MPS ENGINEERS

1444 Illinois Street
Des Moines, Iowa 50314
Phone 515-221-9832 Fax 515-222-2625
www.mpsengineers.com Email: mps_engineers@hotmail.com

CON 12-15
Doc # 27746

November 14, 2012

Mr. Jim Kacer
Iowa Department of Natural Resources
Contaminated Sites Section
Wallace State Office Building
Des Moines, Iowa 50319

RE: SITE MONITORING RESULTS
AL'S CORNER OIL COMPANY
12053 HIGHWAY 71
CARROLL, IOWA

Dear Mr. Kacer:

MPS Engineers is enclosing with this letter, results of groundwater sampling at the above-referenced site.

As you will notice, all groundwater concentration with the exception of MW-8 have shown declining trend. The benzene plume appears to be confined to the subject site. We are requesting a closure for groundwater sampling activities at this site.

If you need additional information, please contact our office at (515) 221-9832.

Sincerely,
MPS ENGINEERS

Amit A. Pradhan, PE
Environmental Engineer

Cc: Rollin Tiefenthaler, Al's Corner Oil Company
File #1516

MPS ENGINEERS

1444 Illinois Street
Des Moines, Iowa 50314
Phone 515-221-9832 Fax 515-222-2625
www.mpsengineers.com Email: mps_engineers@hotmail.com

November 9, 2012

Mr. Jim Kacer
Iowa Department of Natural Resources
Contaminated Sites Section
Wallace State Office Building
Des Moines, Iowa 50319

RE: SITE MONITORING RESULTS
AL'S CORNER OIL COMPANY
12053 HIGHWAY 71
CARROLL, IOWA

Dear Mr. Kacer:

MPS Engineers is enclosing with this letter results of groundwater sampling at the above-referenced site.

SITE ACTIVITIES

Groundwater sampling was conducted at this site on October 16, 2012. The following monitoring wells were sampled during this sampling event: MW-1, MW-4, MW-6, MW-7, MW-19N, MW-201, MW-8, and MW-10. Results of Groundwater sampling have been tabulated on the attached spread sheet.

DATA ANALYSIS

Groundwater Contamination Plume Maps and Groundwater Flow Direction Maps were developed based upon the results of this sampling event. These maps and laboratory data sheets are provided as attachment to this letter.

If you need additional information, please contact our office at (515) 221-9832.

