of this letter, please provide us with your questions and comments. Alternatively, we will proceed with the work plan described above.

Sincerely,
DAMES & MOORE

Robert J. Nauta, P.G.
Senior Hydrogeologist

David P. Trainor, P.E., P.G.
Project Director

rjn\ltr\mccu0318.ltr

TABLE 1-A
HEAD SPACE ANALYSES - HAND AUGER SAMPLES
October 1994

PARAMETERS	HA-1			HA-2			HA-3		
	Depth (Feet)			Depth (Feet)			Depth (Feet)		
	0.5	1.5	3.0	0.5	1.5	3.0	0.5	1.5	3.3
Tetrachloroethene	X	X	X	X	X	X			
Trichloroethene		X	X						
Ethylbenzene	X		X		X	X	X	X	X
Toluene		X	X						
1,2-Dichloroethene		X	X						
Vinyl chloride	X	X	X	X	X	X	X	X	X
1,1,2,2-Tetrachloroethane	X		X					X	

Note: X denotes the presence of this compound in the head space sample.

TABLE 1-B
HEAD SPACE ANALYSES - SOIL BORING SB-1
January 1995
All concentrations in µg/L of head space gas

	PARAMETERS	DEPTH IN FEET								
		2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20
.7 mg/L	Tetrachloroethene	438	245	177	218	113	96.9		261	301
.5mg/L	Trichloroethene	209		23		79.3	17.3	17.8	13.2	11.8
	Ethylbenzene	32		10.8				12.5		
	Toluene		4.2	8.3	8.5	23.5	22	5.6	3.9	10.6
.5mg/L	1,2-Dichloroethene	160	58		7.8	6.8				
.2 mg/L	Vinyl chloride		129	1,268	440		469	481	419	291

c/kipp/analytic.tbl

TABLE 1-C
HEAD SPACE ANALYSES - SOIL BORING SB-2
January 1995
All concentrations in µg/L of head space gas

PARAMETER	DEPTH IN FEET							
	2-4	4-6	6-8	8-10	10-12	12-14	14-16	18-20
Tetrachloroethene	69.5		6.6	11.5	258.6	984	974	1,674
Trichloroethene	182	117	26.8			181		
Toluene					27.7	11.4	6.5	5.6
1,2-Dichloroethene	153	28.1	119	224	570	116	197	273
Vinyl chloride	48							

.5 mg/L
.2 mg/L

TABLE 1-D
HEAD SPACE ANALYSES - SOIL BORING SB-3
January 1995
All concentrations in µg/L of head space gas

PARAMETER	DEPTH IN FEET						
	4-6	6-8	8-10	10-12	12-14	14-16	16-18
Tetrachloroethene	7,540	987	1,754	3,629	1,380	4,057	6,456
Trichloroethene				3,933			
Toluene		20.9	9.6	9.9		25.2	13.9
1,2-Dichloroethene	2,668	3,665	2,557	6,422	1,927	4,523	10,280
Vinyl chloride		42.2	120	99.3	308		63.7

.5 mg/L
.2 mg/L

c/kipp/analytic.tbl

SB-4 is c. 170 ft [illegible] house (138 S. Hang.)

TABLE 1-E
HEAD SPACE ANALYSES - SOIL BORING SB-4
January 1995
All concentrations in µg/L of head space gas

	PARAMETER	DEPTH IN FEET						
		6-8	8-10	10-12	12-14	14-16	16-18	18-20
	Tetrachloroethene	1,405		400	291			
.5 mg/L	Trichloroethene		638	14.1				
	Ethylbenzene	17.8		5,829	3,636	596	70.2	10.3
	Toluene	50	18,590	277	62.7	5.1	9.3	
.5 mg/L	1,2-Dichloroethene	572	179			6,785	4,095	885
	1,1,1 Trichloroethane	105,300	83,520			1,268	474	198
.2 is safe level!!!	Vinyl chloride	593	2,265	186	447	214	148	284

1100 times safe level

TABLE 1-F
HEAD SPACE ANALYSES - SOIL BORING SB-5
January 1995
All concentrations in µg/L of head space gas

	PARAMETER	DEPTH IN FEET		
		0-8	8-10	10-12
	Tetrachloroethene			
.5 mg/L	Trichloroethene	57.6		
	Ethylbenzene		141	114
	Toluene	3,229	9.0	
.5 mg/L	1,2-Dichloroethene	3,735	1,070	139
	1,1,1 Trichloroethane	147	58,200	2,214
.2 mg/L	Vinyl chloride	522	109	129

SB-5 to west of storm-sewer ditch, so unreflective of runoff (most direction runoff would draw into that ditch)?

c/kipp/analytic.tbl

TABLE 1-G
HEAD SPACE ANALYSES - GP-1
June 1995
All concentrations in µg/L of head space gas

PARAMETER	DEPTH IN FEET						
	1-3	4-6	7-9	10-12	13-15	16-18	19-21
.5mg/L 1,2-Dichloroethene	3						
Tetrachloroethane	53	47	50	42	106	107	53
1,1,1-Trichloroethane	1	1	1	0.5	1	1	1
Trichloroethene	66	23	7	4	4	3	30

TABLE 1-H
HEAD SPACE ANALYSES - GP-2
June 1995
All concentrations in µg/L of head space gas

PARAMETER	DEPTH IN FEET						
	1-3	4-6	7-9	10-12	13-15	16-18	19-21
.5mg/L 1,2-Dichloroethene							
Tetrachloroethane	51	67	85	94	42	62	80
1,1,1-Trichloroethane	1						
Trichloroethene	28	2	2			1	1

TABLE 1-I
HEAD SPACE ANALYSES - GP-3
June 1995
All concentrations in µg/L of head space gas

PARAMETER	DEPTH IN FEET						
	1-3	4-6	7-9	10-12	13-15	16-18	19-21
1,2-Dichloroethene							
Tetrachloroethane	103	89	58	81	82	100	97
1,1,1-Trichloroethane							1
Trichloroethene	20	6	2	4	4	10	43

TABLE 1-J
HEAD SPACE ANALYSES - GP-4
June 1995
All concentrations in µg/L of head space gas

PARAMETER	DEPTH IN FEET				
	1-3	5-7	9-11	13-15	17-19
1,2-Dichloroethene					
Tetrachloroethane	54	70	71	58	48
1,1,1-Trichloroethane					
Trichloroethene	42	1	2	1	18

TABLE 1-K
HEAD SPACE ANALYSES - GP-5
June 1995
All concentrations in µg/L of head space gas

PARAMETER	DEPTH IN FEET				
	1-3	5-7	9-11	13-15	17-19
1,2-Dichloroethene					
Tetrachloroethane	76	100	105	84	50
1,1,1-Trichloroethane					
Trichloroethene	4	19	12	7	33

TABLE 1-L
HEAD SPACE ANALYSES - GP-6, GP-7 & GP-8
June 1995
All concentrations in µg/L of head space gas

PARAMETER	SAMPLE LOCATION AND DEPTH IN FEET						
	GP-6 20-22	GP-7 20-22	GP-8 1-3	GP-8 5-7	GP-8 9-11	GP-8 13-15	GP-8 17-19
1,2-Dichloroethene							
Tetrachloroethane	51	8	102	78	70	80	95
1,1,1-Trichloroethane							
Trichloroethene	6		6	1	1	2	6

TABLE 2-A
SUMMARY OF SOIL SAMPLE ANALYSES - SOIL BORINGS
January 1995
All concentrations in µg/kg

PARAMETERS	SAMPLE LOCATION AND DEPTH (ft.)				
	SB-1 6-8	SB-2 14-16	SB-3 14-16	SB-4 14-16	SB-5 10-12
n-Butylbenzene	ND	ND	ND	1.3	ND
sec-Butylbenzene	ND	ND	1.2	ND	ND
cis-1,2 Dichloroethene	ND	1.4	3.1	ND	ND
p-Isopropyltoluene	ND	ND	1.1	ND	ND
Methylene Chloride	1.6	2.8	1.5	1.9	24
Tetrachloroethene	5.5	1.5	46	7.0	9.9
Trichloroethene	ND	ND	9.1	3.8	ND
1,2,4-Trimethylbenzene	ND	ND	1.2	ND	ND

ND - Not detected.

TABLE 2-B
RESULTS OF SOIL ANALYSES - GEOPROBE SAMPLES
June 1995
All concentrations in µg/L

PARAMETER	SAMPLE LOCATION & DEPTH (ft)		
	GP-4 1 - 3 ft.	GP-5 1 - 3 ft.	GP-6 20 - 22 ft.
Tetrachloroethene	300	79	18
Toluene	2.9	ND	ND
Trichloroethene	26	5.5	ND

ND - Not detected.

c/kipp/analytic.tbl

TABLE 2-C
SOIL ANALYSES - SOIL BORING SAMPLES MW-4 & EW-1 (June 1996)
GEOPROBE SAMPLES GP-101 & GP-102 (July 1996)
All concentrations in µg/kg except as noted

PARAMETER	SAMPLE LOCATION AND DEPTH (ft.)			
	MW-4 9 - 11	EW-1 12.5 - 14.5	GP-101 4 - 6	GP-102 6 - 8
pH (Std. units)	8.42	8.32	NA	6.9
Total organic carbon (mg/kg)	410	<400	NA	880
cis-1,2-Dichloroethene	ND	ND	ND	6300
trans-1,2-Dichloroethene	ND	ND	ND	96
Methylene chloride[1]	180	160	1100	1000
Tetrachloroethene	ND	150	ND	4000
Trichloroethene	ND	ND	ND	7,500

15 to 5000 times safe level?

