



November 19, 2003

Ms. Jessica Montana  
Environmental Specialist  
Iowa Department of Natural Resources  
Contaminated Sites Section  
Wallace State Office Building  
Des Moines, IA 50319

**RE: Site Monitoring Report for Eastgate Oil  
Burlington Northern Santa Fe Railway Company Lease 230,568  
West Jefferson and South Vale Street, Osceola, Iowa**

Dear Ms. Montana,

EMR, Inc. (EMR), on behalf of the Burlington Northern and Santa Fe Railway Company (BNSF), is providing the Iowa Department of Natural Resources (IDNR) with a Site Monitoring Report for the BNSF former Eastgate Oil leased property at the intersection of West Jefferson and South Vale Streets in Osceola, Iowa. A Tier 1 report was submitted to the IDNR in May of 2002 suggesting "No Action Required" however additional monitoring was requested by the IDNR in a September 2003 correspondence.

This report summarizes monitoring data collected since the Tier 1 report submitted in 2002. During preparation of the Tier 1 report, only the Groundwater to potential plastic water line was complete and above the Tier 1 limits. Notification to the local water authority was conducted and submitted in the Tier 1 report.

Groundwater flow continues to be predominantly in the northwesterly direction from the site. Monitoring Wells MW-5 and MW-6 are located down gradient from the suspect source location. Groundwater samples were collected from monitoring wells MW-5, MW-6, MW-7, and MW-8. Monitoring wells at the site have exhibited decreasing levels of benzene, ethyl benzene, and xylenes across the last three sampling events. Small concentrations of Total Extractable Hydrocarbons as diesel (TEH-D) and TEH-waste oil (TEH-WO) were detected during the last sampling event (Appendix 1). Groundwater from MW-7 exhibited TEH-D and TEH-WO concentrations of 1,100 and 860 micrograms per liter ( $\mu\text{g/l}$ ), respectively; and MW-8 exhibited TEH-D and TEH-WO concentrations of 1,200 and 1,000  $\mu\text{g/l}$ , respectively (Appendix 5). A new potential receptor survey was completed and no new receptors were identified (Appendix 6).

The site will continued to be monitored annually in order to assure that concentrations of dissolved phase petroleum constituents on site continue to decline. Monitoring wells MW-5, MW-6, MW-7, and MW-8 will be sampled for Iowa OA-1 GCMS and OA-2; monitoring wells MW-5 and MW-6, along with other wells present on the map in Appendix 2, are also monitored for another identified leak site and results of those wells will continue to be reported with that site as well. Receptor surveys will also be conducted annually to assure that no new receptors are present.

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NATURAL RESOURCES

Please feel free to contact Tanya Drake or myself at (612) 789-2642 with any questions or comments related to this report or this site.

Sincerely,  
**EMR, Inc.**

A handwritten signature in black ink, appearing to read "Mike Goalen", written in a cursive style.

Mike Goalen  
Staff Scientist

Attachment

Cc: Judy McDonough, Manager of Environmental Remediation, BNSF, Kansas City, MO

# SITE MONITORING REPORT

**Burlington Northern Santa Fe Railway Company  
Roe Enterprises, Former Lease 238,029  
Intersection of West Jefferson and South Vale Street  
Osceola, Iowa  
Clarke County**

**EMR Project No. 4310.009-1**

***Prepared for:***

**Ms. Judith M. McDonough  
Manager of Environmental Remediation  
Burlington Northern Santa Fe Railway Company  
4515 Kansas Avenue  
Kansas City, Kansas 66106**

***Prepared by:***

**EMR, Inc.  
2500 39<sup>th</sup> Ave. NE, Suite 220  
Minneapolis, MN 55421**

**Tanya L. Drake  
IA GWP # 1949  
Project Geologist**

**NOVEMBER 2003**



**ENVIRONMENTAL MANAGEMENT RESOURCES**

# SITE MONITORING REPORT

**Burlington Northern Santa Fe Railway Company**  
**Roe Enterprises, Former Lease 238,029**  
Intersection of West Jefferson and South Vale Street  
Osceola, Iowa  
Clarke County

EMR Project No. 4310.009-1

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Ms. Judith M. McDonough  
Manager of Environmental Remediation  
**Burlington Northern Santa Fe Railway Company**  
4515 Kansas Avenue  
Kansas City, Kansas 66106

*Prepared by:*

**EMR, Inc.**  
2500 39<sup>th</sup> Ave. NE, Suite 220  
Minneapolis, MN 55421

Tanya L. Drake  
IA GWP # 1949  
Project Geologist

**NOVEMBER 2003**



**ENVIRONMENTAL MANAGEMENT RESOURCES**



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Appendix 1  
Groundwater Analytical Table

Appendix 1  
Groundwater Analytical Table  
Eastgate Oil  
SMR

Sample Location	Date	Benzene	Toluene	Ethyl benzene	Xylenes	TEH-D	TEH-WO	Napthalene	Groundwater Elevation
MW-5	9/13/2001	22	<1	164	55	N	N	23.1	1,132.99
MW-5	12/10/2001	16	<1	136	39	100	<100	N	1,133.23
MW-5	3/20/2002	16	<1	135	39	N	N	N	1134.45
MW-5	9/11/2002	3.4	<1	26	3.5	<400	<400	23.1	1,132.99
MW-5	9/8/2003	3.48	<1	<1	<3	<100	<100	N	1,131.00
MW-6	9/13/2001	18	5	22	59	N	N	<2	1,132.89
MW-6	12/10/2001	9	<1	18	26	800	<100	N	1,133.22
MW-6	3/20/2002	9	<1	14	19	N	N	N	1134.41
MW-6	9/8/2003	<1	<1	<1	<3	420	<100	N	1,130.65
MW-7	9/13/2001	2	<1	9	2	N	N	N	N
MW-7	3/20/2002	<1	<1	4	<1	N	N	N	1133.80
MW-7	9/24/2003	<1	<1	<1	<3	1100	860	N	1132.86
MW-8	9/13/2001	41	1	203	119	N	N	N	N
MW-8	3/20/2002	28	<1	64	30	N	N	N	1134.49
MW-8	9/24/2003	<1	<1	4.76	<3	1200	1000	N	1132.49