Sincerely,
MPS ENGINEERS

Amit A. Pradhan, PE
Environmental Engineer

Cc: Rollin Tiefenthaler, Al's Corner Oil Company
File #1516

GROUNDWATER DATA TABULATION

AL'S CORNER OIL COMPANY
12053 HIGHWAY 71, CARROLL, IOWA

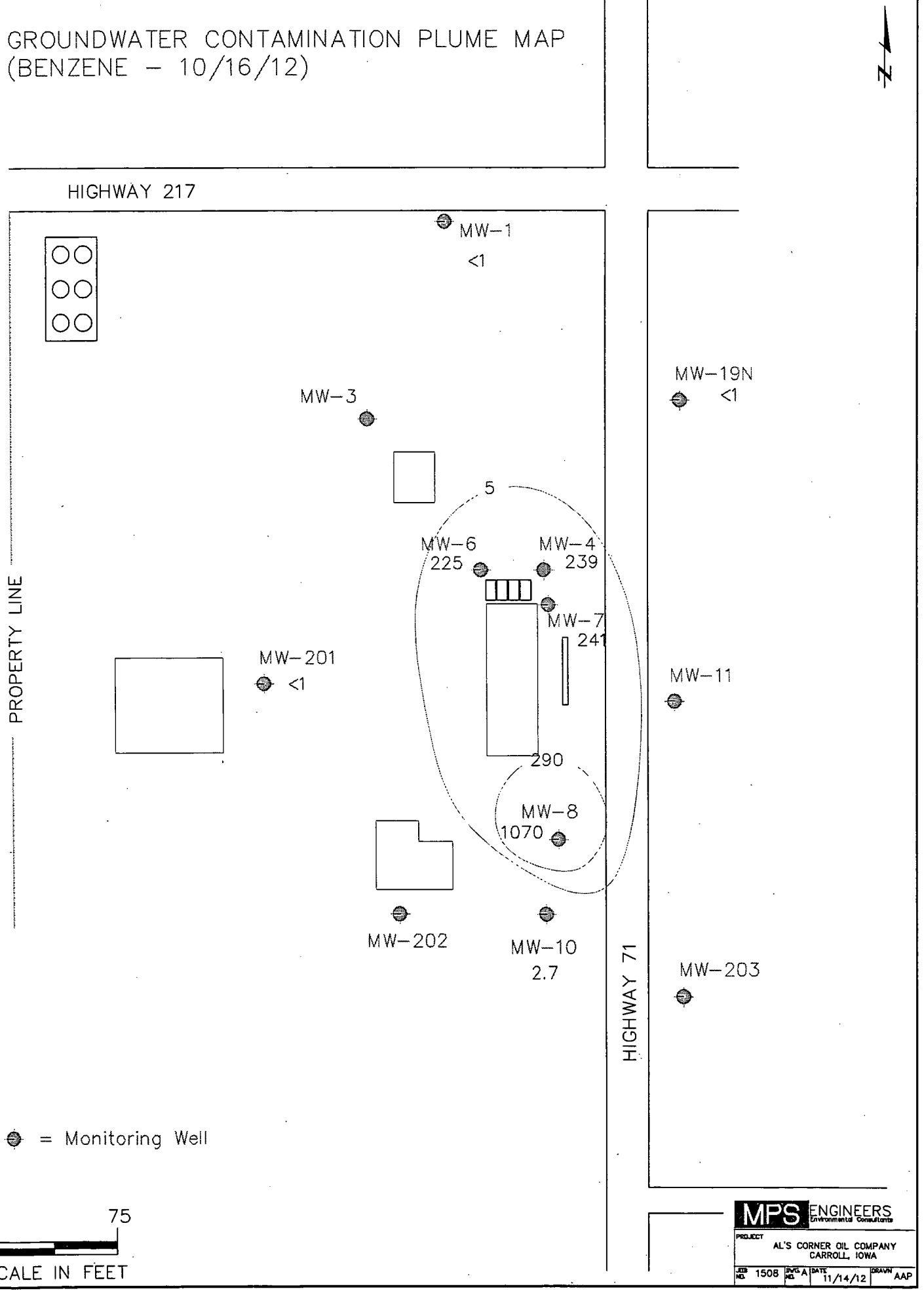
Monitoring Well	Sample Date	Ground Elevation	Top of Screen Elevation	GW Elevation	Benzene ug/L	Tolune ug/L	Ethylbenz ug/L	Xylene ug/L	TEH-D ug/L	TEH-WO ug/L
MW-1	9/23/1994	1268.47	1266.24	1265.31	4	26	12	17	400	NA
MW-1	3/14/2006	1268.47	1266.24	1268.47	<1	<1	<1	<2	<100	<100
MW-1	4/10/2008	1268.47	1266.24	1266.06	<4	6	<4	<8	<100	<100
MW-1	10/21/2008	1268.47	1266.24	1266.05	<1	1.1	<1	<2	<100	<100
MW-1	6/12/2009	1268.47	1266.24	1266.12	<1	<1	15.2	<2	N	N
MW-1	9/2/2009	1268.47	1266.24	1265.46	<1	<1	<1	<2	N	N
MW-1	3/18/2010	1268.47	1266.24	1268.32	<1	<1	<1	<2	N	N
MW-1	9/21/2010	1268.47	1266.24	1264.99	<1	<1	<1	<2	N	N
MW-1	2/28/2011	1268.47	1266.24	1265.52	18.8	2.2	<1.0	<2	N	N
MW-1	10/27/2011	1268.47	1266.24	1264.73	<2	2.9	<2	<4	N	N
MW-1	3/5/2012	1268.47	1266.24	1265.21	<1	<1	<1	<2	N	N
MW-1	10/16/2012	1268.47	1266.24	1264.13	<1	<1	<1	<2	N	N
MW-4	9/23/1994	1273.09	1273.54	1268.62	2500	1340	360	1890	5000	NA
MW-4	3/14/2006	1273.09	1273.54	1273.09	1510	<5	189	532	2200	<100
MW-4	9/7/2006	1273.09	1273.54	1273.28	1950	26	200	950	2300	<100
MW-4	4/12/2007	1273.09	1273.54	1267.40	1590	59	218	532	2000	200
MW-4	11/26/2007	1273.09	1273.54	1270.11	2350	26	255	1070	<100	<100
MW-4	4/10/2008	1273.09	1273.54	1267.31	5210	2550	757	3470	<100	<100
MW-4	10/21/2008	1273.09	1273.54	1267.79	3090	343	400	1420	1200	<100
MW-4	6/12/2009	1273.09	1273.54	1267.8	1110	221	204	837	N	N
MW-4	9/2/2009	1273.09	1273.54	1267.77	173	20.1	70.7	259	N	N
MW-4	3/18/2010	1273.09	1273.54	1267.88	867	14.1	174	278	N	N
MW-4	9/21/2010	1273.09	1273.54	1266.96	1140	10	146	189	N	N
MW-4	2/28/2011	1273.09	1273.54	1267.51	3650	<10	627	1170	N	N
MW-4	10/27/2011	1273.09	1273.54	1267.12	1510	9	186	574	N	N
MW-4	10/27/2011	1273.09	1273.54	1266.24	305	21.3	166	269	N	N
MW-4	10/16/2012	1273.09	1273.54	1265.38	239	2.2	38.4	73.7	N	N
MW-6	9/23/1994	1274.10	1274.24	1269.34	2850	1040	484	5250	13600	NA
MW-6	3/14/2006	1274.10	1274.24	1274.10	168	<5	84.00	23	1300	<100
MW-6	9/7/2006	1274.10	1274.24	1273.84	177	3	23	4	1200	<100
MW-6	4/12/2007	1274.10	1274.24	1268.96	61	<2	9	6	400	<100
MW-6	11/26/2007	1274.10	1274.24	1269.71	1340	24	344	1010	2400	<100
MW-6	4/10/2008	1274.10	1274.24	1269.35	1310	85	587	1340	<100	<100
MW-6	10/21/2008	1274.1	1274.24	1269.5	4300	185	1010	4050	3600	<100
MW-6	6/12/2009	1274.10	1274.24	1269.43	2050	14.6	289	310	N	N
MW-6	9/2/2009	1274.10	1274.24	1269.18	734	7.2	324	263	N	N
MW-6	3/18/2010	1274.1	1274.24	1268.47	1130	20.8	176	199	N	N
MW-6	9/21/2010	1274.1	1274.24	1268.65	2040	1400	603	939	N	N
MW-6	2/28/2011	1274.1	1274.24	1268.55	193	<5	247	195	N	N
MW-6	10/27/2011	1274.1	1274.24	1268.04	1430	10	159	497	N	N

