

SITE STATUS REPORT

for

Humboldt Bulk Facility
Highway 75 and Kittson County Road 6
Humboldt, MN

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MPCA File No.: LEAK00005361

June 30, 2003

MPCA, MAR Division
PER / SS section

prepared by

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June 30, 2003

Ms. Miriam Horneff
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155

RE: Site Status Report
Humboldt Bulk Facility
MPCA Leak No. LEAK00005361
WCEC Job #: 92-405-30

Dear Ms. Horneff:

The following report gives the results of the current soil boring investigation described in the FY 2003 Work Plan for the Humboldt Bulk Facility. A previous soil investigation was performed at this site in 1992-1993 (Appendix F). During that investigation, the "worst-case" area was determined to be the area east of the former AST area. Free product was observed in monitoring well MW2, located near the center of the contamination plume, and an excavation was recommended. In order to compare the extent and magnitude of the current contamination plume to the 1993 contamination plume and to determine the current horizontal extent of free product, a push probe investigation was completed. Included in this report are the results of the free product plume delineation, risk assessment, and groundwater monitoring. In addition, the formerly recommended excavation has been re-evaluated and site recommendations have been made.

SITE INFORMATION

The Humboldt bulk facility is located on the west corner of the intersection of Highway 75 and Kittson County Road 6, adjacent to the Burlington Northern spur line (Figures 1 and 2). Legal description of the site is the SW/4 of the SW/4 of the SE/4 of the section 23, T 163N, R 50W, St. Vincent Township, Kittson County, or 48° 55' 13"N, 97° 05' 38"W on the Humboldt 7.5' topographic quadrangle map (USGS, 1974).

The site is on the south edge of the small rural community of Humboldt. The bulk facility consisted of five petroleum ASTs, a fertilizer plant, and a dispenser building.

FREE PRODUCT PLUME DELINEATION *w/ to 6' FP*

During the 1993 investigation, free product was observed in monitoring well MW2 on several occasions. During the current investigation, four free product borings (FP1-FP4) were hand augered in the previously proposed excavation area around monitoring well MW2 (Figure 2). Free product was not observed in any of the borings, however a slight sheen could be seen on water in FP1, FP3, and FP4. Boring FP2 was dry to 4'.

SOIL SAMPLING

Five test holes (TH9-TH13) were advanced northeast to southeast of the former AST area between the source area and monitoring wells MW1 and MW3 (Figure 2). An additional hand auger hole (HA2) was advanced west-northwest of the former AST area across the railroad tracks. In comparison to the previous test holes, test hole TH9 is located northeast of previous (1993) TH6, between the former tank area and monitoring well MW1. Test hole TH10 is located southeast of the former tank area. Test hole TH11 is located just north of 1993 test hole TH5. Test hole TH12 is located further north of 1993 test hole TH5 and test hole TH11. Test hole TH13 is located east of the former tank area, between the tank area and monitoring well MW3.

Soil samples were analyzed in the field with a photoionization detector (PID). Organic vapors ranging from 0.2 ppm to 12.2 ppm were detected in test hole TH11 between 6' and 10', and from 4.5 ppm to 52.8 ppm were detected in TH13 between 7' and 11' (Table 1).

Soil samples were also collected for laboratory analysis at 7' in all five test holes and at 32' in TH11. Samples were sent to NTS for laboratory analysis of benzene, toluene, ethyl benzene, and xylenes (BTEX), MTBE, gasoline range organics (GRO), and diesel range organics (DRO). Contamination was not detected by the laboratory in soil samples collected from test holes TH9, TH10, TH12 or TH13. In test hole TH11, 220 mg/kg GRO and 150 mg/kg DRO were detected (Table 2) at 7', but no contamination was detected in the soil sample collected at 32'.

Water samples were collected from all five borings and the hand auger boring HA2 and were sent to NTS for laboratory analysis of VOCs, GRO and DRO. In test holes TH9 and TH10, DRO was detected at levels of 270 and 130 ppb, respectively. In TH11, benzene (2.1 ppb), ethyl benzene (2.4 ppb), GRO (130 ppb), and DRO (1200 ppb) were detected. In test hole TH12, contamination was not detected. In TH13, ethyl benzene (300 ppb), xylenes (2350 ppb), GRO (8700 ppb), and DRO (280,000 ppb) were detected.