Analytical Data reported in ug/l






Appendix 2  
Site Plan Map

BNSF Lease Properties  
Roe enterprises and  
Eastgate Oil  
Osceola, IA

Appendix 2  
Site Plan Map

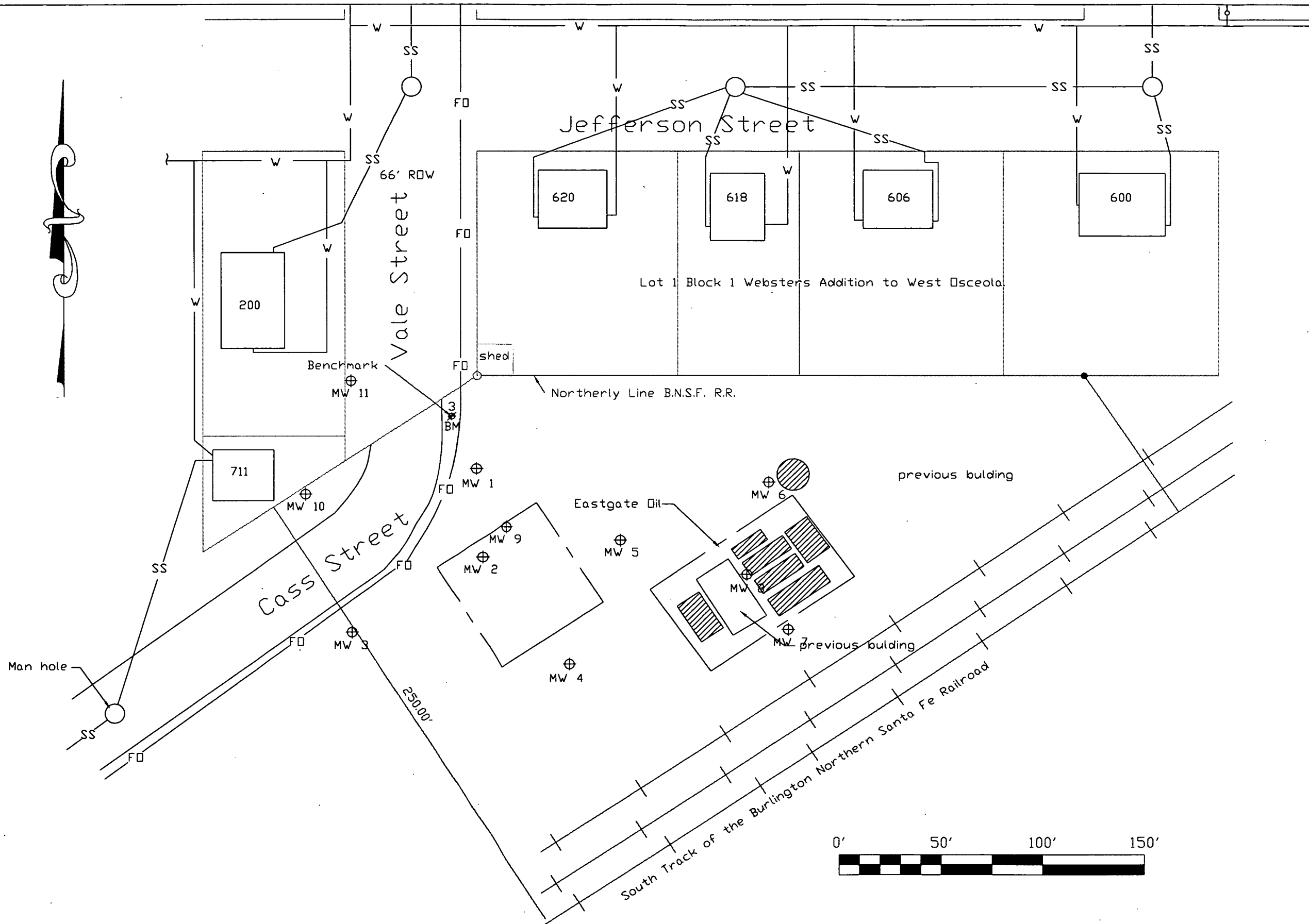
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CHECKED BY: TLD  
PROJECT NO. 4310.008-1.4310.009-1  
REVISION NO. 1  
DATE: September 21, 2001  
Scale: 1" = 50'

LEGEND

-  monitor well
-  water line
-  fiber optic line
-  sanitary sewer
-  previous AST's



ENVIRONMENTAL MANAGEMENT RESOURCES



BENCHMARK 1: USGS MONUMENT "H110" BY AMTRAK DEPOT. ELEV=1139.148'  
BENCHMARK 2: TOP OF SPIKE NAIL SOUTH FACE OF POWER POLE. ELEV=1139.10 (USGS)



Appendix 3  
Site Vicinity Map

BNSF Lease Properties  
 Roe enterprises and  
 Eastgate Oil  
 Osceola, IA

Appendix 3  
 Site Vicinity Map

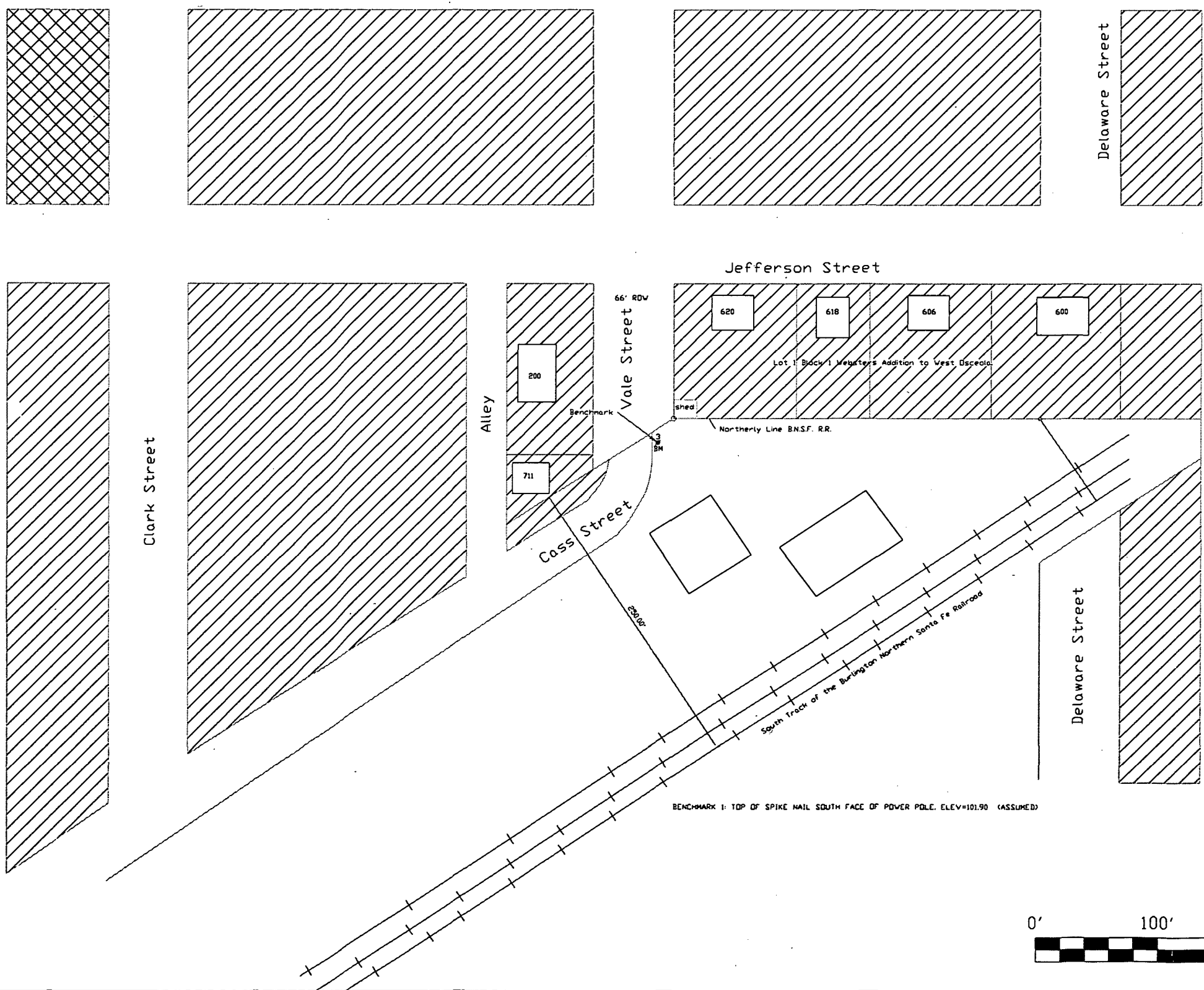
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 CHECKED BY: TLD  
 PROJECT NO. 4310.008-2,4310.009-1  
 REVISION NO. 1  
 DATE: September 21, 2001  
 Scale: 1" = 100'