MW-6	3/5/2012	1274.1	1274.24	1267.97	254	20.8	128	203	N	N
MW-6	10/16/2012	1274.1	1274.24	1266.81	225	2	35	64.3	N	N
MW-7	9/23/1994	1274.71	1274.44	1268.83	533	611	112	835	1500	NA
MW-7	3/14/2006	1274.71	1274.44		223	32	21	64	600	<100
MW-7	9/7/2006	1274.71	1274.44	1273.51	2220	89	202	1050	<100	400
MW-7	4/12/2007	1274.71	1274.44	1268.29	901	14	70	24	<100	<100
MW-7	11/26/2007	1274.71	1274.44	1270.03	2410	31	267	1110	<100	<100
MW-7	4/10/2008	1274.71	1274.44	1268.44	1600	315	129	304	<100	<100
MW-7	10/21/2008	1274.71	1274.44	1268.81	4020	71.9	543	2630	700	<100
MW-7	6/12/2009	1274.71	1274.44	1268.72	2340	35.3	249	1250	N	N
MW-7	9/2/2009	1274.71	1274.44	1268.38	2040	36.4	283	1010	N	N
MW-7	3/18/2010	1274.71	1274.44	1268.8	944	17.1	175	257	N	N
MW-7	9/21/2010	1274.71	1274.44	1268.15	2820	23	409	1610	N	N
MW-7	2/28/2011	1274.71	1274.44	1268.09	209	<5	35.5	48.8	N	N
MW-7	10/27/2011	1274.71	1274.44	1267.77	1250	10.4	121	390	N	N
MW-7	3/5/2012	1274.71	1274.44	1267.41	264	23.9	133	214	N	N
MW-7	10/16/2012	1274.71	1274.44	1266.93	241	2.2	38.6	71.6	N	N
MW-8	9/23/1994	1275.87	1272.36	1268.95	1530	970	270	1930	3100	NA
MW-8	3/14/2006	1275.87	1272.36	1275.87	5320	1770	1850	8080	4200	<100
MW-8	9/7/2006	1275.87	1272.36	1275.29	3230	246	1260	4760	7800	<100
MW-8	4/12/2007	1275.87	1272.36	1268.71	<2	<2	<2	22	<100	<100
MW-8	11/26/2007	1275.87	1272.36	1270.61	2140	99	643	2730	4900	<100
MW-8	4/10/2008	1275.87	1272.36	1269.12	270	9	32	390	<100	<100
MW-8	10/21/2008	1275.87	1272.36	1267.02	658	18.8	134	430	1600	<100
MW-8	6/12/2009	1275.87	1272.36	1267.32	437	10.1	774	1980	N	N
MW-8	9/2/2009	1275.87	1272.36	1267.14	608	60.1	1030	3070	N	N
MW-8	3/18/2010	1275.87	1272.36	1271	<1	<1	1.7	2.5	N	N
MW-8	9/21/2010	1275.87	1272.36	1266.33	250	42	544	1110	N	N
MW-8	2/28/2011	1275.87	1272.36	1267.71	7.7	<5	77.7	178	N	N
MW-8	10/27/2011	1275.87	1272.36	1267.16	362	55.1	926	2090	N	N
MW-8	3/5/2012	1275.87	1272.36	1266.48	47.9	6.2	80.5	190	N	N
MW-8	10/16/2012	1275.87	1272.36	1265.61	1070	60.5	994	2300	N	N
MW-201	9/7/2006	1275.18	1272.18	1274.29	10	27	3	4	<100	<100
MW-201	4/12/2007	1275.18	1272.18	1270.64	2	1	<1	4	<100	500
MW-201	11/26/2007	1275.18	1272.18	1270.32	1	<1	<1	<2	<100	<100
MW-201	4/10/2008	1275.18	1272.18	1270.77	<5	<5	<5	<10	<100	200
MW-201	10/21/2008	1275.18	1272.18	1270.88	<1	<1	1.1	<2	<100	100
MW-201	6/12/2009	1275.18	1272.18	1271.11	<1	<1	<1	<2	N	N
MW-201	9/2/2009	1275.18	1272.18	1267.31	<1	<1	<1	<2	N	N
MW-201	3/18/2010	1275.18	1272.18	1274.41	1.4	<1	<1	<2	N	N
MW-201	9/21/2010	1275.18	1272.18	1269.15	<1	<1	<1	<2	N	N
MW-201	2/28/2011	1275.18	1272.18	1271.07	<1	<1	<1	<2	N	N
MW-201	10/27/2011	1275.18	1272.18	1270.44	<2	<2	<2	<4	N	N
MW-201	3/5/2012	1275.18	1272.18	1269.13	<1	<1	<1	<2	N	N

MW-201	10/16/2012	1275.18	1272.18	1268.04	<1	<1	<1	<2	N	N
MW-19N	9/7/2006	1274.36	1271.36	1273.16	3	8	11	22	2200	<100
MW-19N	4/12/2007	1274.36	1271.36	1273.07	7	4	3	7	<100	<100
MW-19N	11/26/2007	1274.36	1271.36	1271.22	2	1	3	3	<100	<100
MW-19N	4/10/2008	1274.36	1271.36	1272.21	2	2	3	5	<100	<100
MW-19N	10/21/2008	1274.36	1271.36	1271.51	1.2	2.2	1.8	<2	100	<100
MW-19N	6/12/2009	1274.36	1271.36	1271.7	<1	<1	<1	<2	N	N
MW-19N	9/2/2009	1274.36	1271.36	1271.33	11.5	4.1	4.5	<2	N	N
MW-19N	3/18/2010	1274.36	1271.36	1273.54	7.3	3.3	2.5	2.7	N	N
MW-19N	9/21/2010	1274.36	1271.36	1270.53	<1	<1	<1	<2	N	N
MW-19N	2/28/2011	1274.36	1271.36	1271.33	16.5	1.6	<1	<2	N	N
MW-19N	10/27/2011	1274.36	1271.36	1270.87	15.4	11.9	4.2	5.2	N	N
MW-19N	3/5/2012	1274.36	1271.36	1270.31	<2	<2	<2	<4	N	N
MW-19N	10/16/2012	1274.36	1271.36	1269.25	<1	<1	<1	<2	N	N
MW-10	4/10/2008	1274.43	1271.36	1268.75	6	2	11	53	<100	<100
MW-10	10/21/2008	1274.43	1271.36	1266.81	12.7	2.4	28.2	112	600	<100
MW-10	6/12/2009	1274.43	1271.36	1267.69	11.8	<5	19.9	101	N	N
MW-10	9/2/2009	1274.43	1271.36	1267.18	21.9	4	34.3	137	N	N
MW-10	3/18/2010	1274.43	1271.36	1269.22	<1	<1	1.3	<2	N	N
MW-10	9/21/2010	1274.43	1271.36	1266.34	39	6	68	211	N	N
MW-10	2/28/2011	1274.43	1271.36	1268.39	18.5	<5	24.4	133	N	N
MW-10	10/27/2011	1274.43	1271.36	1267.94	9.2	<5	49.8	201	N	N
MW-10	3/5/2012	1274.43	1271.36	dry	N	N	N	N	N	N
MW-10	10/16/2012	1274.43	1271.36	1267.06	2.7	<1	<1	<2	N	N