ND - Not detected.
NA - Not analyzed.
[1] Laboratory contaminant. (In above quantity ??)
[2] Diesel range organics and polynuclear aromatic hydrocarbons were also analyzed in sample GP-101; however, none were detected.
Residual contaminant levels not yet established for detected compounds.

c/kipp/analytic.tbl

TABLE 3-A
GEOPROBE GROUNDWATER SAMPLE ANALYSES
September 1994
All concentrations in µg/L

PARAMETER	MK-2	MK-3	MK-6	PAL	ES
sec-Butylbenzene	14	ND	ND	NE	NE
cis-1,2 Dichloroethene	2,200	ND	ND	7	70
trans-1,2 Dichloroethene	28	ND	ND	20	100
Isopropylbenzene	12	ND	ND	NE	NE
Tetrachloroethene	860	ND	1.8	0.5	5
Toluene	ND	4.6	ND	68.6	343
Trichloroethene	470	ND	ND	0.5	5
1,2,4-Trimethylbenzene	27	ND	ND	NE	NE
1,3,5-Trimethylbenzene	18	ND	ND	NE	NE
Vinyl Chloride	400	ND	ND	0.02	0.2

??

ND - Not detected.
NE - E.S. and P.A.L. not established.
Concentrations exceeding the ES have been shaded.

c/kipp/analytic.tbl

TABLE 3-C
GROUNDWATER SAMPLE ANALYSES
August 1995
All concentrations in µg/L

PARAMETER	MW-1	MW-2	MW-2A	MW-3	ES	PAL
Benzene	0.14	ND	0.047	2.7	5	0.5
Chloroethane	1.5	ND	ND	ND	400	80
Chloroform	ND	4.1	ND	0.42	6	0.6
Chloromethane	0.065	4.9	0.11	ND	NE	NE
1,1,-Dichloroethene	1.3	ND	ND	0.11	7	0.7
cis-1,2-Dichloroethene	87	3.6	0.11	89	70	7
trans-1,2-Dichloroethene	ND	ND	ND	3.9	100	20
Ethylbenzene	3.4	ND	0.049	0.054	700	140
Methylene chloride	ND	ND	0.031	0.032	150	15
1,1,1,2-Tetrachloroethane	0.028	ND	ND	0.053	NE	NE
Tetrachloroethene	140	1100	90	2600	5	0.5
Toluene	0.028	ND	0.14	0.26	343	68.6
1,1,2-Trichloroethane	ND	ND	ND	0.057	0.6	0.06
Trichloroethene	79	8.4	0.32	94	5	0.5
1,2,4-Trimethylbenzene	ND	ND	0.041	0.04	NE	NE
Vinyl chloride	11	ND	ND	1.7	0.2	0.02
Xylenes	ND	ND	0.053	0.072	620	124

More than 5,000 times the safe level.

ND - Not detected.
NE - E.S. and P.A.L. not established.
Concentrations exceeding the ES have been shaded.

c/kipp/analytic.tbl

TABLE 3-D
GROUNDWATER ANALYSES
June 1996
Concentrations in µg/L except as noted

PARAMETER	MW-1	MW-2S	MW-2D	MW-3	MW-4S	MW-4D	PAL	ES
Benzene	ND	ND	ND	1.4	ND	ND	0.5	5
Chloroform	ND	ND	ND	1.0	ND	ND	0.6	6
cis-1,2-Dichloroethene	80	ND	ND	ND	ND	ND	7	70
trans-1,2-Dichloroethene	2.1	ND	ND	4. 8	ND	ND	20	100
Methylene chloride[1]	ND	ND	10	ND	ND	ND	15	150
Tetrachloroethene	95	55	940	2000	1.3	2.1	0.5	5
Trichloroethene	61	ND	5.8	130	ND	ND	0.5	5
Diesel range organics (mg/L)[2]	0.13	N.D.	0.13	N.D.	N.D.	N.D.	NE	NE

ND - Non-detect.
NE - E.S. and P.A.L. not established.
Concentrations exceeding the ES have been shaded.
E.S. - Enforcement Standard.
[1] Laboratory contaminant.
[2] Polynuclear aromatic hydrocarbons were also analyzed; however, none were detected.

c/kipp/analytic.tbl

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMENT

Form 3300-5B
Rev. 3-94

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location: GP-10

County: Dane

NE 1/4 of SW 1/4 of Sec. 5 ; T. 7 N; R. 10 [X] E [ ] W

(If applicable) Gov't Lot _____ Grid Number _____

Grid Location _____ ft. [ ] N. [ ] S., _____ ft. [ ] E. [ ] W.

Civil Town Name: Town of Burke

Street Address of Well: 201 Waubesa Street

City, Village: Madison, WI 53704

(2) FACILITY NAME

Original Well Owner (If Known): Madison-Kipp Corporation

Present Well Owner: same

Street or Route: 201 Waubesa Street

City, State, Zip Code: Madison WI 53704

Facility Well No. and/or Name (If Applicable): GP-102

WI Unique Well No.: ____

Reason For Abandonment: Soil boring only

Date of Abandonment: 7/8/96

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 7/8/96

[ ] Monitoring Well
[ ] ~~Water Well~~
[ ] Drillhole
[X] Borehole

Construction Report Available? [ ] Yes [ ] No

Construction Type:
[ ] Drilled [ ] Driven (Sandpoint) [ ] Dug
[X] Other (Specify) geoprobe

Formation Type:
[X] Unconsolidated Formation [ ] Bedrock

Total Well Depth (ft.) 16.0 (From groundsurface) Casing Diameter (in.) ____ Casing Depth (ft.) ____

~~Lower Drillhole Diameter (in.)~~ ____

Was Well Annular Space Grouted? [ ] Yes [X] No [ ] Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) N/A

Pump & Piping Removed? [ ] Yes [ ] No [X] Not Applic
Liner(s) Removed? [ ] Yes [ ] No [X] Not Applic
Screen Removed? [ ] Yes [ ] No [X] Not Applic
Casing Left in Place? [ ] Yes [ ] No
If No, Explain _____

Was Casing Cut Off Below Surface? [ ] Yes [X] No
Did Sealing Material Rise to Surface? [X] Yes [ ] No
Did Material Settle After 24 Hours? [ ] Yes [X] No
If Yes, Was Hole Retopped? [ ] Yes [ ] No

(5) Required Method of Placing Sealing Material
[ ] Conductor Pipe-Gravity [ ] Conductor Pipe-Pumped
[ ] Dump Bailer [X] Other (Explain) gravity

(6) Sealing Materials
[ ] Neat Cement Grout
[ ] Sand-Cement (Concrete) Grout
[ ] Concrete
[ ] Clay-Sand Slurry
[ ] Bentonite-Sand Slurry
[ ] Chipped Bentonite

For monitoring wells and monitoring well boreholes
[ ] Bentonite Pellets
[X] Granular Bentonite
[ ] Bentonite - Cement Gro

(7) Material Used To Fill Well/Drillhole	From (FL)	To (FL)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Granular Bentonite	Surface	16.0	1 3/5 gal.	

(8) Comments: _____

(9) Name of Person or Firm Doing Sealing Work: Dames & Moore

Signature of Person Doing Work: Kirk Hulbert

Date Signed: 7/8/96

Street or Route: 2701 International Dr

Telephone Number: (608) 244-1788

City, State, Zip Code: Madison WI 53704

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected	District/County
Reviewer/Inspector	[ ] Complying Work [ ] Noncomplying W
Follow-up Necessary	

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☒ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Superfund ☐ Other _____

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Madison-Kipp Corporation	— — — — — — — —	GP-102

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
On-Site Environmental Dennis Totacki	07/08/96 (M M D D Y Y)	07/08/96 (M M D D Y Y)	Geoprobe

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
— — — — —	— — — — — — — — — —	GP-102	_____ Feet MSL	_____ Feet MSL	2" inches

Boring Location
State Plane _____ N. _____ E S/C/N
NE 1/4 of SW 1/4 of Section 5, T 7 N, R 10 (E) W
Lat ___ ° ___ ' ___ "
Long ___ ° ___ ' ___ "
Local Grid Location (If applicable)
_____ Feet ☐ N ☐ S _____ Feet ☐ E ☐ W

County	DNR County Code	Civil Town/City/ or Village
Dane	13	Town of Burke

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1			2.0	CLAY, little silt, moderately plastic, moist, medium-dark brown	CL			4.1						
2				trace sand and gravel				32.4						
			5.0											
3								68.8						
4								14.6						
5			10					7.9						
				SILT, little sand, trace gravel, non-plastic, moist, lt. tan	ML									
6								3.8						

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Kirk Hackbart
Firm: Dames & Moore

Sample Number	Sample Length Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
7			15	color darkens to brown	ML			8.0						
				16.0 E.O.B. Abandoned with 1 3/8 gal. bentonite.										