LEGEND

-  Residential
-  Agriculture



ENVIRONMENTAL MANAGEMENT RESOURCES



Appendix 4  
Groundwater Flow Direction Map  
9/8/2003



BNSF Lease Properties  
Roe enterprises and  
Eastgate Oil  
Osceola, IA

Appendix 4  
Groundwater Flow  
Direction Map -  
9/08/03

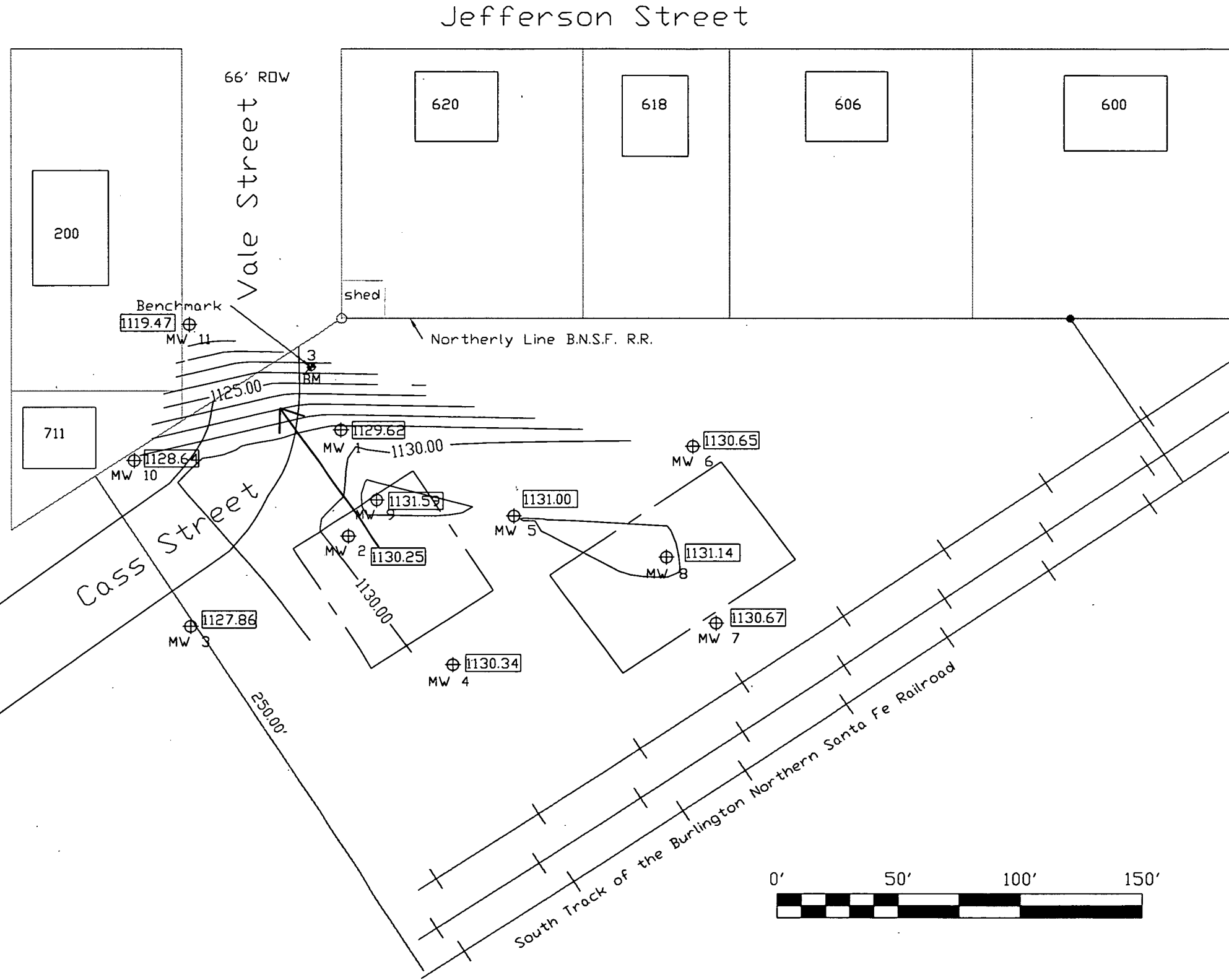
DRAWN BY: MEG  
CHECKED BY: TLD  
PROJECT NO. 4310.008-1,4310.009-1  
REVISION NO. 1  
DATE: September 21, 2001  
Scale: 1" = 50'

LEGEND

- ⊕ monitor well
- ↖ Groundwater Flow
- 96.02 GW Elevation (ft)



ENVIRONMENTAL MANAGEMENT RESOURCES



Appendix 5  
Groundwater Analytical Map

BNSF Lease Properties  
 Roe enterprises and  
 Eastgate Oil  
 Osceola, IA

Appendix 5  
 Groundwater  
 Contamination Map

DRAWN BY: MEG  
 CHECKED BY: TLD  
 PROJECT NO. 4310.008-1.4310.009-1  
 REVISION NO. 1  
 DATE: September 21, 2001  
 Scale: 1" = 50'

LEGEND

⊕ monitor well

B-Benzene  
 T-Toluene  
 E-Ethylbenzene  
 X-Xylene  
 N-Naphthalene  
 TEHD-TEH, Diesel  
 TEHW-TEH, Waste oil  
 \* All analytical results  
 are ug/l



ENVIRONMENTAL MANAGEMENT RESOURCES



Jefferson Street

66' ROW

Vale Street

Benchmark

shed

Northerly Line B.N.S.F. R.R.

Lot 1 Block 1 Websters Addition to West Osceola.