GROUNDWATER CONTAMINATION PLUME MAP

GROUNDWATER CONTAMINATION PLUME MAP
(BENZENE – 10/16/12)

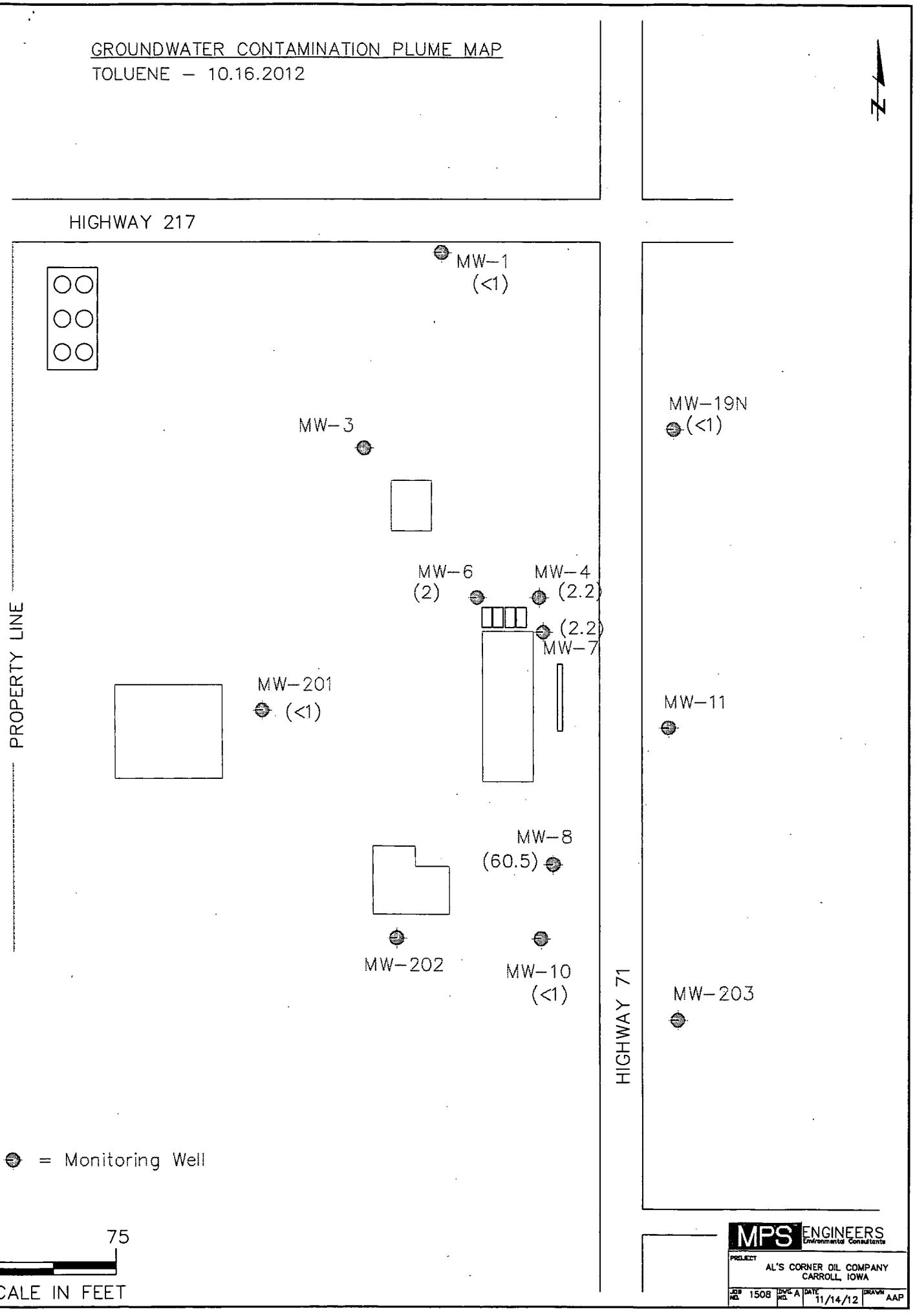


MPS ENGINEERS Environmental Consultants

PROJECT
AL'S CORNER OIL COMPANY
CARROLL, IOWA

JOB NO.	DWG NO.	DATE	DRAWN
1508	A	11/14/12	AAP

GROUNDWATER CONTAMINATION PLUME MAP
TOLUENE – 10.16.2012

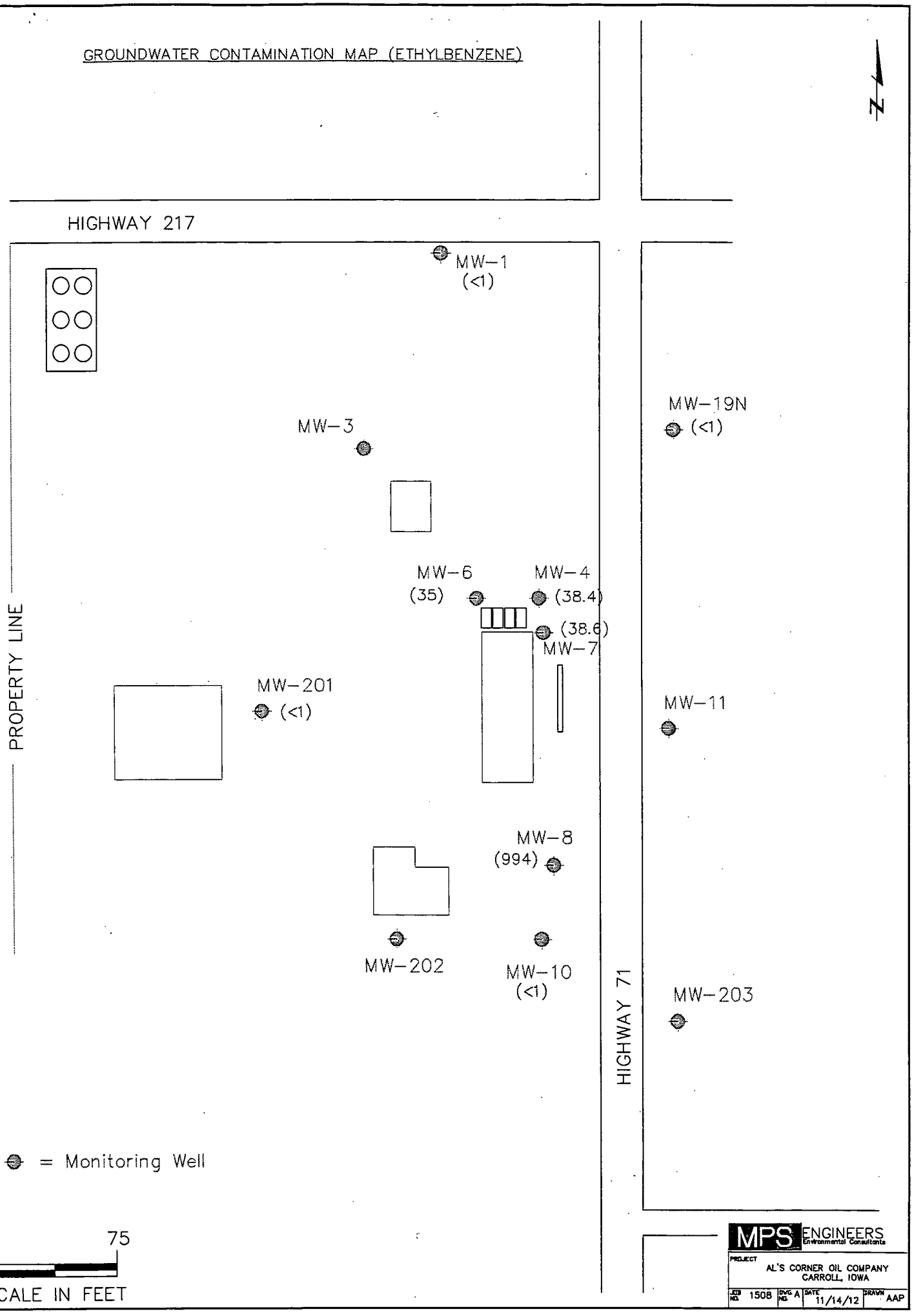


MPS ENGINEERS
Environmental Consultants

PROJECT
AL'S CORNER OIL COMPANY
CARROLL, IOWA

JOB NO.	DWG. NO.	DATE	DRAWN
1508	A	11/14/12	AAP

GROUNDWATER CONTAMINATION MAP (ETHYLBENZENE)