In addition, in test holes TH11 and TH13, some additional contaminants were detected: n-butylbenzene, sec-butylbenzene, isopropylbenzene, p-isopropylbenzene, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and tetrahydrofuran. Isopropylbenzene and naphthalene were both above their respective HRLs in test hole TH13.

Based on field and laboratory analyses of soil samples and laboratory analyses of water samples, contaminant concentrations appear to be consistent with the results of the 1993 investigation with the exception of the area around test hole TH13. No test holes were advanced in this location during the 1993 investigation. Results from the current investigation indicate slightly higher contaminant concentrations than previously estimated in the area around test hole TH13, which causes the contaminant plume to be elongated more to the southeast (Figures 2a and 2b).

GROUNDWATER MONITORING

Monitoring wells MW1-MW3 were installed in 1993. Free product was discovered in monitoring well MW2 in 1993. Monitoring wells sampling was discontinued in 1995 and has resumed for this investigation. Due to off-site access delays, only one round of sampling has been completed at this time. Groundwater samples were analyzed for VOCs, GRO, and DRO. In MW1, laboratory analysis detected DRO (150 ppb). In MW2, benzene (150 ppb), xylenes (61 ppb), GRO (2400 ppb), and DRO (35000 ppb) were detected. In MW3, contamination was not detected. Benzene was above the HRL (10 ppb) in MW2.

The results of the current investigation are consistent with the 1993 groundwater monitoring results, but contaminant concentrations appear to have decreased slightly (Tables 7 and 8, and Appendix F). In 1993, GRO and DRO were detected during one sampling event in MW1 (200 ppb and 5600 ppm, respectively). During this investigation, only 150 ppb DRO was detected. In MW2, contamination still remains and benzene is still above the HRL, but free product was not observed and contaminant concentrations have decreased. In MW3, benzene (3.4 ppb) and toluene (1.5 ppb) were detected during one 1993 sampling event, and only toluene (1.3 ppb) was detected during one other event. During this investigation, contamination was not detected in MW3.

Groundwater flow direction was calculated using water level elevations and was determined to be to the northeast (Figure 3). In 1993, groundwater flow had been determined to be to the northwest and to the east-northeast during two different monitoring events.

RISK ASSESSMENT

A 500-foot walking survey and groundwater receptor survey were completed for this site (Figure 2c and Table 9). Kittson County Rural Water was contacted and verified that rural water is utilized by everyone within 500 ft of the site. During the walking survey, a "well" was identified at the Dennis Diamond residence, located south of the site. Upon observation by WCEC, it was determined that the well located in the basement is actually a cistern that is used to water the garden, and the alkalai water collecting in the cistern is not drinkable. A water sample was collected and was sent to NTS for analysis of VOCs, GRO, and DRO. Laboratory analysis detected 4.0 ppb tetrahydrofuran (Tables 3 and 4).

A County Well Index (CWI) search was performed and the Minnesota Department of Health (MDH) was contacted to identify any wells within 1 mile of the site. Three wells were identified, which were also identified in the previous investigation (Table 10 and Appendix D). Two of the wells are within 500 ft southwest of the site and are 644 ft and 600 ft deep. The third well is 1000 ft east of the site and is 141 ft deep (Figure 4). According to MDH well records, all three of the wells are test wells. (According to the 1994 RI report, the 600 ft well is used by the railroad and the 141 ft well is a domestic well.)

SUMMARY/CONCLUSION

Free product was not observed in the hand auger holes or in the monitoring well located in the previously proposed excavation area; a slight sheen was observed on water in several of the holes. Based on field and laboratory analyses, only the contamination concentrations in the area around test hole TH13 are higher than was previously estimated. Therefore, the contamination plume appears to be similar to the 1994 plume, but is elongated more to the southeast. The area is supplied by rural water, and the nearest groundwater receptors do not appear to be at risk from this release.