200

620

618

606

600

711

Cass Street

250.00'

B-3.48  
 T-<1  
 E-<1  
 X-<3  
 N-NA  
 TEHD-<100  
 TEHW-<100

MW 5

B-<1  
 T-<1  
 E-<1  
 X-<3  
 N-NA  
 TEHD-420  
 TEHW-<100

MW 6

B-<1  
 T-<1  
 E-4.76  
 X-<3  
 N-NA  
 TEHD-1200  
 TEHW-1000

MW 8

B-<1  
 T-<1  
 E-<1  
 X-<3  
 N-NA  
 TEHD-1100  
 TEHW-850

MW 7

South Track of the Burlington Northern Santa Fe Railroad

x-2



BENCHMARK 1: TOP OF SPIKE NAIL SOUTH FACE OF POWER POLE. ELEV=101.90 (ASSUMED)

Appendix 6  
Documentation

**Potential Receptor Summary**

**SMR,V-2.51,**

Surveys for new, removed, and replaced receptors must be conducted within the larger area of either 1) the receptor identification plume for the appropriate receptor type; or 2) the receptor-specific distance listed in brackets below.

Receptor questions	Yes/No	Contact Name/Company Name/ Complete Address	Contact Phone #	Date
New drinking water well(s)? [1,000']	No	Paul VanDorpe Iowa Department of Natural Resources 109 Townbridge Hall Iowa City, Iowa, 52242-1575	319 335-1575	10/22/03
New non-drinking water well(s)? [1,000']	No	Paul VanDorpe Iowa Department of Natural Resources 109 Townbridge Hall Iowa City, Iowa, 52242-1575	319 335-1575	10/22/03
Plugged drinking water well(s)? [1,000']	No	Paul VanDorpe Iowa Department of Natural Resources 109 Townbridge Hall Iowa City, Iowa, 52242-1575	319 335-1575	10/22/03
Plugged non-drinking water well(s)? [1,000']	No	Paul VanDorpe Iowa Department of Natural Resources 109 Townbridge Hall Iowa City, Iowa, 52242-1575	319 335-1575	10/22/03
New plastic water lines(s)? [200']	No	Steve Squire Oscola City Water Department 115 N. Fillmore Street Osceola, Iowa, 50213	641 342-2377	11/4/2003
Replaced or relocated plastic water line(s)? [200']	No	Steve Squire Oscola City Water Department 115 N. Fillmore Street Osceola, Iowa, 50213	641 342-2377	11/4/2003
New sanitary sewer(s)? [200']	No	Ron Stark Osceola Sewer Department 1986 Country Club Road Osceola, Iowa, 50213	641 342-4363	11/4/2003
Replaced or relocated sanitary sewer(s)? [200']	No	Ron Stark Osceola Sewer Department 1986 Country Club Road Osceola, Iowa, 50213	641 342-4363	11/4/2003
New building(s) with basements? [200']	No	Mary Potter Clark County Apraiser 100 S. Main St. Osceola, Iowa, 50213	641 342-3817	11/4/2003
Building(s) with basement(s) removed? [200']	No	Mary Potter Clark County Apraiser 100 S. Main St. Osceola, Iowa, 50213	641 342-3817	11/4/2003
Zoning changes? [200']	No	Mary Potter Clark County Apraiser 100 S. Main St. Osceola, Iowa, 50213	641 342-3817	11/4/2003

Iowa Department of Natural Resources  
 109 Trowbridge Hall  
 Iowa City, IA 52242-1319  
 319-335-1575  
 319-335-2754 (fax)



**To:** Mike Goalen  
 EMR, Inc.  
 2500 39th Ave. NE, Suite 220  
 Minneapolis, MN 55421  
 612-789-2642/612-789-2689 (fax)

**From:** Paul VanDorpe

**Date:** 10/22/2003

**Subject:** Well search for client-supplied map location      Search radius: 1,000 ft.

Included in search	No. of wells	Database
X	0	IGS well database general well database maintained by IGS, location accuracy varies 3,730 to 25 ft., last updated 8/2003.
X	0	Public wells (municipal) municipal well database maintained by IGS, location accuracy varies 3,730 to 25 ft., under development
X	0	Public wells (non-municipal) municipal well database maintained by IGS, location accuracy varies 3,730 to 25 ft., under development
X	4	Private well tracking system IDNR database management system for Grants-to-counties-covered wells. Locational accuracy unknown, assumed to be +/-17m., Last update 9/2003.
X	1	Wells registered for testing wells <i>tested</i> under Grant-to-Counties program. Locational accuracy varies 1150 to 150 m.; Last update 9/2001, no future updates planned.
X	0	Permitted private wells wells <i>permitted</i> under Grant-to-Counties program. Locational accuracy varies 1150 to 150 m.; Last update 9/2001, no future updates planned.
X	6	Registered abandoned wells wells <i>abandoned</i> under Grant-to-Counties program. Locational accuracy varies 1150 to 150 m.; Last update 9/2001, no future updates planned.
X	0	Public water supply wells and intakes locational accuracy 220 m., last updated 8/96
X	0	Water use permit facilities facilities permitted to withdraw >25,000 gallons per day, locational accuracy is +/- 3,750 ft.; last updated 10/96
X	0	Agricultural drainage wells locational accuracy 100m., last updated 4/98

**Well Search Results for client-supplied map location Search radius: 1,000**

**Private well tracking system wells**

Map Id	Well No.	Location	Well depth	Construction/ Permit date	Owner/Permittee	Other Information
5	2085764	T. 72 N., R. 25 W., Sec. 18, SE SW NE SW NW	15	11/27/1930	Kreibill, Vernon	Status: Plugged Use: Household Program source: Well plugging
6	2079164	T. 72 N., R. 25 W., Sec. 18, SE SE NW SE SE	68	5/10/1960	Cordes, Ken	Status: Plugged Use: Household Program source: Well plugging
7	2083570	T. 72 N., R. 25 W., Sec. 18, SE SE SW NW SE	38	9/20/1950	Foley, Lee	Status: Plugged Use: Household Program source: Well plugging
11	2078935	T. 72 N., R. 25 W., Sec. 18, SE SE SW SW SE	30	5/2/1950	Martin, Gary	Status: Plugged Use: Household Program source: Well plugging