State of Wisconsin
Department of Natural Resources

WELL/DRILLHOLE/BOREHOLE ABANDONMEN

Form 3300-5B Rev. 3-94

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location: GP-10

County: Dane

NE 1/4 of SW 1/4 of Sec. 5 ; T. 7 N; R. 10 ☒ E ☐ W

(If applicable) Gov't Lot _____ Grid Number _____

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name: Town of Burke

Street Address of Well: 201 Waubesa Street

City, Village: Madison, WI 53704

(2) FACILITY NAME

Original Well Owner (If Known): Madison-Kipp Corporation

Present Well Owner: same

Street or Route: 201 Waubesa Street

City, State, Zip Code: Madison WI 53704

Facility Well No. and/or Name (If Applicable): GP-101

WI Unique Well No.: ----

Reason For Abandonment: Soil boring only

Date of Abandonment: 7/8/96

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) 7/8/96

☐ Monitoring Well
☐ Water Well
☐ Drillhole
☒ Borehole

Construction Report Available? ☐ Yes ☐ No

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (Specify) geoprobe

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 16.0 (From groundsurface) Casing Diameter (in.) ____ Casing Depth (ft.) ____

Lower Drillhole Diameter (in.) ____

Was Well Annular Space Grouted? ☐ Yes ☒ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) N/A

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applica
Liner(s) Removed?	☐ Yes	☐ No	☒ Not Applica
Screen Removed?	☐ Yes	☐ No	☒ Not Applica
Casing Left in Place?	☐ Yes	☐ No	

If No, Explain _____

Was Casing Cut Off Below Surface?	☐ Yes	☒ No
Did Sealing Material Rise to Surface?	☒ Yes	☐ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain) gravity

(6) Sealing Materials
☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes o
☐ Bentonite Pellets
☒ Granular Bentonite
☐ Bentonite - Cement Grou

(7) Material Used To Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume (Circle One)	Mix Ratio or Mud Weight
Granular Bentonite	Surface	16.0	1 3/8 gal.	

(8) Comments: _____

(9) Name of Person or Firm Doing Sealing Work: Dames & Moore

Signature of Person Doing Work: [signature] Date Signed: 7/8/96

Street or Route: 2701 International Dr. Telephone Number: (608) 244-1788

City, State, Zip Code: Madison, WI 53704

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected	District/County
Reviewer/Inspector	☐ Complying Work ☐ Noncomplying Wor
Follow-up Necessary	

Sample Number	Sample Length Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
7					ML		5.7							
			15.0											
				E.O.B. @ 16.0. Abandoned with 1 3/8 gal. of bentonite										

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☒ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Superfund ☐ Other _____

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 5-92

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Madison-Kipp Corporation	_ _ _ _ _ _ _	GP-101

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
On-Site Environmental Dennis Totecki	07/08/96 (M M D D Y Y)	07/08/96 (M M D D Y Y)	Geoprobe

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
_ _ _ _	_ _ _ _ _ _ _ _	GP-101	_____ Feet MSL	_____ Feet MSL	2" inches

Boring Location
State Plane _____ N, _____ E S/C/N
NE 1/4 of SW 1/4 of Section 5, T 7 N, R 10 (E)W
Lat ___ ° ___ ' ___ "
Long ___ ° ___ ' ___ "
Local Grid Location (If applicable) ☐ N ☐ E _____ Feet ☐ S _____ Feet ☐ W

County	DNR County Code	Civil Town/City/ or Village
Dane	13	Town of Burke

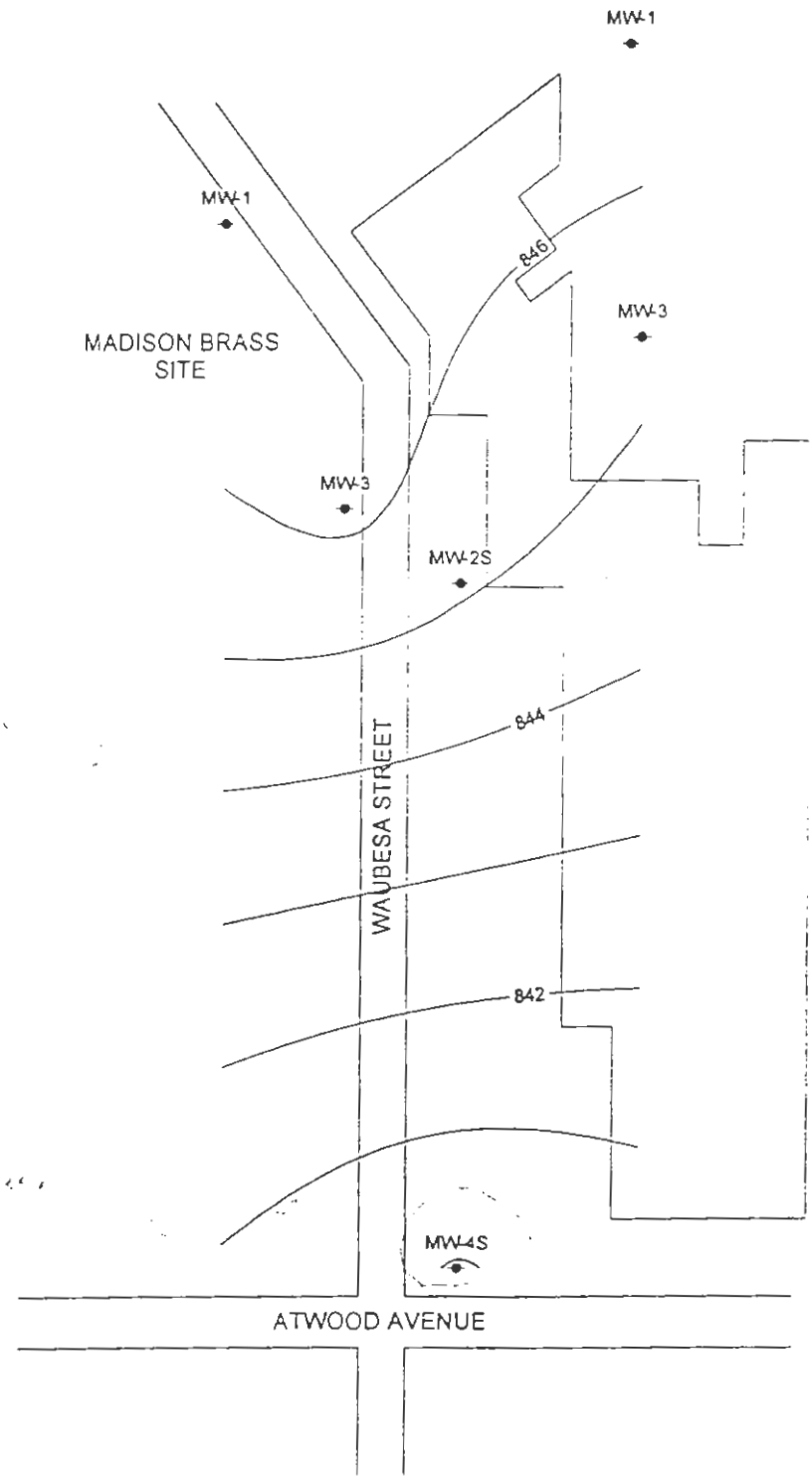
Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1			2.0	Fill, SAND, fine grained, some silt, trace gravel, poorly graded, light tan to black, some cinders				5.7						
2			5.0	CLAY, some silt, trace sand, trace gravel, low plasticity, moist, medium brown.	CL			5.4						
3								4.8						
4								3.7						
5			10.0	SILT, trace clay, little sand, trace gravel, non-plastic, moist, light brown.	ML			4.8						
6								4.6						

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature [signature] Firm Dames & Moore

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

ATTACHMENT A
BORING ABANDONMENT AND
WELL CONSTRUCTION DOCUMENTATION



842 GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL

SCALE IN FEET

0 100 200 300 400

NORTH

MADISON-KIPP CORPORATION

MADISON, WISCONSIN

FIGURE 4
WATER TABLE: AUGUST 1996

DCM GROUP DAMES & MOORE

DATE: SEPTEMBER 1996

PROJECT No.: 20011-006

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other _____

SOIL BORING LOG INFORMATION
Form 4400-122 7-91

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Madison Kipp	— — — — — — — —	EW-1

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Mc Cumber, Badger State Drilling Co.	06/06/96 (M M D D Y Y)	06/06/96 (M M D D Y Y)	hollow Stem

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
— — — — — —	— — — — — — — —	EW-1	_____ Feet MSL	_____ Feet MSL	14 inches

Boring Location
State Plane _____ N, _____ E S/C/N | Lat ___ ___ ___
_____ 1/4 of _____ 1/4 of Section _____, T _____ N, R _____ E/W | Long ___ ___ ___