Based on the results of this investigation, it does not appear that an excavation is necessary at this time. Therefore, WCEC recommends one year of quarterly groundwater monitoring. Water samples should be analyzed for BTEX/MTBE, GRO, and DRO. Results of groundwater monitoring will be submitted in an Annual Monitoring Report (fact sheet 3.26). If little to no free product is observed and contamination concentrations remain low after one year of sampling, closure will be requested.

If you have any questions or concerns regarding this site, please give me a call at (320) 589-2039.

Sincerely,



Matt Johnson
Project Manager

Enclosures

TABLES

**Table 1
 Results of Soil Headspace Screening**

Depth (ft)	Soil Boring					
	TH9	TH10	TH11	TH12	TH13	
1						
2						
3						
4	0	0	0	0	0	0
5						
6		0	0.2			
7	0	0	1.9			4.5
8	0	0	12.2	0		52.8
9				0		
10			8.8			
11						30
12	0	0	0	0	0	0
13						
14						
15						
16			0			0
17						
18						
19						
20			0			0
21						
22						
23						
24						
25						
26			0			
27						
28						
29						
30						
31						
32			0			

Table 2
Analytical Results of Soil Samples

Boring, Depth (ft)	Date Sampled	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	GRO	DRO	Lab Type
TH9 (7)	05/20/03	<0.100	<0.100	<0.070	<0.200	<0.120	<4	<10	Fixed
TH10 (7)	05/20/03	<0.100	<0.100	<0.070	<0.200	<0.120	<4	<10	Fixed
TH11 (7)	05/20/03	<0.200	<0.200	<0.140	<0.400	<0.240	220	150	Fixed
TH11 (32)	05/20/03	<0.100	<0.100	<0.070	<0.200	<0.120	<4	<10	Fixed
TH12 (7)	05/20/03	<0.100	<0.100	<0.070	<0.200	<0.120	<4	<10	Fixed
TH13 (7)	05/20/03	<0.100	<0.100	<0.070	<0.200	<0.120	<4	<10	Fixed
Trip Blank	05/20/03	<0.100	<0.100	<0.070	<0.200	<0.120	<4		Fixed

Notes: Report results in mg/kg.

Table 3
Analytical Results of Water Samples Collected from Borings

Boring Number	Date Sampled	Sampled Depth	Benzene	Toluene	Ethyl benzene	Xylenes	MTBE	GRO	DRO	Lab Type
TH9	05/21/03	8.2' ^	<1.0	<1.0	<1.0	<3.0	<1.0	<60	270	Fixed
TH10	05/20/03	3.0'	<1.0	<1.0	<1.0	<3.0	<1.0	<60	130	Fixed
TH11	05/21/03	11.1'	2.1	<1.0	2.4	<3.0	<1.0	130	1200	Fixed
TH12	05/21/03	2.4'	<1.0	<1.0	<1.0	<3.0	<1.0	<60*	<100	Fixed
TH13	05/20/03	3.0'	<500	<500	3000	2350	<500	8700*	280000	Fixed
Diamond Residence	05/21/03		<1.0	<1.0	<1.0	<3.0	<1.0	<60	<100	Fixed
HA2	05/21/03		<1.0	<1.0	<1.0	<3.0	<1.0	<60*	<100	Fixed
Trip Blank	05/20/03		<1.0	<1.0	<1.0	<3.0	<1.0	<60		Fixed
Field Blank										
Lab Blank										
HRL			10	1000	700	10000				

Notes: Results reported in ppb. * Preserved at a pH of 6.0 ^water level after pumping

Table 4
Other Contaminants Detected in Water Samples
Collected from Borings (Petroleum or Non-petroleum Derived)

Compound	HRL (ug/L)	TH11 05/21/03	TH13 05/20/03	Diamond Res 05/21/03	Trip Blank 05/21/03
n-Butylbenzene	-	6.4	13,000	<1.0	<1.0
sec-Butylbenzene	-	1.4	3300	<1.0	<1.0
Isopropylbenzene	300	2.1	1500	<1.0	<1.0
p-Isopropyltoluene	-	1.6	1600	<1.0	<1.0
n-Propylbenzene	-	1.8	5000	<1.0	<1.0
Naphthalene	300	5.2*	17,000*	<2.0*	<2.0*
1,2,4-Trimethylbenzene	-	3.4	7000	<1.0	<1.0
1,3,5-Trimethylbenzene	-	5.1	4100	<1.0	<1.0
Tetrahydrofuran	HBV 100	<2.0	<1000	4.0	<2.0