**Wells registered for testing**

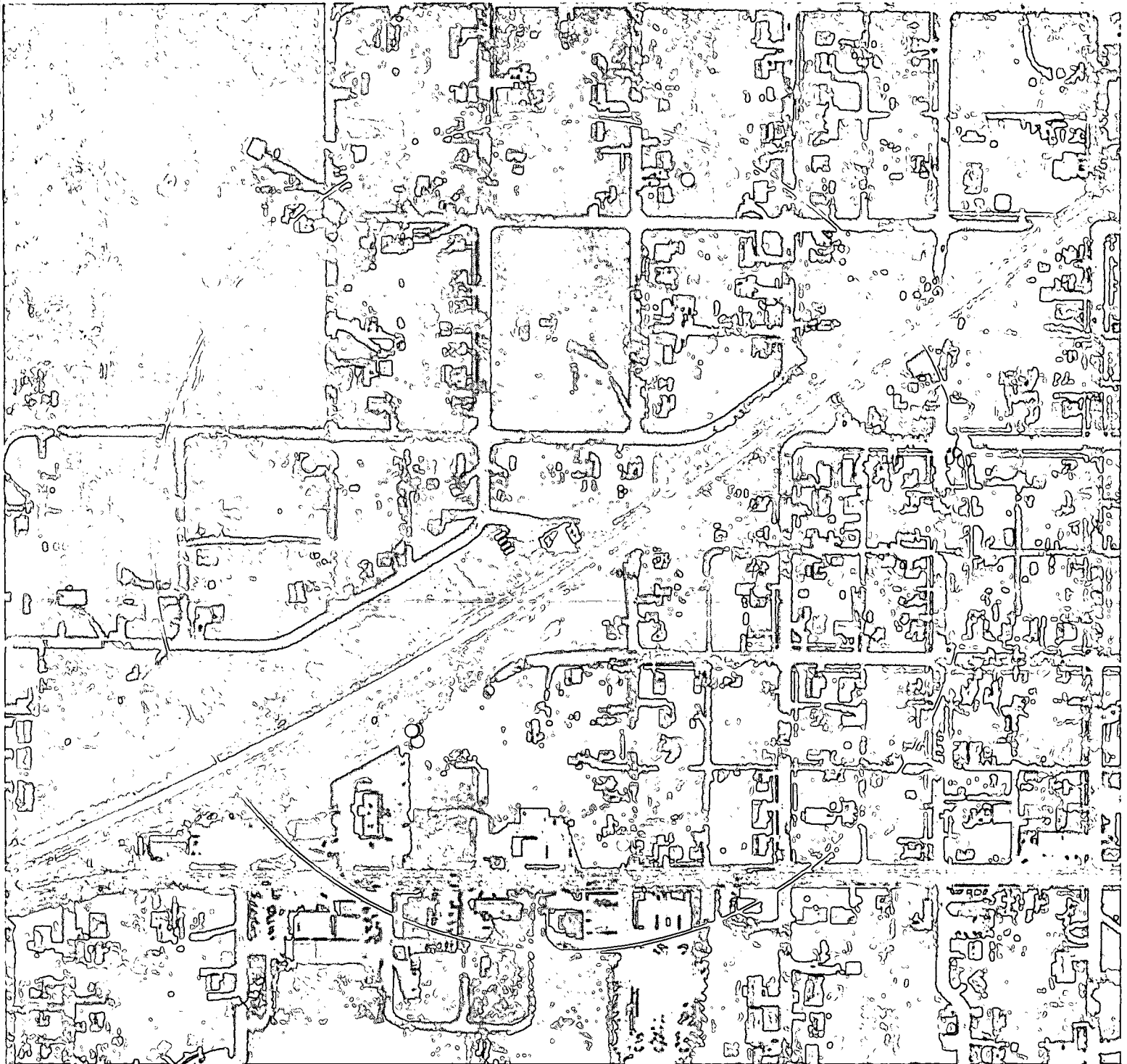
Map Id	Well No.	Location	Well depth	Construction/ Permit date	Owner/Permittee	Other Information
2	48326	T. 72 N., R. 25 W., Sec. 18, SE, SE, NE	unkn	unkn	Lamb, Reba	Drilling method: Unknown; Well depth is uncertain

**Registered abandoned wells**

Map Id	Well No.	Location	Well depth	Construction/ Permit date	Owner/Permittee	Other Information
1	31158	T. 72 N., R. 25 W., Sec. 18, SE, NE, SW	36	n.a.	Poil, Edna	Well plugged: 12/18/1997; Well type: < 18" dia.
3	24144	T. 72 N., R. 25 W., Sec. 18, SE, SE, NE	23	n.a.	Moy, Dwaine	Well plugged: 4/26/1996; Well type: > 18" dia.
4	26299	T. 72 N., R. 25 W., Sec. 18, SE, SE, NE	18	n.a.	Oehlert, Marty	Well plugged: 4/19/1996; Well type: unkn
8	26189	T. 72 N., R. 25 W., Sec. 18, SE, SW, SE	30	n.a.	Osceola Of City	Well plugged: 10/17/1996; Well type: < 18" dia.
9	46198	T. 72 N., R. 25 W., Sec. 18, SE, SW, SE	12	n.a.	Mongar, Doris	Well plugged: 7/18/2001; Well type: > 18" dia.
10	46197	T. 72 N., R. 25 W., Sec. 18, SE, SW, SE	30	n.a.	Mongar, Doris	Well plugged: 7/23/2001; Well type: < 18" dia.

# UST/LUST - Well Search

Client-supplied map location -- Search radius: 1,000 ft.



## Search results

- Registered abandoned wells
- Private well tracking system wells
- Wells registered for testing

0 100 200 300 400 500 Feet



Client-supplied map location for well search

Name: City Of Osceola  
Search radius: 1,000 ft.

Search date: October 22, 2003

Client provided map location was used for search.



Iowa Geological Survey  
109 Trowbridge Hall  
Iowa City, IA 52242-1319  
319-335-1575  
319-335-2754 (fax)

\*Note: wells with identical locations have been shifted from their original locations for the purpose of preparing this map.

Appendix 7  
Laboratory Analytical

EMR, Inc. - Minneapolis  
 2500 39th Ave. NE, Suite 220  
 Minneapolis, MN 55421

April 16, 2002

Work Order: 12C0733

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Analyte	Result	MRL	Method	Analyst	Analyzed	Qualifier
<b>12C0733-04</b>	<b>MW-4</b>		<b>Matrix: Water</b>		<b>Collected: 03/20/02 13:15</b>	
Anthracene	<0.50 ug/l	0.50	EPA 8310	FIZ	04/04/02 22:17	
Fluoranthene	0.34 ug/l	0.20	EPA 8310	FIZ	04/04/02 22:17	
Pyrene	<0.20 ug/l	0.20	EPA 8310	FIZ	04/04/02 22:17	
Benzo(a)anthracene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 22:17	
Chrysene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 22:17	
Benzo(b)fluoranthene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 22:17	
Benzo(k)fluoranthene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 22:17	
Benzo(a)pyrene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 22:17	
Indeno(1,2,3-cd)pyrene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 22:17	
Dibenzo(a,h)anthracene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 22:17	
Benzo(g,h,i)perylene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 22:17	
Surrogate: Triphenylene	101 %		70-130	FIZ	04/04/02 22:17	
Lead, total	<0.005 mg/l	0.005	EPA 6010B	RVV	03/26/02 12:00	