Local Grid Location (if applicable)
☐ N ☐ E
_____ Feet ☐ S _____ Feet ☐ W

County	DNR County Code	Civil Town/City/ or Village
Dane	— —	Madison

Sample Number	Length Recovered (in)	Blow Counts	Depth in Foot	Soil/Rock Description And Geologic Origin For Each Major Unit (start 1030)	USCS	Graphic Log	Well Diagram	PID/FID	Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			0	0-.5 Asphalt										
			2	Clay, ~~Moist~~ Some Silt, trace of Sand & gravel, moist.										
			4											
			6											
			8											
			10	Silt, Some Sand, trace gravel, moist. Odor										
1	22"	18-17 19-17	12											
			14	12.5-14.5' Silt, Some Sand, trace gravel, moist										
2	24"	16-17 20-17	16	14.5'-16.5' Slight odor (Same as above) Odor seems stronger.										
			18											
			20											
			22	16.5'-27' (Same as 14.5'-16.5')										
			27											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm
Kirk Hackbarth	Dames & Moore

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other _____

SOIL BORING LOG INFORMATION
Form 4400-122 7-91

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Madison Kipp Corp.	_ _ _ _ _ _ _ _	EW-1

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Mc Cumber, Badger State	06/06/96 (MM DD YY)	06/06/96 (MM DD YY)	

DNR Facility Well No.	Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
_ _ _ _	_ _ _ _ _ _ _ _	EW-1	_____ Feet MSL	_____ Feet MSL	14 inches

Boring Location
State Plane _____ N, _____ E S/C/N
Lat _ _ _ Long _ _ _
_____ 1/4 of _____ 1/4 of Section _____, T _____ N, R _____ E/W

Local Grid Location (if applicable)
☐ N ☐ E
_____ Feet ☐ S _____ Feet ☐ W

County	DNR County Code	Civil Town/City/ or Village
Dane	_ _ _	Madison

Sample Number	Sample Length Recovered (in)	Blow Counts	Depth in Foot	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			26	27' hit sandstone										
			28											
			30											
			32											
			34											
			36											
			38											
			40											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm _____

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: Madison Kipp Corp.	Local Grid Location of Well: ____ ft. ☐N ☐S ____ ft. ☐E ☐W	Well Name: FW-1
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. ____ Long. ____ or	Wis. Unique Well Number: _____ DNR Well Number: _____
Type of Well: Water Table Observation Well ☐ 11; Piezometer ☐ 12	St. Plane ____ ft. N. ____ ft. E.	Date Well Installed: 06/06/96 (m m d d y y)
Distance Well Is From Waste/Source Boundary: ____ ft.	Section Location of Waste/Source: ___ 1/4 of ___ 1/4 of Sec. ___, T. ___ N. R. ___ ☐E ☐W	Well Installed By: (Person's Name and Firm) Kevin McCumber, Badger State Drilling
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No	Location of Well Relative to Waste/Source: u ☐ Upgradient; s ☐ Sidegradient; d ☐ Downgradient; n ☐ Not Known	

A. Protective pipe, top elevation ____ ft. MSL

B. Well casing, top elevation ____ ft. MSL

C. Land surface elevation ____ ft. MSL

D. Surface seal, bottom ____ ft. MSL or 1.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ __

15. Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe _____

17. Source of water (attach analysis): _____

E. Bentonite seal, top ____ ft. MSL or 1.0 ft.

F. Fine sand, top ____ ft. MSL or 6.0 ft.

G. Filter pack, top ____ ft. MSL or 8.0 ft.

H. Screen joint, top ____ ft. MSL or 10.0 ft.

I. Well bottom ____ ft. MSL or 35.0 ft.

J. Filter pack, bottom ____ ft. MSL or 35.5 ft.

K. Borehole, bottom ____ ft. MSL or 35.5 ft.

L. Borehole diameter 14.5 in.

M. O.D. well casing 6.00 in.

N. I.D. well casing 6.50 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: ____ in.
b. Length: 4.0 ft.
c. Material: Steel ☒ 04; Other ☐ __
d. Additional protection? ☐ Yes ☐ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐ __

4. Material between well casing and protective pipe: Bentonite ☒ 30; Annular space seal ☐ __; Other ☐ __

5. Annular space seal: a. Granular Bentonite ☒ 33
b. ____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
d. ____ % Bentonite ..... Bentonite-cement grout ☐ 50
e. 400 lbs Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32
c. _____ Other ☐ __

7. Fine sand material: Manufacturer, product name & mesh size
a. Badger Mining Co.
b. Volume added 100 lbs ft³

8. Filter pack material: Manufacturer, product name and mesh size
a. Red Flint #30
b. Volume added 2000 lbs ft³

9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☒ 24; Other ☐ __

10. Screen material: Sch 80 PVC
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ __
b. Manufacturer Buffalo Well Products
c. Slot size: 0.010 in.
d. Slotted length: 25.0 ft.

11. Backfill material (below filter pack): None ☒ 14; Other ☐ __

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: [signature] Firm: Dames & Moore

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

LOCATION OF BORING

JOB NO.	CLIENT	LOCATION
	Madison Gas	Madison WI

DRILLING METHOD: Hollow Stem auger

SAMPLING METHOD: Split Spoon

BORING NO. MW-4

SHEET 1 OF 1

					DRILLING START	DRILLING FINISH
WATER LEVEL						
TIME					TIME 1330	TIME 1730
DATE					DATE 6/5	DATE 6/5
CASING DEPTH						

DATUM ELEVATION

SURFACE CONDITIONS: Asphalt

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
						0		
						5.1		
	24/8		1/11	14-46-43-39/5		10.2		Sample taken from 1-11 ft Silt, some sand, moist very dense brown
						15.3		
						20.4		
						25.5		0.6 - 35' Silt some sand, trace gravel, moist, very dense, brown
						30.6		
						35.7		35 - 40' Weathered Sandstone
						40.8		
						45.9		40' - 70' Sandstone
						50		
						55		
						60.2		
						65.3		
						70.4		EOB 71'
						5		
						6		
						7		
						8		
						9		
						0		

DRILLING CONTR. No209582

BY h.l.l. DATE 6/5/92 CHK'D BY

(REV. 11.80)

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-9

Facility/Project Name: Madison King Corp	Local Grid Location of Well: ____ ft. ☐N ☐S ____ ft. ☐E ☐W	Well Name: MW-4
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. ___ Long. ___ or	Wis. Unique Well Number: _____ DNR Well Number: _____
Type of Well: Water Table Observation Well ☐ 11; Piezometer ☒ 12	St. Plane ____ ft. N. ____ ft. E.	Date Well Installed: 06/06/96 (m m d d y y)
Distance Well Is From Waste/Source Boundary: ____ ft.	Section Location of Waste/Source: ___ 1/4 of ___ 1/4 of Sec. ___, T. ___ N, R. ___ ☐E ☐W	Well Installed By: (Person's Name and Firm) Kevin Badger State Drilling
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient; d ☐ Downgradient n ☐ Not Known	

A. Protective pipe, top elevation _____ ft. MSL

B. Well casing, top elevation _____ ft. MSL

C. Land surface elevation _____ ft. MSL

D. Surface seal, bottom _____ ft. MSL or 1.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ __

15. Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99

16. Drilling additives used? ☐ Yes ☐ No

Describe _____

17. Source of water (attach analysis):

E. Bentonite seal, top _____ ft. MSL or 10 ft.

F. Fine sand, top _____ ft. MSL or 61.0 ft.

G. Filter pack, top _____ ft. MSL or 63.0 ft.

H. Screen joint, top _____ ft. MSL or 65.0 ft.

I. Well bottom _____ ft. MSL or 70.0 ft.

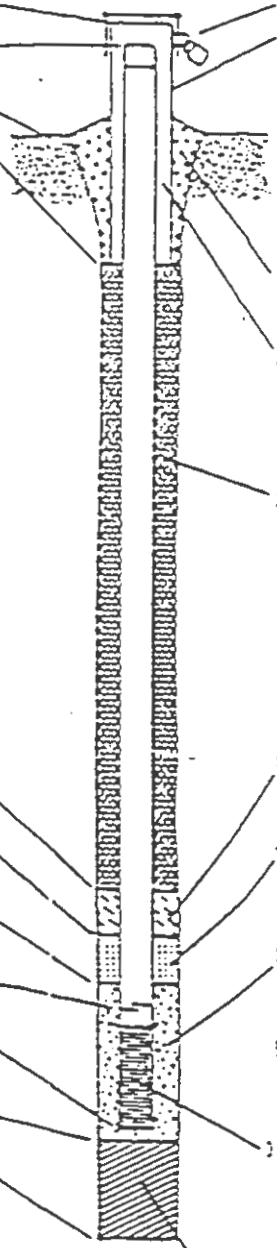
J. Filter pack, bottom _____ ft. MSL or 71.0 ft.

K. Borehole, bottom _____ ft. MSL or 71.0 ft.

L. Borehole diameter _____ in.

M. O.D. well casing _____ in.

N. I.D. well casing _____ in.



1. Cap and lock? ☐ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 9.0 in.
b. Length: 1.0 ft.
c. Material: Steel ☒ 04; Other ☐ __
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐ __

4. Material between well casing and protective pipe: Bentonite ☒ 30; Annular space seal ☐ __; Other ☐ __

5. Annular space seal: a. Granular Bentonite ☐ 33
b. 12 Lbs/gal mud weight . . . Bentonite-sand slurry ☒ 35
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☒ 02; Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32
c. _____ Other ☐ __

7. Fine sand material: Manufacturer, product name & mesh size
a. Badger Minnesota
b. Volume added 50 lbs ft^3

8. Filter pack material: Manufacturer, product name and mesh size
a. Red Flint #30
b. Volume added 175 lbs ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ __

10. Screen material: PVC Sch 40
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ __
b. Manufacturer: Fullerton Well Products
c. Slot size: 0.010 in.
d. Slotted length: 5.0 ft.