Notes: Results reported in ppb. * Laboratory Control Spike not within control limits (81%)

Table 5
Monitoring Well Completion Information

Well Number	Unique Well Number	Date Installed	Surface Elevation	Top of Riser Elevation	Bottom of Well (Elevation)	Screen Interval (Elev. - Elev.)
MW1	517390	02/10/93	99.24	102.62	88.60	88.60 - 98.60
MW2	517389	02/10/93	100.40	103.01	88.49	88.49 - 98.49
MW3	517391	02/10/93	99.60	103.14	88.68	88.68 - 98.68

Table 6
Water Level Measurements in Wells

Well Number	Date Sampled	Depth of Water from Top of Riser	Product Thickness (in)	Depth of Water Below Grade	Relative Groundwater Elevation	Water Level Above Screen (Y/N)
MW1	05/07/03	5.65	0	2.27	96.97	N
MW2	05/07/03	4.59	0	1.98	98.42	N
MW3	05/07/03	5.49	0	1.95	97.65	N

Notes: Results reported in feet unless otherwise noted.

Table 7
Analytical Results of Water Samples Collected from Wells

Well #	Date Sampled	Benzene	Toluene	Ethyl benzene	Xylenes	MTBE	GRO	DRO	Lab Type
MW1	05/07/03	<1.0**	<1.0**	<1.0**	<3.0**	<1.0	<60	150	Fixed
MW2	05/07/03	150	<5.0	<5.0	61	<5.0	2400	35000*	Fixed
MW3	05/07/03	<1.0	<1.0	<1.0	<3.0	<1.0	<60	<100	Fixed
Trip Blank	05/07/03	<1.0	<1.0	<1.0	<3.0	<1.0	<60		Fixed
Field Blank									
Lab Blank									
HRL(ug/L)		10	1000	700	10000				

Notes: Results reported in ppb.