<b>12C0733-05</b>	<b>MW-5</b>		<b>Matrix: Water</b>		<b>Collected: 03/20/02 13:30</b>	
Benzene	16 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02 3:52	
Toluene	<1 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02 3:52	
Ethylbenzene	135 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02 3:52	
Xylenes, total	39 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02 3:52	
Methyl-t-butyl Ether (MTBE)	<1 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02 3:52	
Ethyl-tert-Butyl Ether (ETBE)	<2 ug/l	2	OA-1 (GC/MS)	TVK	04/02/02 3:52	
Di-iso-Propyl Ether (DIPE)	<2 ug/l	2	OA-1 (GC/MS)	TVK	04/02/02 3:52	
tert-Amyl Methyl Ether (TAME)	<2 ug/l	2	OA-1 (GC/MS)	TVK	04/02/02 3:52	
tert-Butyl Alcohol (TBA)	<50 ug/l	50	OA-1 (GC/MS)	TVK	04/02/02 3:52	
Surrogate: 4-Bromofluorobenzene	93.6 %		73-137	TVK	04/02/02 3:52	
Naphthalene	35.7 ug/l	2.00	EPA 8310	FIZ	04/04/02 23:03	
Acenaphthylene	23.0 ug/l	2.00	EPA 8310	FIZ	04/04/02 23:03	
Acenaphthene	29.9 ug/l	2.00	EPA 8310	FIZ	04/04/02 23:03	
Fluorene	1.51 ug/l	0.50	EPA 8310	FIZ	04/04/02 23:03	
Phenanthrene	<0.50 ug/l	0.50	EPA 8310	FIZ	04/04/02 23:03	
Anthracene	<0.50 ug/l	0.50	EPA 8310	FIZ	04/04/02 23:03	
Fluoranthene	<0.20 ug/l	0.20	EPA 8310	FIZ	04/04/02 23:03	
Pyrene	<0.20 ug/l	0.20	EPA 8310	FIZ	04/04/02 23:03	
Benzo(a)anthracene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:03	
Chrysene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:03	
Benzo(b)fluoranthene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:03	
Benzo(k)fluoranthene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:03	
Benzo(a)pyrene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:03	

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.

EMR, Inc. - Minneapolis  
2500 39th Ave. NE, Suite 220  
Minneapolis, MN 55421

April 16, 2002

Work Order: 12C0733

Page 5 of 7

Analyte	Result	MRL	Method	Analyst	Analyzed	Qualifier
12C0733-05	MW-5		Matrix: Water		Collected: 03/20/02 13:30	
Indeno(1,2,3-cd)pyrene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:03	
Dibenzo(a,h)anthracene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:03	
Benzo(g,h,i)perylene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:03	
Surrogate: Triphenylene	98.3 %		70-130	FIZ	04/04/02 23:03	
Lead, total	<0.005 mg/l	0.005	EPA 6010B	RVV	03/26/02 12:00	

12C0733-06	MW-6		Matrix: Water		Collected: 03/20/02 13:45	
Benzene	9 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02 4:30	
Toluene	<1 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02 4:30	
Ethylbenzene	14 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02 4:30	
Xylenes, total	19 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02 4:30	
Methyl-t-butyl Ether (MTBE)	<1 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02 4:30	
Ethyl-tert-Butyl Ether (ETBE)	<2 ug/l	2	OA-1 (GC/MS)	TVK	04/02/02 4:30	
Di-iso-Propyl Ether (DIPE)	<2 ug/l	2	OA-1 (GC/MS)	TVK	04/02/02 4:30	
tert-Amyl Methyl Ether (TAME)	<2 ug/l	2	OA-1 (GC/MS)	TVK	04/02/02 4:30	
tert-Butyl Alcohol (TBA)	<50 ug/l	50	OA-1 (GC/MS)	TVK	04/02/02 4:30	
Surrogate: 4-Bromofluorobenzene	106 %		73-137	TVK	04/02/02 4:30	
Naphthalene	<2.00 ug/l	2.00	EPA 8310	FIZ	04/04/02 23:51	
Acenaphthylene	<2.00 ug/l	2.00	EPA 8310	FIZ	04/04/02 23:51	
Acenaphthene	<2.00 ug/l	2.00	EPA 8310	FIZ	04/04/02 23:51	
Fluorene	<0.50 ug/l	0.50	EPA 8310	FIZ	04/04/02 23:51	
Phenanthrene	<0.50 ug/l	0.50	EPA 8310	FIZ	04/04/02 23:51	
Anthracene	<0.50 ug/l	0.50	EPA 8310	FIZ	04/04/02 23:51	
Fluoranthene	<0.20 ug/l	0.20	EPA 8310	FIZ	04/04/02 23:51	
Pyrene	<0.20 ug/l	0.20	EPA 8310	FIZ	04/04/02 23:51	
Benzo(a)anthracene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:51	
Chrysene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:51	
Benzo(b)fluoranthene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:51	
Benzo(k)fluoranthene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:51	
Benzo(a)pyrene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:51	
Indeno(1,2,3-cd)pyrene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:51	
Dibenzo(a,h)anthracene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:51	
Benzo(g,h,i)perylene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/04/02 23:51	
Surrogate: Triphenylene	98.3 %		70-130	FIZ	04/04/02 23:51	
Lead, total	<0.005 mg/l	0.005	EPA 6010B	RVV	03/26/02 12:00	

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.

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2500 39th Ave. NE, Suite 220  
Minneapolis, MN 55421

April 16, 2002

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Work Order: 12C0733

Analyte	Result	MRL	Method	Analyst	Analyzed	Qualifier
12C0733-07	MW-7		Matrix: Water		Collected: 03/20/02 14:00	
Benzene	<1 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02	5:08
Toluene	<1 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02	5:08
Ethylbenzene	4 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02	5:08
Xylenes, total	<1 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02	5:08
Methyl-t-butyl Ether (MTBE)	1 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02	5:08
Ethyl-tert-Butyl Ether (ETBE)	<2 ug/l	2	OA-1 (GC/MS)	TVK	04/02/02	5:08
Di-iso-Propyl Ether (DIPE)	<2 ug/l	2	OA-1 (GC/MS)	TVK	04/02/02	5:08
tert-Amyl Methyl Ether (TAME)	<2 ug/l	2	OA-1 (GC/MS)	TVK	04/02/02	5:08
tert-Butyl Alcohol (TBA)	<50 ug/l	50	OA-1 (GC/MS)	TVK	04/02/02	5:08
Surrogate: 4-Bromofluorobenzene	98.4 %		73-137	TVK	04/02/02	5:08
Naphthalene	4.78 ug/l	2.00	EPA 8310	FIZ	04/05/02	0:37
Acenaphthylene	24.8 ug/l	2.00	EPA 8310	FIZ	04/05/02	0:37
Acenaphthene	13.1 ug/l	2.00	EPA 8310	FIZ	04/05/02	0:37
Fluorene	<0.50 ug/l	0.50	EPA 8310	FIZ	04/05/02	0:37
Phenanthrene	<0.50 ug/l	0.50	EPA 8310	FIZ	04/05/02	0:37
Anthracene	<0.50 ug/l	0.50	EPA 8310	FIZ	04/05/02	0:37
Fluoranthene	<0.20 ug/l	0.20	EPA 8310	FIZ	04/05/02	0:37
Pyrene	<0.20 ug/l	0.20	EPA 8310	FIZ	04/05/02	0:37
Benzo(a)anthracene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	0:37
Chrysene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	0:37
Benzo(b)fluoranthene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	0:37
Benzo(k)fluoranthene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	0:37
Benzo(a)pyrene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	0:37
Indeno(1,2,3-cd)pyrene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	0:37
Dibenzo(a,h)anthracene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	0:37
Benzo(g,h,i)perylene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	0:37
Surrogate: Triphenylene	95.1 %		70-130	FIZ	04/05/02	0:37
Lead, total	<0.005 mg/l	0.005	EPA 6010B	RVV	03/26/02	12:00