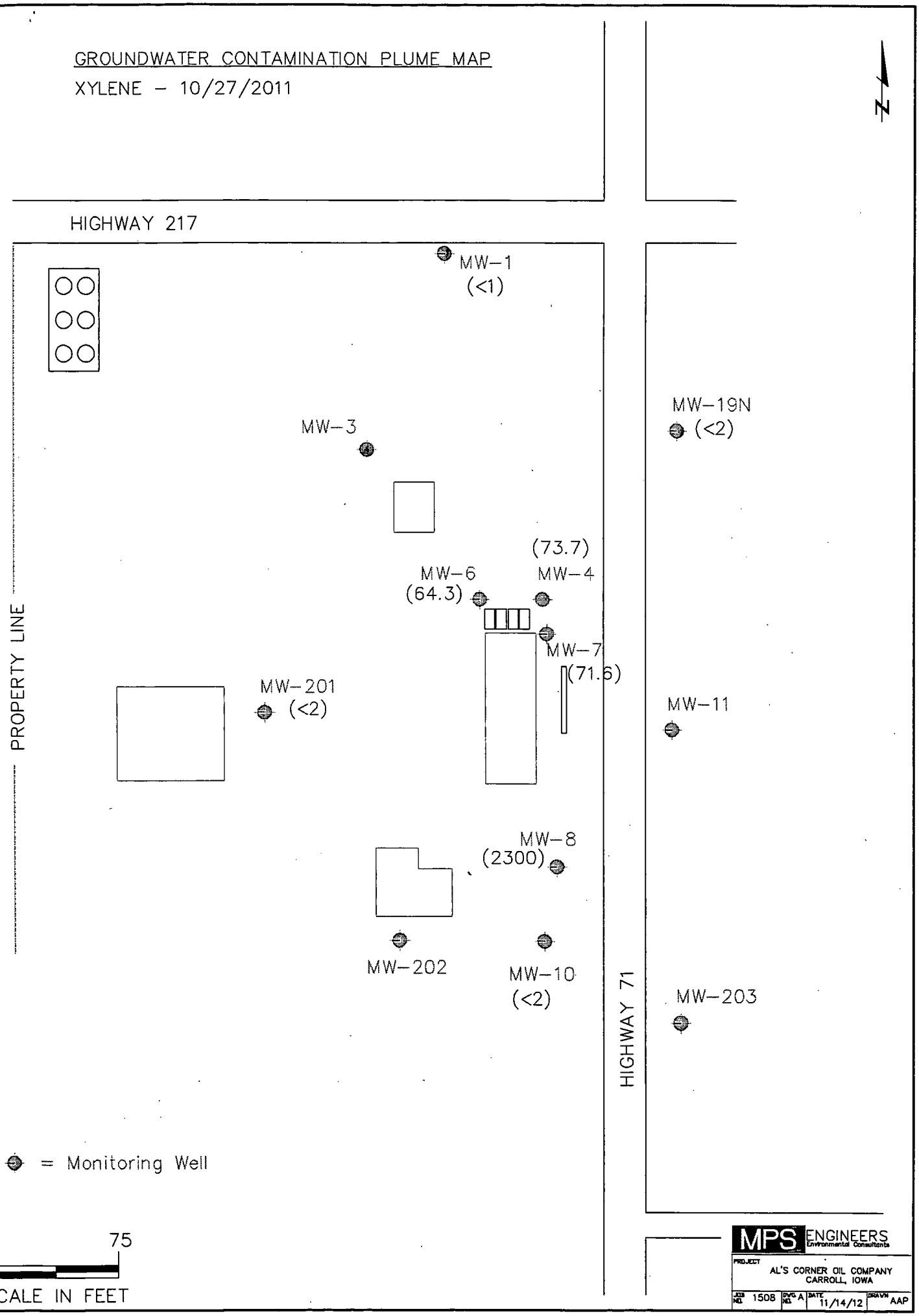
MPS ENGINEERS Environmental Consultants

PROJECT: AL'S CORNER OIL COMPANY
CARROLL, IOWA

JOB NO.	DWG. NO.	DATE	DRAWN
1508	A	11/14/12	AAP

GROUNDWATER CONTAMINATION PLUME MAP

XYLENE – 10/27/2011

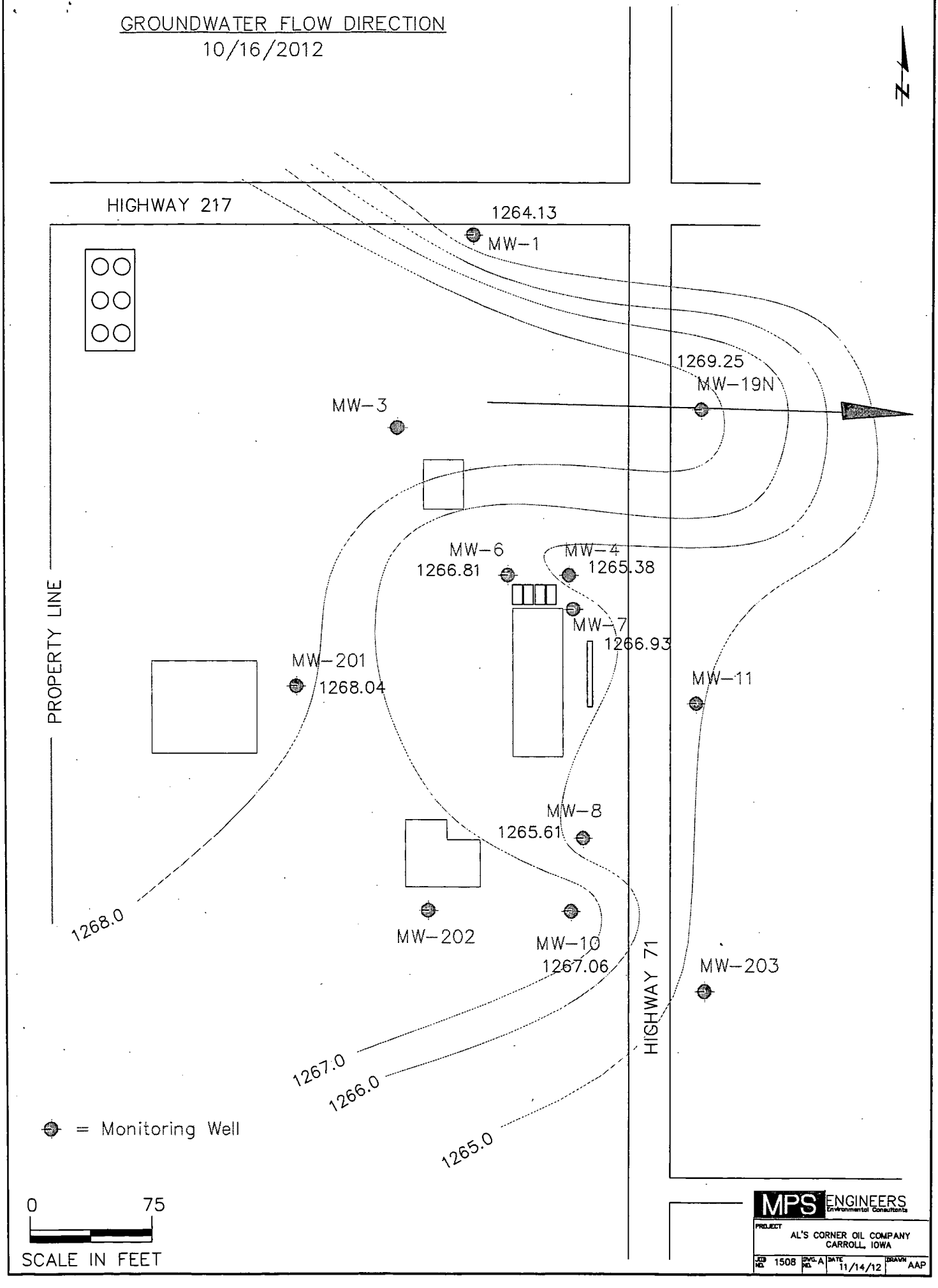


MPS ENGINEERS Environmental Consultants

PROJECT: AL'S CORNER OIL COMPANY
CARROLL, IOWA

JOB NO. 1508 | DWG NO. A | DATE 11/14/12 | DRAWN AAP

GROUNDWATER FLOW DIRECTION MAP


GROUNDWATER FLOW DIRECTION
10/16/2012
N
HIGHWAY 217
1264.13
MW-1
1269.25
MW-19N
MW-3
MW-6
1266.81
MW-4
1265.38
MW-7
1266.93
MW-201
1268.04
MW-11
PROPERTY LINE
MW-8
1265.61
1268.0
MW-202
MW-10
1267.06
MW-203
HIGHWAY 71
1267.0
1266.0
1265.0
= Monitoring Well
0
75
SCALE IN FEET
MPS ENGINEERS
Environmental Consultants
PROJECT
AL'S CORNER OIL COMPANY
CARROLL, IOWA
JOB NO. 1508
DWG. A NO.
DATE 11/14/12
DRAWN AAP

LABORATORY DATA SHEETS

Keystone LABORATORIES, INC.