11. Backfill material (below filter pack): None ☒ 14; Other ☐ __

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Kirk Hasbrook Firm: Dames & Moore

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, not more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each

Wisconsin
ent of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B Rev. 4-90

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

Project Name	County Name	Well Name
Madison Kipp	Dane	MW-4

License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well Number
_____	__	_____	____

his well be purged dry? ☐ Yes ☒ No

development method
urged with bailer and bailed ☐ 41
urged with bailer and pumped ☐ 61
urged with block and bailed ☐ 42
urged with block and pumped ☐ 62
urged with block, bailed and pumped ☐ 70
ompressed air ☐ 20
ailed only ☐ 10
umped only ☒ 51
pumped slowly ☐ 50
Other _____ ☐ __

e spent developing well 135 min.

th of well (from top of well casing) 70.4 ft.

de diameter of well 2.07 in.

ume of water in filter pack and well ing 10.7 gal.

ume of water removed from well 107.0 gal.

ume of water added (if any) ___/___ gal.

rce of water added /

alysis performed on water added? ☐ Yes ☐ No
yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 38.74 ft.	38.89 ft.
Date	b. 06 07 96 (m m d d y y)	06 07 96 (m m d d y y)
Time	c. 11:15 ☒ a.m. ☐ p.m.	1:30 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) brown, very turbid	Clear ☒ 20 Turbid ☐ 25 (Describe) Clear

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	___/___ mg/l	___/___ mg/l
15. COD	___/___ mg/l	___/___ mg/l

ditional comments on development:

eveloped by: Person's Name and Firm

Kirk Hackbarth
Dames & Moore

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: [signature]

Print Initials: KLH

Firm: Dames & Moore

: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

Dames & Moore

LOCATION OF BORING	JOB NO.	CLIENT	LOCATION
	[illegible]	Madison Kipp	Madison WI

DRILLING, METHOD:	hollow Stem auger
SAMPLING METHOD:	Split Spoon
BORING NO.	MW-4A
SHEET	1 of 3

					DRILLING START	DRILLING FINISH
WATER LEVEL					TIME	TIME
TIME					0900	1300
DATE					DATE	DATE
CASING DEPTH					6/5	6/5

DATUM ELEVATION

SURFACE CONDITIONS: Asphalt

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
						0		
						1		
						2		
	24/19		1/4.5	7-13-15-13		3		2.5'-4.5' Silt, trace of Sand? Gravel, moist, brown to tan
						4		
						5		
	24/10		2/7.0	9-15-43-50/5		6		5'-7' Silt, trace of Sand? Gravel, moist, brown to tan
						7		
	24/22		3/9.5	13-16-23-16		8		7.5'-9.5' Silt, (Same as 5'-7')
						9		
						0		
	24/20		4/12	13-13-17-13		1		10'-12' Silt, Some Sand, trace gravel, moist brown to tan
						2		
	24/22		5/14.5	7-12-15-17		3		12.5'-14.5' (Same as 5'-7')
						4		
						5		
	24/20		6/17	13-15-48-48		6		15'-17' (Same as 5'-7') moist
						7		
	24/21		7/19.5	13-19-22-35		8		17.5-19.5' (Same as 5'-7') pieces of Sand stone
						9		
						0		

DRILLING CONTR. _____

BY RTM DATE 6/5/88 CHK'D BY _____

No209582

DAMES & MOORE 1-131 (REV. 11-80)

LOCATION OF BORING

JOB NO.	CLIENT	LOCATION
	Madison Gas	Madison, WI

DRILLING METHOD:	BORING NO. MW-4A
hollow stem auger	SHEET 2 of 3
SAMPLING METHOD:	DRILLING

					START	FINISH
WATER LEVEL					TIME 0900	TIME 1300
TIME						
DATE					DATE 6/5	DATE 6/5
CASING DEPTH						

DATUM ELEVATION

SURFACE CONDITIONS:

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO. / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	
						20		
	24/11		8/22	13-35-36-32		21		Silt, some sand trace gravel, moist brown
						22		
						23		
						24		
						25		
	24/10		9/27	18-28-50/3		26		Same as 20'-22'
						27		
						28		
						29		
						30		
	24/10		10/32	44-50/5		31		Same as 20'-22'
						32		
						33		
						34		
						35		
	24/24		11/37	23-33-48-50/5		36		with sandstone, Silt Sand very moist, green to brown
						37		
						38		
						39		
						40		

DRILLING CONTR. _____

BY _____ DATE _____ CHK'D BY _____

(8.1.93) (REV 11-88)

No209582

LOCATION OF BORING

JOB NO.	CLIENT	LOCATION
	Madison Co	Madison, Ill.

DRILLING METHOD: hollow stem auger

SAMPLING METHOD: split spoon

BORING NO. MW-4A

SHEET 3 OF 3

WATER LEVEL				
TIME				
DATE				
CASING DEPTH				

DRILLING	START	FINISH
TIME	0900	1300
DATE	6/5	6/5

DATUM

ELEVATION

SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	DEPTH OF CASING	SAMPLE NO / SAMPLE DEPTH	BLOWS/FT. SAMPLER	NUMBER OF RINGS	DEPTH IN FEET	SOIL GRAPH	SURFACE CONDITIONS:
	3 / 3		12 / 40.5			40		Weathered Sandstone, moist, greenish brown
						41		
						42		41'-51' → Sandstone
						43		
						44		
						45		
						46		
						47		
						48		
						49		
						50		
						51		← Bottom of boring 51'
						2		
						3		
						4		
						5		
						6		
						7		
						8		
						9		
						0		

DRILLING CONTR. _____

No209582

BY _____ DATE 6/5/92 CHK'D BY _____

ENG 431 (REV. 11-80)

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: Madison Kipp Corp	Local Grid Location of Well: ____ ft. ☐N ☐S ____ ft. ☐E ☐W	Well Name: MW-4A
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. ____ Long. ____ or St. Plane ____ ft. N. ____ ft. E.	Wis. Unique Well Number: _____ DNR Well Number: _____
Type of Well: Water Table Observation Well ☒ 11; Piezometer ☐ 12	Section Location of Waste/Source: ___ 1/4 of ___ 1/4 of Sec. ___, T. ___ N, R. ___ ☐E ☐W	Date Well Installed: 06/05/96 (mm dd yy)
Distance Well Is From Waste/Source Boundary: ____ ft.	Location of Well Relative to Waste/Source: u ☐ Upgradient; s ☐ Sidegradient; d ☐ Downgradient; n ☐ Not Known	Well Installed By: (Person's Name and Firm) Kevin McCarnt, Badger State Drilling C
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No		

A. Protective pipe, top elevation _____ ft. MSL
B. Well casing, top elevation _____ ft. MSL
C. Land surface elevation _____ ft. MSL
D. Surface seal, bottom _____ ft. MSL or 1.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

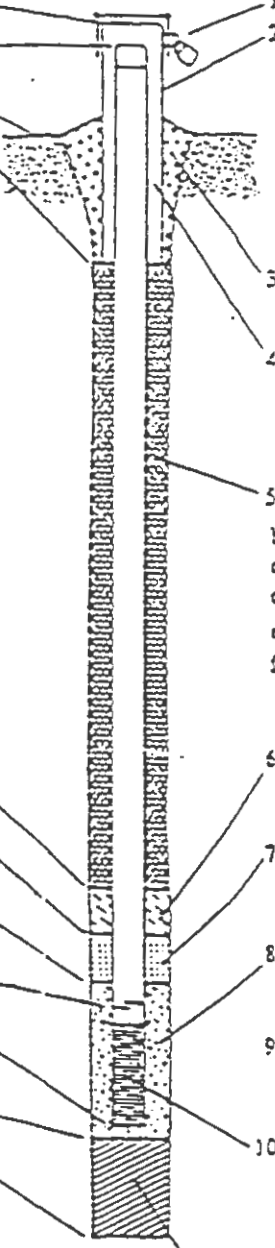
14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ __

15. Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis): _____

E. Bentonite seal, top _____ ft. MSL or 1.0 ft.
F. Fine sand, top _____ ft. MSL or 32.0 ft.
G. Filter pack, top _____ ft. MSL or 34.0 ft.
H. Screen joint, top _____ ft. MSL or 35.0 ft.
I. Well bottom _____ ft. MSL or 50.0 ft.
J. Filter pack, bottom _____ ft. MSL or 51.0 ft.
K. Borehole, bottom _____ ft. MSL or 51.0 ft.
L. Borehole diameter 8.0 in.
M. O.D. well casing 2.07 in.
N. I.D. well casing 2.30 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 9.0 in.
b. Length: 1.0 ft.
c. Material: Steel ☒ 04; Other ☐ __
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____
3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐ __
4. Material between well casing and protective pipe: Bentonite ☒ 30; Annular space seal ☐ __; Other ☐ __
5. Annular space seal: a. Granular Bentonite ☒ 33
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. 750 lbs. Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32
c. _____ Other ☐ __
7. Fine sand, material: Manufacturer, product name & mesh size
a. Badger Minerals
b. Volume added 50 lbs ft³
8. Filter pack material: Manufacturer, product name and mesh size
a. Red Flint #30
b. Volume added 550 lbs ft³
9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ __
10. Screen material: Sch 40 PVC
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ __
b. Manufacturer: Buffalo Well Products
c. Slot size: 0.01 in.
d. Slotted length: 15.0 ft.
11. Backfill material (below filter pack): None ☒ 14; Other ☐ __