12C0733-08	MW-8		Matrix: Water		Collected: 03/20/02 14:15	
Benzene	28 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02	5:46
Toluene	<1 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02	5:46
Ethylbenzene	64 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02	5:46
Xylenes, total	30 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02	5:46
Methyl-t-butyl Ether (MTBE)	7 ug/l	1	OA-1 (GC/MS)	TVK	04/02/02	5:46
Ethyl-tert-Butyl Ether (ETBE)	<2 ug/l	2	OA-1 (GC/MS)	TVK	04/02/02	5:46
Di-iso-Propyl Ether (DIPE)	<2 ug/l	2	OA-1 (GC/MS)	TVK	04/02/02	5:46
tert-Amyl Methyl Ether (TAME)	<2 ug/l	2	OA-1 (GC/MS)	TVK	04/02/02	5:46

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 Minneapolis, MN 55421

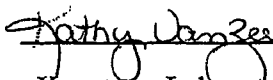
April 16, 2002

Work Order: 12C0733

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Analyte	Result	MRL	Method	Analyst	Analyzed	Qualifier
12C0733-08	MW-8		Matrix: Water		Collected: 03/20/02 14:15	
tert-Butyl Alcohol (TBA)	<50 ug/l	50	OA-1 (GC/MS)	TVK	04/02/02	5:46
Surrogate: 4-Bromofluorobenzene	97.6 %		73-137	TVK	04/02/02	5:46
Naphthalene	14.5 ug/l	2.00	EPA 8310	FIZ	04/05/02	1:23
Acenaphthylene	2.06 ug/l	2.00	EPA 8310	FIZ	04/05/02	1:23
Acenaphthene	5.90 ug/l	2.00	EPA 8310	FIZ	04/05/02	1:23
Fluorene	0.81 ug/l	0.50	EPA 8310	FIZ	04/05/02	1:23
Phenanthrene	<0.50 ug/l	0.50	EPA 8310	FIZ	04/05/02	1:23
Anthracene	<0.50 ug/l	0.50	EPA 8310	FIZ	04/05/02	1:23
Fluoranthene	<0.20 ug/l	0.20	EPA 8310	FIZ	04/05/02	1:23
Pyrene	<0.20 ug/l	0.20	EPA 8310	FIZ	04/05/02	1:23
Benzo(a)anthracene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	1:23
Chrysene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	1:23
Benzo(b)fluoranthene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	1:23
Benzo(k)fluoranthene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	1:23
Benzo(a)pyrene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	1:23
Indeno(1,2,3-cd)pyrene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	1:23
Dibenzo(a,h)anthracene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	1:23
Benzo(g,h,i)perylene	<0.10 ug/l	0.10	EPA 8310	FIZ	04/05/02	1:23
Surrogate: Triphenylene	86.8 %		70-130	FIZ	04/05/02	1:23
Lead, total	<0.005 mg/l	0.005	EPA 6010B	RVV	03/26/02	12:00

End of Report



Keystone Laboratories, Inc.  
 Kathy Van Zee  
 Project Manager

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# CHAIN OF CUSTODY RECORD



600 E. 17<sup>th</sup> St. S.       3012 Ansbrough Ave.       1304 Adams  
 Newton, IA 50208      Waterloo, IA 50701      Kansas City, KS 66103  
 Phone: 641-792-8451      Phone: 319-235-4440      Phone: 913-321-7856  
 Fax: 641-792-7989      Fax: 319-235-2480      Fax: 913-321-7937

PAGE 1 OF 1

PRINT OR TYPE INFORMATION BELOW SAMPLER: <u>Mike Gaden</u> SITE NAME: <u>BNSF-Osceola</u> ADDRESS: _____ CITY/ST/ZIP: _____ PHONE: _____	REPORT TO: NAME: <u>Mike Gaden</u> COMPANY NAME: <u>EMR</u> ADDRESS: <u>2500 31<sup>st</sup> Ave NE Suite 220</u> CITY/ST/ZIP: <u>Minneapolis, MN 55421</u> PHONE: <u>612-789-2642</u> FAX: <u>612-789-2689</u>	BILL TO: NAME: <u>Same</u> COMPANY NAME: _____ ADDRESS: _____ CITY/ST/ZIP: _____ PHONE: _____ Keystone Quote No.: _____ <span style="font-size: small;">(If Applicable)</span>
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CLIENT SAMPLE NUMBER	DATE	TIME	SAMPLE LOCATION	NO. OF CONTAINERS	MATRIX	GRAB/COMPOSITE	ANALYSES REQUIRED						LAB USE ONLY									
							OAI	PAH	Lead							LABORATORY WORK ORDER NO.	LABORATORY SAMPLE NUMBER					
MW-1	3/20	12:30	Osceola	5	GW	G	X	X	X													
MW-2	}	12:45	}	}	}	}	X	X	X									01				
MW-3		13:00					X	X	X												02	
MW-4		13:15					X	X	X													03
MW-5		13:30					X	X	X													04
MW-6		13:45					X	X	X													05
MW-7		14:00					X	X	X									06				
MW-8	3/20	14:15	Osceola	5	GW	G	X	X	X									07				
																		08				

Relinquished by: (Signature) <u>[Signature]</u>	Date 3/22/02 Time 8:30 AM	Received by: (Signature) <u>[Signature]</u>	Date 3-22-02 Time 8:32	Turn-Around: <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Rush Contact Lab Prior to Submission Remarks: <u>Called 3-22-02 HQ - OAI -</u>
Relinquished by: (Signature)	Date	Received for Lab by: (Signature) <u>[Signature]</u>	Date	

Lab Project Number: 6062679  
Client Project ID: IA Roe Osceola, Iowa

Lab Sample No: 605429307      Project Sample Number: 6062679-005      Date Collected: 09/11/02 16:45  
Client Sample ID: IA ROE\_MW-5      Matrix: Water      Date Received: 09/15/02 10:41

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
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**GC Semivolatiles**