MEMBER ACIL

ANALYTICAL REPORT

October 31, 2012

Work Order: 1J21117

Report To	Work Order Information
Amit Pradhan	Date Received: 10/18/2012 11:50AM
MPS Engineers	Collector: Wilkinson, Charles
1444 Illinois St.	Phone: (515) 221-9832
Des Moines, IA 50314	PO Number: 1515

Project : UST

Project Number: Als Corner Oil Co - 1515

Analyte	Result	MRL	Batch	Method	Analyst	Analyzed	Qualifier
1J21117-01 MW1				Matrix:Water	Collected: 10/16/12 13:00		
Benzene	<1.0 ug/L	1.0	1VJ0882	Iowa OA-1	TKD	10/26/12 13:31	
Toluene	<1.0 ug/L	1.0	1VJ0882	Iowa OA-1	TKD	10/26/12 13:31	
Ethylbenzene	<1.0 ug/L	1.0	1VJ0882	Iowa OA-1	TKD	10/26/12 13:31	
Xylenes, total	<2.0 ug/L	2.0	1VJ0882	Iowa OA-1	TKD	10/26/12 13:31	
Surrogate: Chlorobenzene	*106 %*			*76-135*	TKD	10/26/12 13:31	
1J21117-02 MW19				Matrix:Water	Collected: 10/16/12 13:15		
Benzene	<1.0 ug/L	1.0	1VJ0882	Iowa OA-1	TKD	10/27/12 1:58	
Toluene	<1.0 ug/L	1.0	1VJ0882	Iowa OA-1	TKD	10/27/12 1:58	
Ethylbenzene	<1.0 ug/L	1.0	1VJ0882	Iowa OA-1	TKD	10/27/12 1:58	
Xylenes, total	<2.0 ug/L	2.0	1VJ0882	Iowa OA-1	TKD	10/27/12 1:58	
Surrogate: Chlorobenzene	*104 %*			*76-135*	TKD	10/27/12 1:58	
1J21117-03 MW10				Matrix:Water	Collected: 10/16/12 13:30		
Benzene	**2.7 ug/L**	**1.0**	1VJ0964	Iowa OA-1	TKD	10/29/12 16:34	
Toluene	<1.0 ug/L	1.0	1VJ0964	Iowa OA-1	TKD	10/29/12 16:34	
Ethylbenzene	**4.8 ug/L**	**1.0**	1VJ0964	Iowa OA-1	TKD	10/29/12 16:34	
Xylenes, total	**27.9 ug/L**	**2.0**	1VJ0964	Iowa OA-1	TKD	10/29/12 16:34	
Surrogate: Chlorobenzene	*105 %*			*76-135*	TKD	10/29/12 16:34	
1J21117-04 MW8				Matrix:Water	Collected: 10/16/12 13:45		
Benzene	**1070 ug/L**	**50.0**	1VJ0882	Iowa OA-1	TKD	10/26/12 19:22	
Toluene	**60.5 ug/L**	**50.0**	1VJ0882	Iowa OA-1	TKD	10/26/12 19:22	
Ethylbenzene	**994 ug/L**	**50.0**	1VJ0882	Iowa OA-1	TKD	10/26/12 19:22	
Xylenes, total	**2300 ug/L**	**100**	1VJ0882	Iowa OA-1	TKD	10/26/12 19:22	
Surrogate: Chlorobenzene	*104 %*			*76-135*	TKD	10/26/12 19:22	
1J21117-05 MW201				Matrix:Water	Collected: 10/16/12 14:00		
Benzene	<1.0 ug/L	1.0	1VJ0882	Iowa OA-1	TKD	10/26/12 20:50	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL= Method Reporting Limit.

MPS Engineers
1444 Illinois St.
Des Moines, IA 50314

Work Order: 1J21117

Analyte		Result	MRL	Batch	Method	Analyst	Analyzed	Qualifier
1J21117-05	MW201				Matrix:Water	Collected: 10/16/12 14:00		
Toluene		<1.0 ug/L	1.0	1VJ0882	Iowa OA-1	TKD	10/26/12 20:50	
Ethylbenzene		<1.0 ug/L	1.0	1VJ0882	Iowa OA-1	TKD	10/26/12 20:50	
Xylenes, total		<2.0 ug/L	2.0	1VJ0882	Iowa OA-1	TKD	10/26/12 20:50	
Surrogate: Chlorobenzene		*105 %*			*76-135*	TKD	10/26/12 20:50	
1J21117-06	MW4				Matrix:Water	Collected: 10/16/12 14:15		
Benzene		**239 ug/L**	**1.0**	1VJ0882	Iowa OA-1	TKD	10/27/12 2:42	
Toluene		**2.2 ug/L**	**1.0**	1VJ0882	Iowa OA-1	TKD	10/27/12 2:42	
Ethylbenzene		**38.4 ug/L**	**1.0**	1VJ0882	Iowa OA-1	TKD	10/27/12 2:42	
Xylenes, total		**73.7 ug/L**	**2.0**	1VJ0882	Iowa OA-1	TKD	10/27/12 2:42	
Surrogate: Chlorobenzene		*98.0 %*			*76-135*	TKD	10/27/12 2:42	
1J21117-07	MW6				Matrix:Water	Collected: 10/16/12 14:30		
Benzene		**225 ug/L**	**1.0**	1VJ0882	Iowa OA-1	TKD	10/27/12 3:26	
Toluene		**2.0 ug/L**	**1.0**	1VJ0882	Iowa OA-1	TKD	10/27/12 3:26	
Ethylbenzene		**35.0 ug/L**	**1.0**	1VJ0882	Iowa OA-1	TKD	10/27/12 3:26	
Xylenes, total		**64.3 ug/L**	**2.0**	1VJ0882	Iowa OA-1	TKD	10/27/12 3:26	
Surrogate: Chlorobenzene		*104 %*			*76-135*	TKD	10/27/12 3:26	
1J21117-08	MW7				Matrix:Water	Collected: 10/16/12 14:45		
Benzene		**241 ug/L**	**1.0**	1VJ0882	Iowa OA-1	TKD	10/27/12 4:10	
Toluene		**2.2 ug/L**	**1.0**	1VJ0882	Iowa OA-1	TKD	10/27/12 4:10	
Ethylbenzene		**38.6 ug/L**	**1.0**	1VJ0882	Iowa OA-1	TKD	10/27/12 4:10	
Xylenes, total		**71.6 ug/L**	**2.0**	1VJ0882	Iowa OA-1	TKD	10/27/12 4:10	
Surrogate: Chlorobenzene		*104 %*			*76-135*	TKD	10/27/12 4:10	