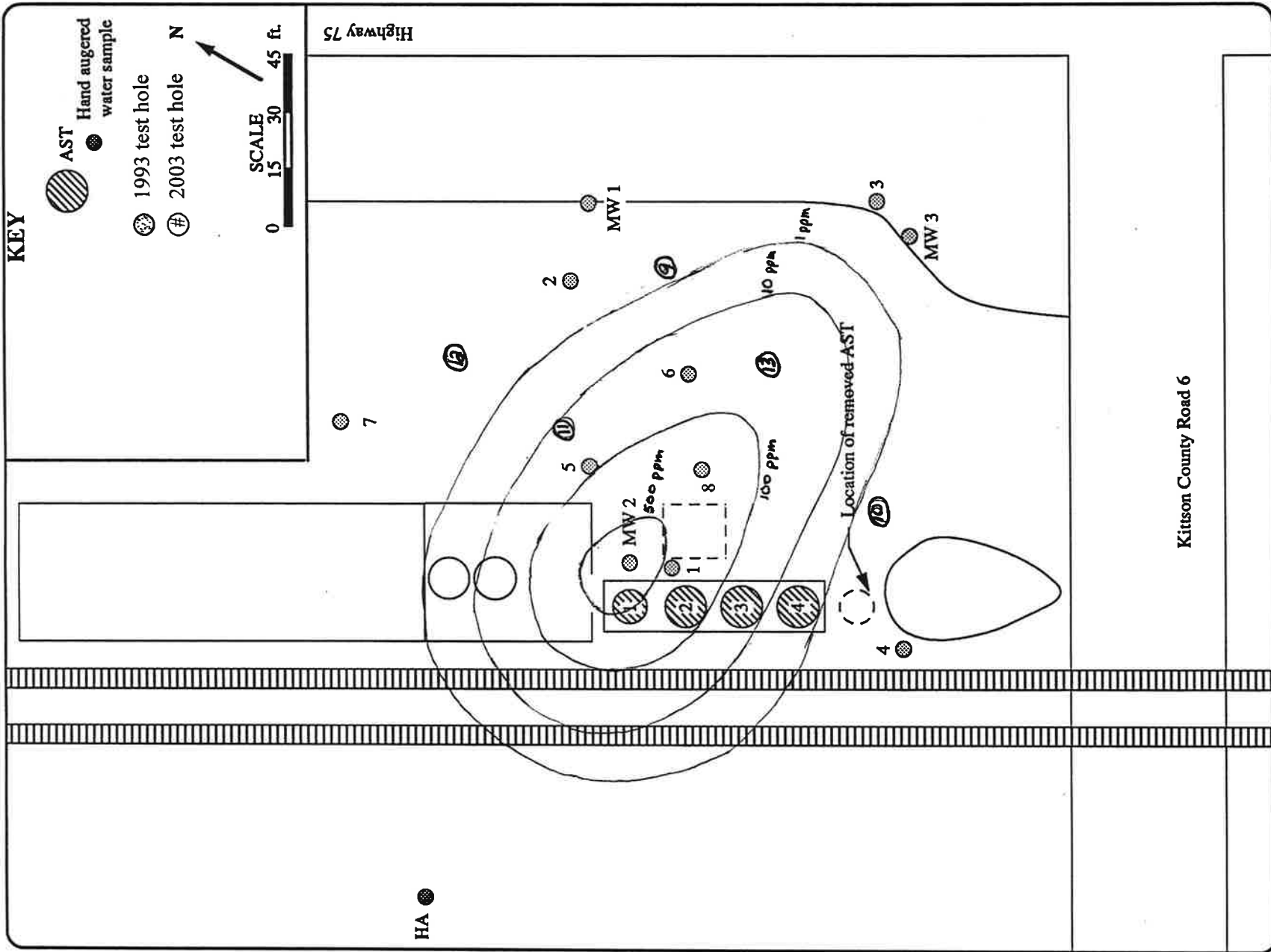
* Sample preserved at a pH of 3.0

** Laboratory control spike not within control limits. Recoveries were between 82-84%

Table 8
Other Contaminants Detected in Water Samples Collected from Wells (Petroleum or Non-petroleum Derived)

Compound	HRL	MW2 05/07/03	Trip Blank 05/07/03
1,2-Dichloroethane		23	<1.0
n-Butylbenzene		75	<1.0
sec-Butylbenzene		13	<1.0
Isopropylbenzene	300	14	<1.0
p-Isopropyltoluene		9.5	<1.0
n-Propylbenzene		14	<1.0
Naphthalene	300	60	<2.0
Tetrahydrofuran		57	<2.0
1,2,4-Trimethylbenzene		34	<1.0
1,3,5-Trimethylbenzene		18	<1.0