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Kirt Hardt | Firm: Dames & Moore

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B Rev. 4-90

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Madison Kipp	Dane	MW-4A

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well Number
_____	__	_____	__

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method
- surged with bailer and bailed ☐ 41
- surged with bailer and pumped ☐ 61
- surged with block and bailed ☐ 42
- surged with block and pumped ☐ 62
- surged with block, bailed and pumped ☐ 70
- compressed air ☐ 20
- bailed only ☐ 10
- pumped only ☒ 51
- pumped slowly ☐ 50
- Other _____ ☐ __

3. Time spent developing well 140 min.

4. Depth of well (from top of well casing) 49.4 ft.

5. Inside diameter of well 2.07 in.

6. Volume of water in filter pack and well casing 8.7 gal.

7. Volume of water removed from well 87.0 gal.

8. Volume of water added (if any) ____.__ gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 38.18 ft.	38.34 ft.
Date	b. 06/07/96 (m m d d y y)	06/07/96 (m m d d y y)
Time	c. 08:40 ☒ a.m. ☐ p.m.	11:00 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	4.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 / Turbid ☒ 15	Clear ☐ 20 / Turbid ☐ 25
(Describe)	greenish brown very turbid	Clear

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Additional comments on development:

Well developed by: Person's Name and Firm

Name: Kirk Hackbarth

Firm: Dames & Moore

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: [signature]

Print Initials: KLH

Firm: Dames & Moore

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

ATTACHMENT B
DETAILED ESTIMATES OF REMEDIATION COSTS

Remedial Options

Soil:

Soil vapor extraction (SVE) and excavation with off-site disposal were considered for soil remediation. Soil vapor extraction is considered feasible; however, the system would be extensive, due to the heterogeneities and low permeability at the site. Because the areas of impacted soil appear to be limited in size, excavation is considered more cost-effective. However, because the areas of impacted soil are adjacent to the building, shoring will be required. Additionally, the former vapor degreaser vent is in an active area, so there may be some restrictions on the extent to which excavation equipment can access the impacted soil.

Groundwater:

Because groundwater flow conditions and the extent of contamination have been determined, an assessment of groundwater treatment options is possible. Conventional pump and treat was considered, as well as emerging technologies, which include bioremediation and ozone sparging.

Ozone sparging is comparable to conventional air sparging, in that a gas is released in a well point. However, the remediation mechanism differs. With conventional sparging, the gas is air, which removes contaminants from the groundwater by means of forced volatilization. The volatilized contaminants are then removed from the soil above the water table, typically by means of soil vapor extraction. The contaminants are then released to the atmosphere. With ozone sparging, however, the contaminants are actually destroyed. Ozone (0_3), oxidizes the contaminant, with the by-products being carbon dioxide and water. The means by which ozone is released is also somewhat different than for air sparging. A reason for not considering air sparging at this site is the low permeability of site soils, which reduces the effective radius of an air sparge point. The ozone approach combines the ozone sparge points with a groundwater pump, which circulates the water, pushing the ozone out to a greater radius than would be possible by simply releasing the ozone without any flow control. This system is illustrated on Figure B-1.

We also have concerns about an active bioremediation approach for the MKC site. This approach would try to address both soil and groundwater with a single system, in which groundwater is extracted, and passed through a bioreactor. The bioreactor applies the necessary microbes and nutrients, which remove the contaminants. The microbes and nutrients are still in the groundwater after the contaminants are removed. This water is then applied to impacted soils by means of an infiltration gallery. This applies the necessary components for the remediation of the soil. However, for an infiltration gallery to be operated in winter months, it must be installed below the frost line, at a depth of 4 to 5 feet. Our investigation has shown the highest concentration of contaminants to be at depths of less than 4 feet. Consequently, the treated water would be applied below the highest contaminant concentrations, and would therefore not effectively remediate the soil. A simplified view of this scenario is illustrated in Figure B-2.

Summary:

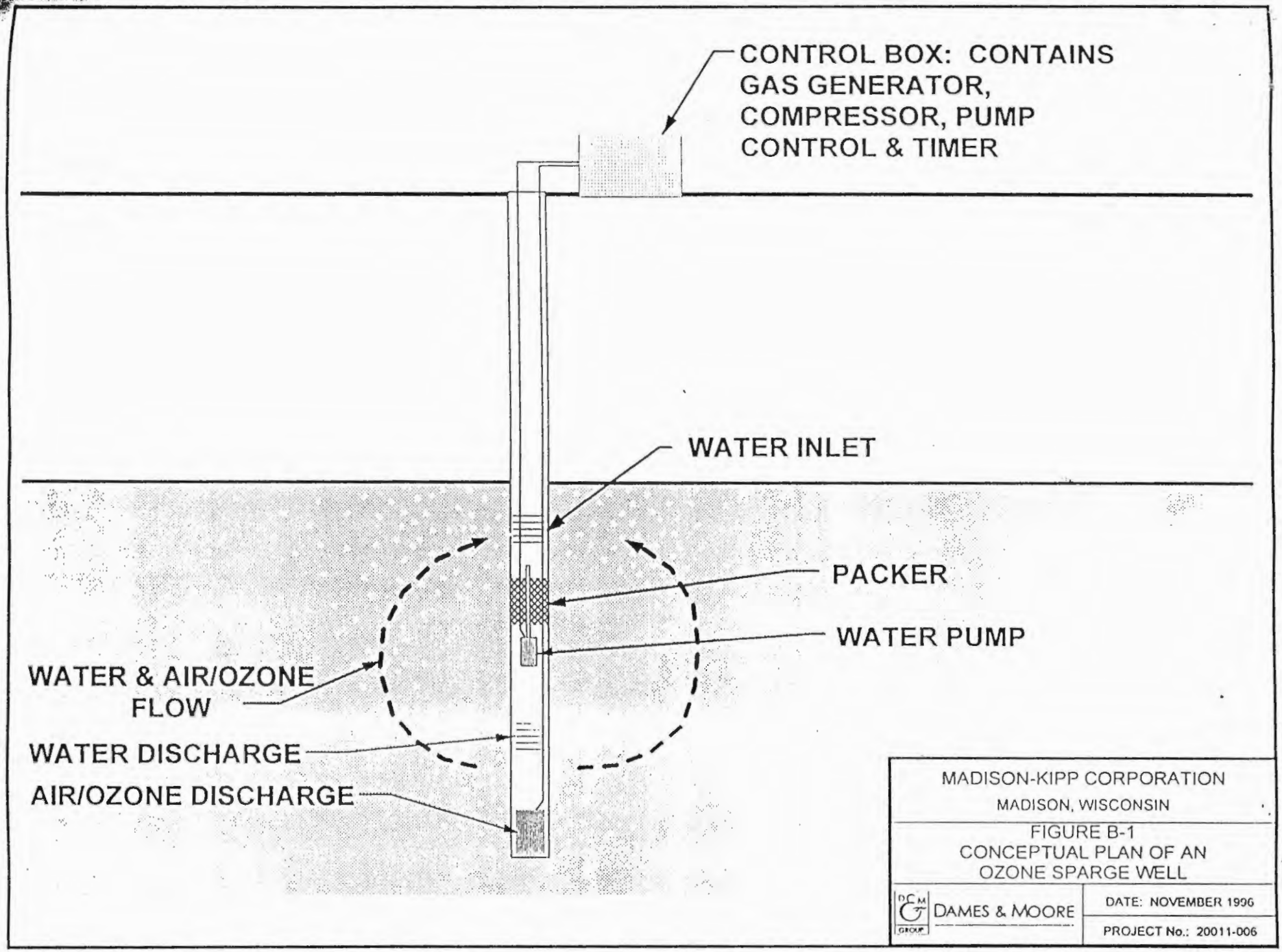
The estimated cumulative costs of the remedial options approaches are shown on Figure B-3. Several assumptions were made with respect to the time frames. For all scenarios it was assumed that soil remediation by means of SVE would take 5 years. It was further assumed that groundwater remediation by means of conventional pump and treat would take 10 years before acceptable flexible