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Determination of Volatile Petroleum Hydrocarbons - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1VJ0882 - EPA 5030B										
Blank (1VJ0882-BLK1)				Prepared & Analyzed: 10/26/12						
Surrogate: Chlorobenzene	*123*		*ug L*	*118.000*		*105*	*76-135*			
Benzene	ND	1.0	"							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	2.0	"							
LCS (1VJ0882-BS1)				Prepared & Analyzed: 10/26/12						
Surrogate: Chlorobenzene	*123*		*ug L*	*118.000*		*104*	*70-130*			
Benzene	104.5	1.0	"	103.100		101	68-142			
Toluene	107.1	1.0	"	100.900		106	75-126			
Ethylbenzene	103.6	1.0	"	105.800		97.9	67-143			
Xylenes, total	205.5	2.0	"	216.100		95.1	69-147			
Matrix Spike (1VJ0882-MS1)	**Source: 1J21117-01**			Prepared & Analyzed: 10/26/12						
Surrogate: Chlorobenzene	*132*		*ug L*	*118.000*		*112*	*70-130*			
Benzene	1044	10.0	"	1031.00	ND	101	67-140			
Toluene	1059	10.0	"	1009.00	ND	105	73-129			
Ethylbenzene	1033	10.0	"	1058.00	ND	97.6	68-137			
Xylenes, total	2019	20.0	"	2161.00	ND	93.4	71-145			
Matrix Spike Dup (1VJ0882-MSD1)	**Source: 1J21117-01**			Prepared & Analyzed: 10/26/12						
Surrogate: Chlorobenzene	*122*		*ug L*	*118.000*		*103*	*70-130*			
Benzene	1009	10.0	"	1031.00	ND	97.9	67-140	3.32	17	
Toluene	1051	10.0	"	1009.00	ND	104	73-129	0.806	17	
Ethylbenzene	1026	10.0	"	1058.00	ND	97.0	68-137	0.670	15	
Xylenes, total	1870	20.0	"	2161.00	ND	86.5	71-145	7.69	17	

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Determination of Volatile Petroleum Hydrocarbons - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1VJ0964 - EPA 5030B										
Blank (1VJ0964-BLK1)				Prepared & Analyzed: 10/29/12						
Surrogate: Chlorobenzene	*125*		*ug L*	*118.000*		*106*	*76-135*			
Benzene	ND	1.0	"							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	2.0	"							
LCS (1VJ0964-BS1)				Prepared & Analyzed: 10/29/12						
Surrogate: Chlorobenzene	*121*		*ug L*	*118.000*		*102*	*70-130*			
Benzene	105.9	1.0	"	103.100		103	68-142			
Toluene	113.5	1.0	"	100.900		112	75-126			
Ethylbenzene	113.5	1.0	"	105.800		107	67-143			
Xylenes, total	227.8	2.0	"	216.100		105	69-147			
LCS (1VJ0964-BS2)				Prepared & Analyzed: 10/29/12						
Surrogate: Chlorobenzene	*118*		*ug L*	*118.000*		*100*	*70-130*			
LCS Dup (1VJ0964-BSD2)				Prepared & Analyzed: 10/29/12						
Surrogate: Chlorobenzene	*121*		*ug L*	*118.000*		*103*	*70-130*			
Matrix Spike (1VJ0964-MS1)		**Source: 1J21117-03**		Prepared & Analyzed: 10/29/12						
Surrogate: Chlorobenzene	*120*		*ug L*	*118.000*		*102*	*70-130*			
Benzene	2107	20.0	"	2062.00	2.7	102	67-140			
Toluene	2246	20.0	"	2018.00	ND	111	73-129			
Ethylbenzene	2255	20.0	"	2116.00	4.8	106	68-137			
Xylenes, total	4515	40.0	"	4322.00	27.9	104	71-145			
Matrix Spike Dup (1VJ0964-MSD1)		**Source: 1J21117-03**		Prepared & Analyzed: 10/29/12						
Surrogate: Chlorobenzene	*119*		*ug L*	*118.000*		*101*	*70-130*			
Benzene	2187	20.0	"	2062.00	2.7	106	67-140	3.72	17	
Toluene	2235	20.0	"	2018.00	ND	111	73-129	0.498	17	
Ethylbenzene	2167	20.0	"	2116.00	4.8	102	68-137	4.00	15	
Xylenes, total	4601	40.0	"	4322.00	27.9	106	71-145	1.87	17	

ND = Non Detect; REC= Recovery; RPD= Relative Percent Difference

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Certified Analyses included in this Report

Method/Matrix	Analyte	Certifications
Iowa OA-1 in Water		
	Benzene	SIA1X
	Toluene	SIA1X
	Ethylbenzene	SIA1X
	Xylenes, total	SIA1X

Code	Description	Number	Expires
KS-KC	Kansas Department of Health and Environment-KC	E-10110	04/30/2013
KS-NT	Kansas Department of Health and Environment	E-10287	10/30/2013
MO-KC	Missouri Department of Natural Resources	140	04/30/2013
NELAC	New Jersey Department of Environmental Protection	IA001	06/30/2013
SIA1X	Iowa Department of Natural Resources	95	02/01/2014

End of Report

Sue Thompson

Keystone Laboratories, Inc.

Sue Thompson
Project Manager II

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