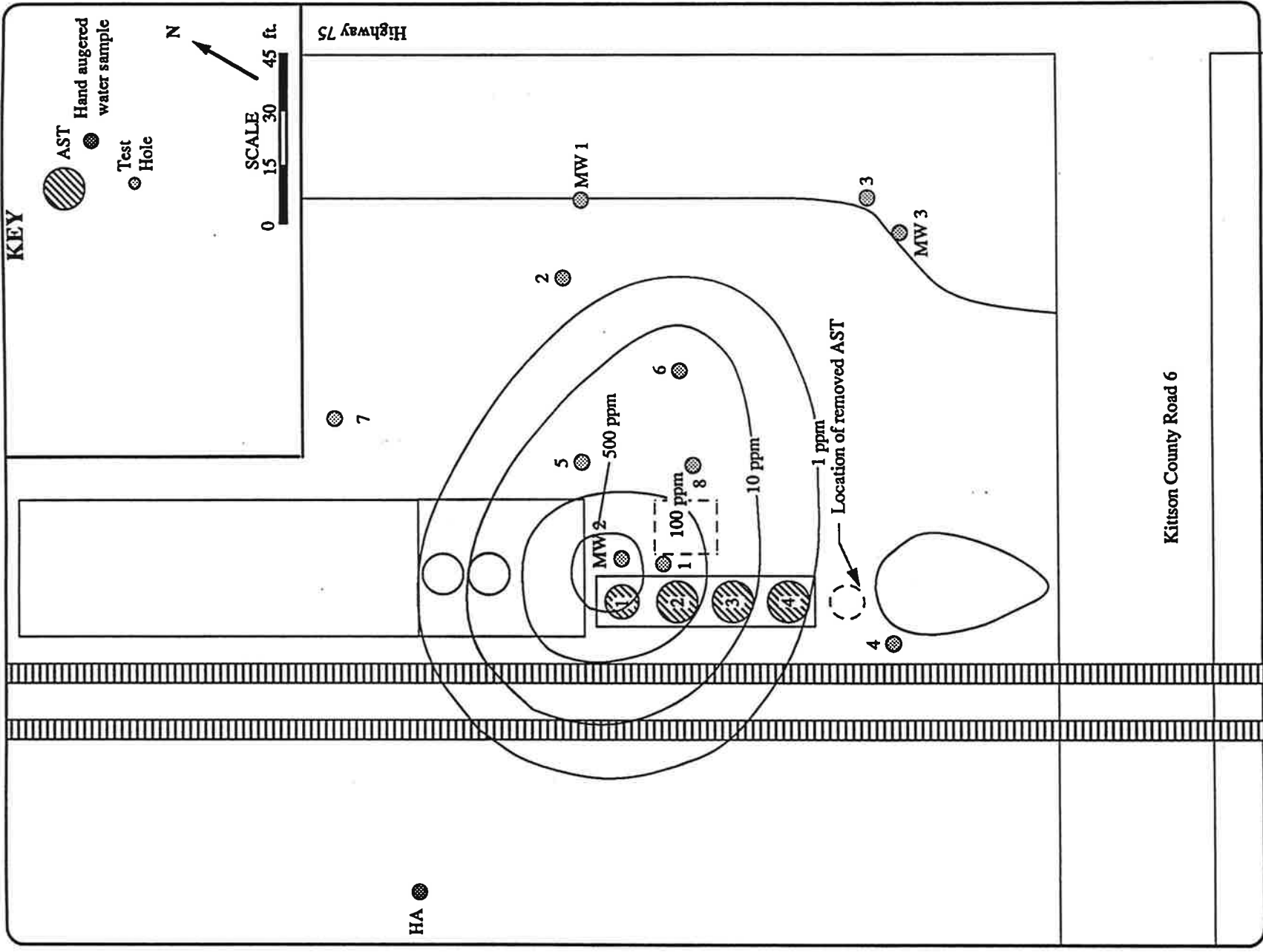
Notes: Results reported in ppb.



WEST CENTRAL ENVIRONMENTAL CONSULTANTS

PROJECT No. 92-405-30 Humboldt Bulk

Figure 2a: 2003 Conceptualized Contamination Plume



WEST CENTRAL ENVIRONMENTAL CONSULTANTS
PROJECT No. 92-405-30 Humboldt Bulk
 Figure 2b: 1993 Conceptualized Contamination Plume

WCEC SOIL BORING LOG

LEAK NUMBER: 5361 BORING #: 9
 PROJECT NUMBER: 405 DATE: 05/20/03
 PROJECT NAME: Humboldt Bulk TIME -start: 11:40 AM
 DRILLER: WCEC -end: 12:30 PM
 DRILLING METHOD: Geoprobe SURFACE ELEVATION:

BENCHMARK:

Depth (feet)	Sampling Information				ASTM Symbol	Material Description	Geologic Origin	WL	PID (ppm)	Sample Analysis
	T	A	R	N						
0					Gravel					
5					ML-CL Silty Clay w/ some organics, black, wet	lacustrine		0		
					CL Silty Clay, moderate yellowish/brown, wet w/ light olive gray silty layers	lacustrine		0		LS
10					CL Silty Clay, moderate yellowish/brown, wet w/ light olive gray silty layers	lacustrine		0		
15										
20										
25										

Water Level Measurements

Date	Time	Elapsed Time	Water Level	Product Level

Comments:
 - Depth to water was 8.2' after pumping.
 - Ice crystals in samples after 5'.
 - 15' screen in hole.