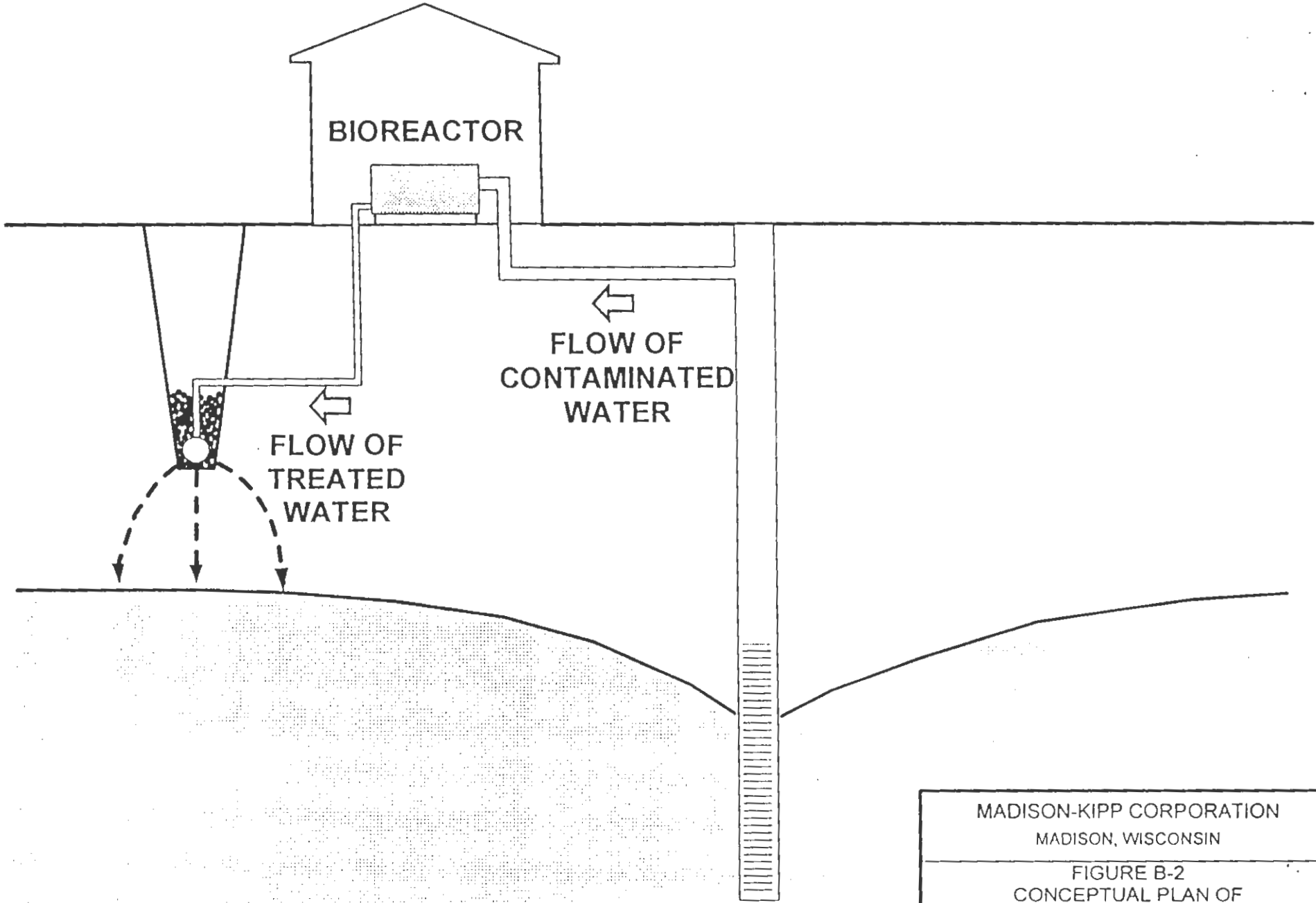
groundwater standards would be met. Groundwater remediation by means of ozone sparging is estimated at 3 years.

Based upon the graph presented on Figure B-3, ozone sparging is considered to be the most cost-effective groundwater option, regardless of the soil options (excavation or SVE).

Recommendations:
Based upon the full delineation of impacted soil and the established site-specific RCLs (see report), the approach for soil remediation will be evaluated. If the areas are accessible and the work can be completed with a minimum of shoring (i.e., box shoring), MKC will proceed with soil remediation by means of excavation and disposal. Alternatively, another approach will be recommended for soil remediation.

As discussed in the report, a period of groundwater monitoring is recommended subsequent to the completion of soil remediation. If active groundwater remediation is indicated at the end of that monitoring period, current technology and cost estimates indicate that ozone sparging will be the recommended approach.


CONTROL BOX: CONTAINS GAS GENERATOR, COMPRESSOR, PUMP CONTROL & TIMER
WATER INLET
PACKER
WATER PUMP
WATER & AIR/OZONE FLOW
WATER DISCHARGE
AIR/OZONE DISCHARGE
MADISON-KIPP CORPORATION
MADISON, WISCONSIN
FIGURE B-1
CONCEPTUAL PLAN OF AN OZONE SPARGE WELL
DAMES & MOORE
DATE: NOVEMBER 1996
PROJECT No.: 20011-006