KEY

Sampling Info:
 T = sample type
 A = attempt
 R = recovery
 B = blow count
 N = N value

Definitions:
 WL = Water Level
 Elapsed time = time between end of drilling & sampling.

Sample Types:
 SS = split spoon
 GS = grab sample
 HA = hand auger
 LB = large bore
 MS = macro

Analysis:
 LS = lab soil sample
 LW = lab water sample



WCEC SOIL BORING LOG

BORING #: 10
 DATE: 05/20/03
 TIME -start: 12:30 PM
 -end: 01:15 PM
 SURFACE ELEVATION:

LEAK NUMBER: 5361
 PROJECT NUMBER: 405
 PROJECT NAME: Humboldt Bulk
 DRILLER: WCEC
 DRILLING METHOD: Geoprobe
 BENCHMARK:

Depth (feet)	Sampling Information				ASTM Symbol	Material Description	Geologic Origin	WL	PID (ppm)	Sample Analysis
	T	A	R	N						
0						Gravel				
					ML-CL	Silty Clay, black, wet	lacustrine			
					CL	Silty Clay, moderate yellowish/brown w/ light olive gray silty layers	lacustrine		0	LW
5									0	
					CL	Silty Clay, moderate yellowish/brown w/ light olive gray silty layers, water bearing	lacustrine		0	LS
10									0	
					CL	Silty Clay, moderate yellowish/brown w/ light olive gray silty layers	lacustrine			
15									0	
20										
25										

Water Level Measurements			
Date	Time	Water Level	Product Level
05/20/03	01:15 PM	3.0'	

KEY

Sample Types:
 SS = split spoon
 GS = grab sample
 HA = hand auger
 LB = large bore
 MS = macro

Analysis:
 LS = lab soil sample
 LW = lab water sample

Sampling Info:
 T = sample type
 A = attempt
 R = recovery
 B = blow count
 N = N value

Definitions:
 WL = Water Level
 Elapsed time = time between end of drilling & sampling.

Comments:
 - Ice crystals at 6'-8'.
 - 10' screen in hole.

screened interval for temporary well

WCEC SOIL BORING LOG

BORING #: 11
 DATE: 05/20/03
 TIME-start: 01:20 PM
 -end: 03:30 PM

LEAK NUMBER: 5361
 PROJECT NUMBER: 405
 PROJECT NAME: Humboldt Bulk
 DRILLER: WCEC

DRILLING METHOD: Geoprobe
 BENCHMARK: SURFACE ELEVATION:

Depth (feet)	Sampling Information			ASTM Symbol	Material Description	Geologic Origin	WL	PID (ppm)	Sample Analysis
	T	A	N						
0					Gravel				
					Gravelly fill	Fill			
MS				ML-CL	Silty clay, black, wet	lacustrine		0	
5				ML-CL	Silty clay, light olive gray, wet Slight petroleum odor.	lacustrine		0.2	
MS					Silty clay, olive gray, wet Slight petroleum odor.	lacustrine		1.9	LS
10								12.2	
								8.8	
					Silty clay, wet, changes to moderate olive brown @ 11.5'	lacustrine		0	
				CH	Lean clay olive gray, w/ light olive gray silt seams, w/lite olive gray mottles, wet.	lacustrine			
MS					Clay, olive gray, wet			0	
					small 1" coarse sand lense				
MS									
20									
25				CH	Clay, olive gray, wet				

Water Level Measurements		
Date	Time	Water Level
05/21/03	09:30 AM	11.1

Sample Types:
SS = split spoon
GS = grab sample
HA = hand auger
LB = large bore
MS = macro
Analysis:
WL = Water Level
LS = lab soil sample
LW = lab water sample

Sampling Info:
T = sample type
A = attempt
R = recovery
B = blow count
N = N value
Definitions:
WL = Water Level
Elapsed time = time between end of drilling & sampling.

Comments:
 - Some ice crystals below 5'.
 - 20' screen in hole.

WCEC SOIL BORING LOG (cont)

LEAK NUMBER: 5361
 PROJECT NUMBER: 405
 PROJECT NAME: Humboldt Bulk

BORING #: 11
 DATE: 05/20/03

Depth (feet)	Sampling Information			ASTM Symbol	Material Description	Geologic Origin	WL	PID (ppm)	Sample Analysis
	T	A	R						
25				CH	Fat clay, olive gray, wet			0	
30				CH	Fat clay, olive gray, wet			0	LS
35									
40									
45									
50									

Comments:

KEY

Sampling Info:
 T = sample type
 A = attempt
 R = recovery
 B = blow count
 N = N value

Definitions:
 WL = Water Level
 Elapsed time = time from end of drilling period to sampling-time.

Sample Types:
 SS = split spoon
 GS = grab sample
 HA = hand auger
 LB = large bore
 MS = macro sampler

Analysis:
 LS = lab soil sample
 LW = lab water sample

WCEC SOIL BORING LOG

LEAK NUMBER: 5361 BORING #: 12
 PROJECT NUMBER: 405 DATE: 05/20/03
 PROJECT NAME: Humboldt Bulk TIME -start: 03:35 PM
 DRILLER: WCEC -end: 04:15 PM
 DRILLING METHOD: Geoprobe SURFACE ELEVATION:

Depth (feet)	Sampling Information				ASTM Symbol	Material Description	Geologic Origin	WL	PID (ppm)	Sample Analysis
	T	A	R	N						
0					Gravel	Fill				
					Gravel rich fill					
					Silty clay, black, moist to wet	ML-CL			0	
5					Silty clay, wet, w/ light olive gray silty layers	ML-CL				
					Clay, moderate olive brown					
					Silty clay, wet, w/ light olive gray silty layers	ML-CL				
10					Clay, moderate olive brown					
15										
20										
25										

Water Level Measurements		
Date	Time	Product Level
05/21/03	08:30 AM	2.4

Comments:
 - Ice crystals at 6'-7'.
 - 15' screen in hole.

KEY

Sampling Info:
 T = sample type
 A = attempt
 R = recovery
 B = blow count
 N = N value

Definitions:
 WL = Water Level
 Elapsed time = time between end of drilling & sampling.

Sample Types:
 SS = split spoon
 GS = grab sample
 HA = hand auger
 LB = large bore
 MS = macro

Analysis:
 LS = lab soil sample
 LW = lab water sample

WCEC SOIL BORING LOG

LEAK NUMBER: 5361
 PROJECT NUMBER: 405
 PROJECT NAME: Humboldt Bulk
 DRILLER: WCEC
 DRILLING METHOD: Geoprobe
 BENCHMARK:

BORING #: 13
 DATE: 05/20/03
 TIME -start: 04:30 PM
 -end:
 SURFACE ELEVATION:

Depth (feet)	Sampling Information				ASTM Symbol	Material Description	Geologic Origin	WL	PID (ppm)	Sample Analysis
	T	A	R	B						
0						Gravel	Fill			
						Gravelly clay fill				
	MS				ML	Silty clay, light olive gray, moist to wet	lacustrine		0	
5					ML	Silt, light olive gray, w/ moderate olive brown mottles, wet	lacustrine			
	MS				ML-CL	Silty clay, olive gray w/ moderate light olive brown, wet, Petroleum odor, dash gray streaks	lacustrine		4.5	LS
10									52.8	
	MS					Silty clay, moderate olive brown, wet	lacustrine		30	
	MS				ML-CL		lacustrine		0	
15						Silty clay, moderate yellowish/brown clay w/ light olive gray silt, wet	lacustrine		0	
	MS									
	MS					Silty clay, moderate yellowish/brown clay w/ light olive gray silt, wet			0	
20					CH	Clay, olive gray, waterbearing				
	MS									
25										

Water Level Measurements		
Date	Time	Product Level
		Water Level 3'

KEY

Sample Types:
 SS = split spoon
 GS = grab sample
 HA = hand auger
 LB = large bore
 MS = macro

Sampling Info:
 T = sample type
 A = attempt
 R = recovery
 B = blow count
 N = N value

Definitions:
 WL = Water Level
 Elapsed time = time between end of drilling & sampling.

Analysis:
 LS = lab soil sample
 LW = lab water sample

Comments:
 - Screened to 15'.