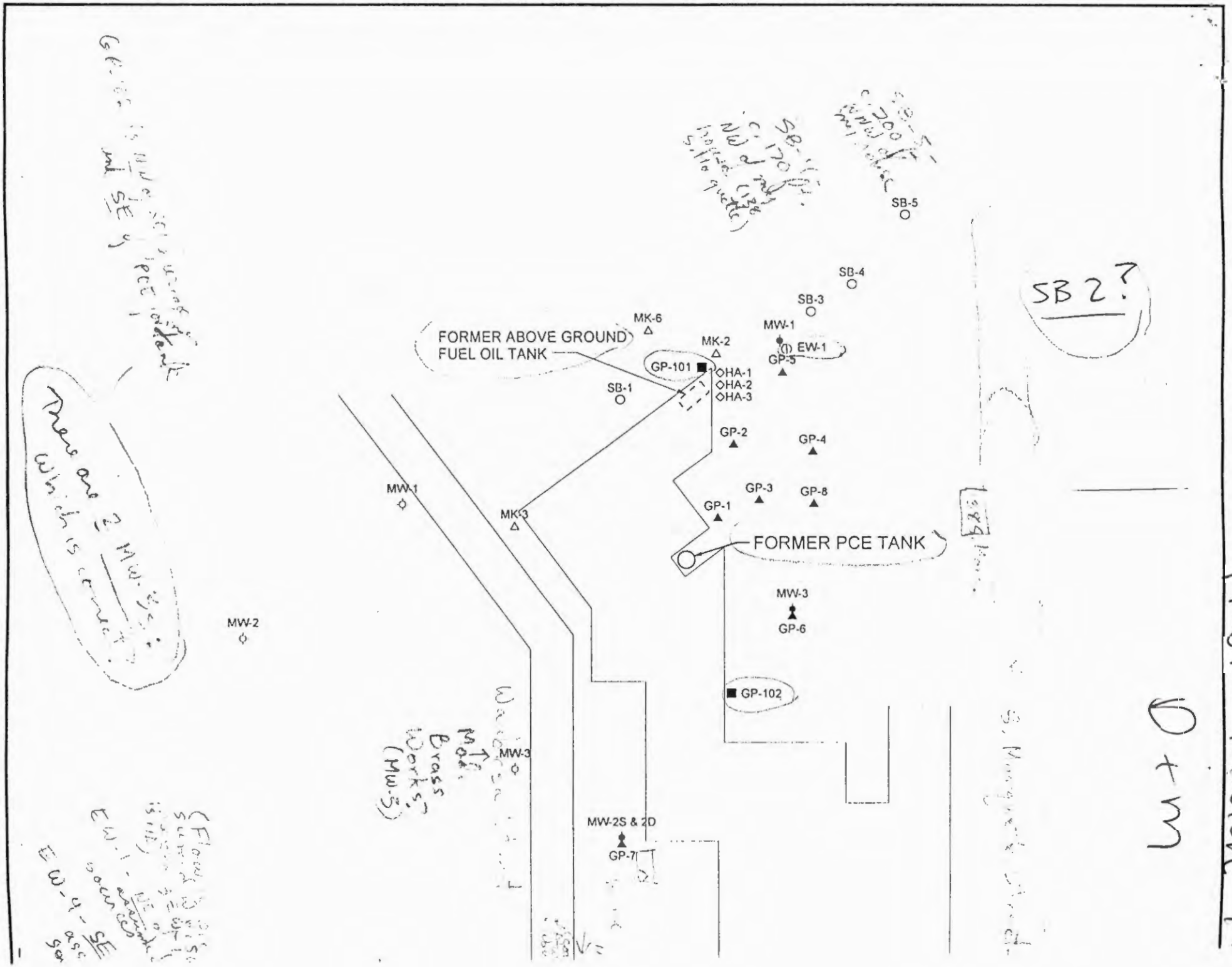
MADISON-KIPP CORPORATION
MADISON, WISCONSIN

FIGURE B-2
CONCEPTUAL PLAN OF
BIOREMEDIATION SYSTEM

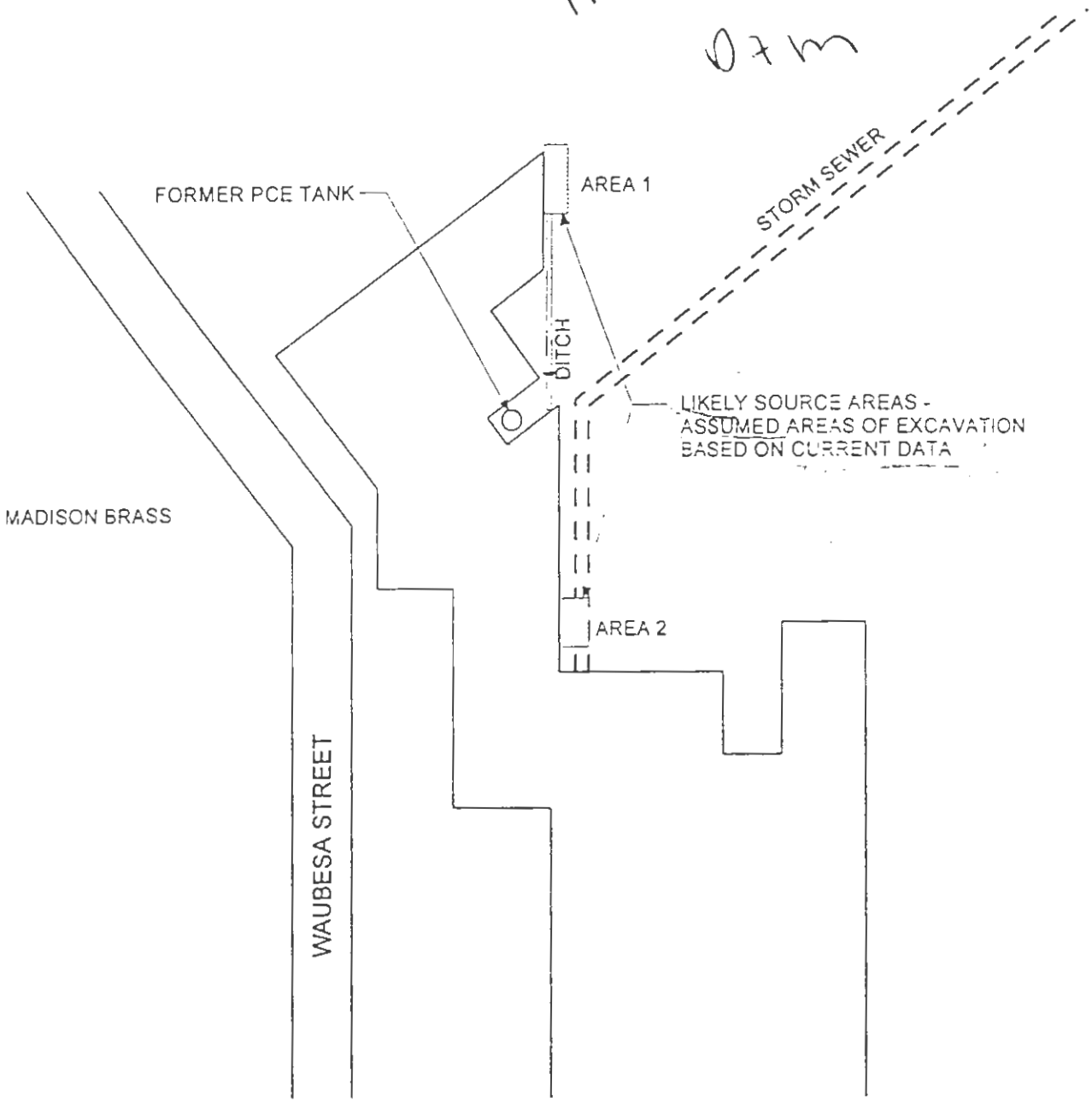
DAMES & MOORE

DATE: NOVEMBER 1996

PROJ. No.: 20011-006


FORMER ABOVE GROUND FUEL OIL TANK
FORMER PCE TANK
MK-6
MK-2
MK-3
GP-101
HA-1
HA-2
HA-3
SB-1
SB-3
SB-4
SB-5
MW-1
EW-1
GP-5
GP-2
GP-4
GP-3
GP-8
GP-1
MW-3
GP-6
GP-102
MW-2
MW-2S & 2D
GP-7
SB 2?
From March 97
0 + m

From March 97
0 7 m



SCALE IN FEET

0 50 100 150 200

NORTH

MADISON-KIPP CORPORATION

MADISON, WISCONSIN

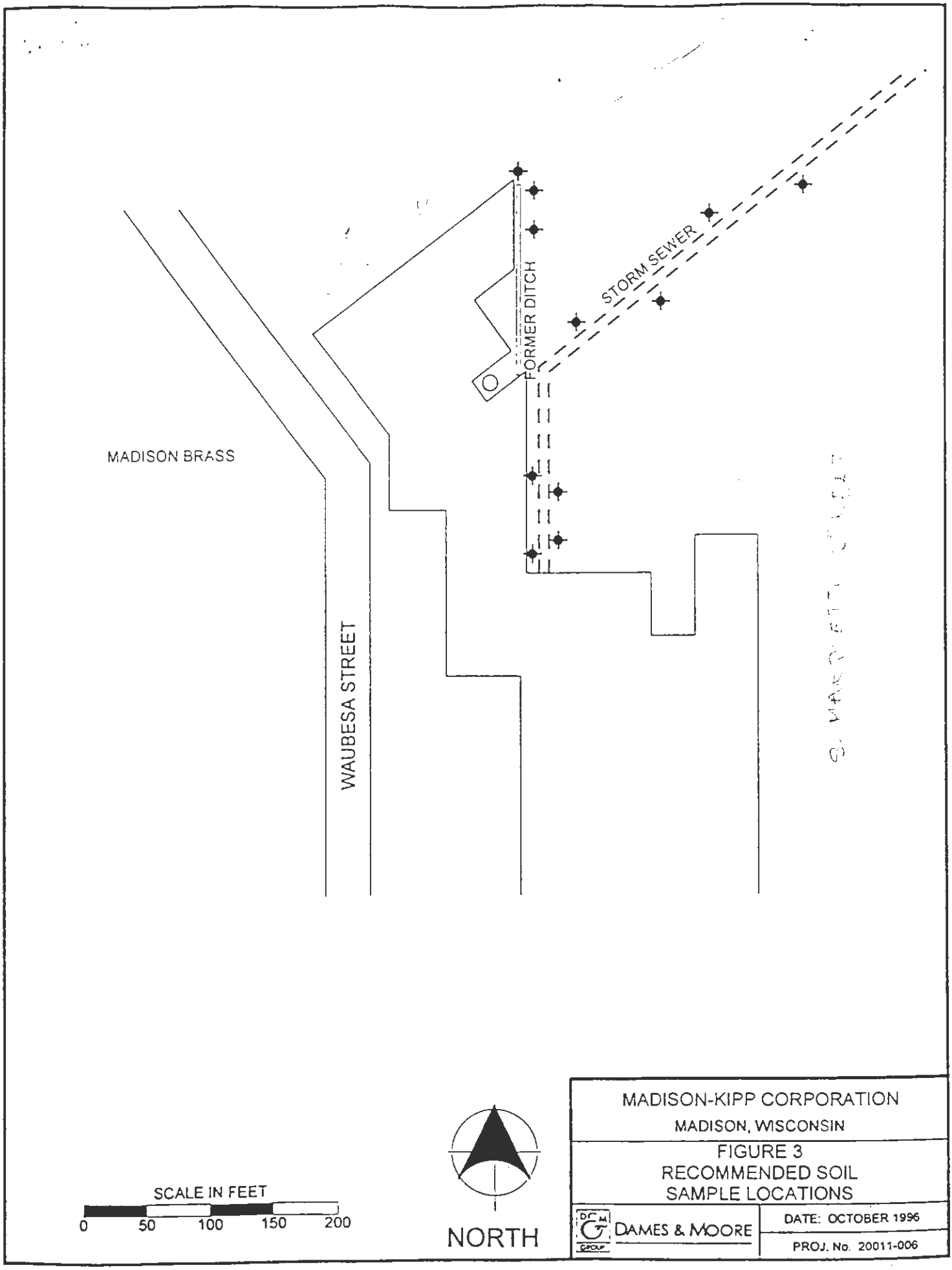
FIGURE 2
LIKELY SOURCE AREAS
OF CONTAMINATION

DAMES & MOORE

DATE: OCTOBER 1996

PROJ. No. 20011-006

EXCAV SRF


MADISON BRASS
WAUBESA STREET
FORMER DITCH
STORM SEWER
SCALE IN FEET
0
50
100
150
200
NORTH
MADISON-KIPP CORPORATION
MADISON, WISCONSIN
FIGURE 3
RECOMMENDED SOIL
SAMPLE LOCATIONS
DAMES & MOORE
DATE: OCTOBER 1996
PROJ. No. 20011-006

LEGEND

- △ GEOPROBE SAMPLE LOCATION (9/94)
- ◇ HAND-AUGER SAMPLE LOCATION (10/94)
- ○ SOIL BORING LOCATION (1/95)
- ▲ GEOPROBE SAMPLE LOCATION (6/95)
- ♦ MADISON-KIPP MONITOR WELL (1/95; 8/95; 6/96)
- ◇ MADISON BRASS MONITOR WELL
- ⦶ EXTRACTION WELL (6/96)
- ■ GEOPROBE SAMPLE LOCATION (7/96)

WAUBESA STREET

MW-4S & 4D

ATWOOD AVENUE

SCALE IN FEET

0 100 200 300 400

NORTH

MADISON-KIPP CORPORATION

MADISON, WISCONSIN

FIGURE 1
SITE INVESTIGATION
SAMPLE LOCATIONS

DCM GROUP DAMES & MOORE

DATE: DECEMBER 1996

PROJECT No.: 20011-005