Total Extractable Hydrocarbons		Prep/Method: OA2 / OA2							
Mineral Spirits	ND	mg/l	0.40	1.0	09/23/02 00:53	MIM			
Jet Fuel	ND	mg/l	0.40	1.0	09/23/02 00:53	MIM			
Kerosene	ND	mg/l	0.40	1.0	09/23/02 00:53	MIM			
Diesel Fuel	ND	mg/l	0.40	1.0	09/23/02 00:53	MIM	68334-30-5		
Fuel Oil	ND	mg/l	0.40	1.0	09/23/02 00:53	MIM	68334-30-5		
Motor Oil	ND	mg/l	0.40	1.0	09/23/02 00:53	MIM			
n-Tetracosane (S)	67	%		1.0	09/23/02 00:53	MIM	646-31-1		
Date Extracted					09/19/02				

**GC Volatiles**

TPH Gas		Method: OA1							
Gasoline Range Hydrocarbons	0.793	mg/l	0.500	1.0	09/20/02 02:32	SHF			
4-Bromofluorobenzene (S)	100	%		1.0	09/20/02 02:32	SHF	460-00-4		

**GC/MS Volatiles**

GC/MS VOCs by 8260 (Low Level)		Method: EPA 8260							
Benzene	3.4	ug/l	1.0	1.0	09/23/02 20:28	JSR	71-43-2		
Ethylbenzene	26.	ug/l	1.0	1.0	09/23/02 20:28	JSR	100-41-4		
Methyl-tert-butyl ether	ND	ug/l	1.0	1.0	09/23/02 20:28	JSR	1634-04-4		
Toluene	ND	ug/l	1.0	1.0	09/23/02 20:28	JSR	108-88-3		
Xylene (Total)	3.5	ug/l	3.0	1.0	09/23/02 20:28	JSR	1330-20-7		
Toluene-d8 (S)	106	%		1.0	09/23/02 20:28	JSR	2037-26-5		
4-Bromofluorobenzene (S)	107	%		1.0	09/23/02 20:28	JSR	460-00-4		
Dibromofluoromethane (S)	104	%		1.0	09/23/02 20:28	JSR	1868-53-7		
1,2-Dichloroethane-d4 (S)	108	%		1.0	09/23/02 20:28	JSR	17060-07-0		

**REPORT OF LABORATORY ANALYSIS**

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Lab Project Number: 1078130

Client Project ID: IA-BNSF ROE Ent. 4310

Lab Sample No: 104872783

Project Sample Number: 1078130-005

Date Collected: 09/08/03 16:15

Client Sample ID: MW-5

Matrix: Water

Date Received: 09/12/03 12:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
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**GC Semivolatiles**

OA2 Iowa Water	Prep/Method: OA2 / OA2							
Mineral Spirits	ND	mg/l	0.10	09/23/03	21:19	BKR		
Gasoline	0.75	mg/l	0.10	09/23/03	21:19	BKR		
Kerosene	ND	mg/l	0.10	09/23/03	21:19	BKR		
Diesel Fuel	ND	mg/l	0.10	09/23/03	21:19	BKR	68334-30-5	
Fuel Oil	ND	mg/l	0.10	09/23/03	21:19	BKR	68334-30-5	
Motor Oil	ND	mg/l	0.10	09/23/03	21:19	BKR		
Hydraulic Fluid	ND	mg/l	0.10	09/23/03	21:19	BKR		
Date Extracted	09/15/03			09/15/03				

**GC Volatiles**

Iowa Water by OA1	Method: OA1							
Gasoline Range Hydrocarbons	ND	ug/l	500.	09/17/03	10:50	TP1		
Benzene	3.48	ug/l	1.00	09/17/03	10:50	TP1	71-43-2	
Toluene	ND	ug/l	1.00	09/17/03	10:50	TP1	108-88-3	
Xylene (Total)	ND	ug/l	3.00	09/17/03	10:50	TP1	1330-20-7	
Ethylbenzene	ND	ug/l	1.00	09/17/03	10:50	TP1	100-41-4	
a,a,a-Trifluorotoluene (S)	105	%		09/17/03	10:50	TP1	98-08-8	

**REPORT OF LABORATORY ANALYSIS**

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Lab Project Number: 1078130  
Client Project ID: IA-BNSF ROE Ent. 4310

Lab Sample No: 104872791      Project Sample Number: 1078130-006      Date Collected: 09/08/03 16:40  
Client Sample ID: MW-6      Matrix: Water      Date Received: 09/12/03 12:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
<b>GC Semivolatiles</b>								
OA2 Iowa Water	Prep/Method: OA2 / OA2							
Mineral Spirits	ND	mg/l	0.10	09/24/03 01:27	BKR			
Gasoline	ND	mg/l	0.10	09/24/03 01:27	BKR			
Kerosene	ND	mg/l	0.10	09/24/03 01:27	BKR			
Diesel Fuel	0.42	mg/l	0.10	09/24/03 01:27	BKR	68334-30-5		
Fuel Oil	ND	mg/l	0.10	09/24/03 01:27	BKR	68334-30-5		
Motor Oil	ND	mg/l	0.10	09/24/03 01:27	BKR			
Hydraulic Fluid	ND	mg/l	0.10	09/24/03 01:27	BKR			
Date Extracted	09/15/03			09/15/03				

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
<b>GC Volatiles</b>								
Iowa Water by OA1	Method: OA1							
Gasoline Range Hydrocarbons	ND	ug/l	500.	09/17/03 11:21	TP1			
Benzene	ND	ug/l	1.00	09/17/03 11:21	TP1	71-43-2		
Toluene	ND	ug/l	1.00	09/17/03 11:21	TP1	108-88-3		
Xylene (Total)	ND	ug/l	3.00	09/17/03 11:21	TP1	1330-20-7		
Ethylbenzene	ND	ug/l	1.00	09/17/03 11:21	TP1	100-41-4		
a.a.a-Trifluorotoluene (S)	102	%		09/17/03 11:21	TP1	98-08-8		

**REPORT OF LABORATORY ANALYSIS**

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Lab Sample No: 104917778

Project Sample Number: 1078797-001

Date Collected: 09/24/03 16:15

Client Sample ID: MW-8

Matrix: Water

Date Received: 09/25/03 15:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
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**GC Semivolatiles**

OA2 Iowa Water		Prep/Method: OA2 / OA2						
Mineral Spirits	ND	mg/l	0.10	10/03/03	19:48	BKR		
Gasoline	ND	mg/l	0.10	10/03/03	19:48	BKR		
Kerosene	ND	mg/l	0.10	10/03/03	19:48	BKR		
Diesel Fuel	1.2	mg/l	0.10	10/03/03	19:48	BKR	68334-30-5	
Fuel Oil	ND	mg/l	0.10	10/03/03	19:48	BKR	68334-30-5	
Motor Oil	ND	mg/l	0.10	10/03/03	19:48	BKR		
Hydraulic Fluid	1.0	mg/l	0.10	10/03/03	19:48	BKR		
Date Extracted	09/30/03			09/30/03				

**GC Volatiles**

Iowa Water by OA1		Method: OA1						
Gasoline Range Hydrocarbons	ND	ug/l	500.	10/03/03	18:50	TP1		
Benzene	ND	ug/l	1.00	10/03/03	18:50	TP1	71-43-2	
Toluene	ND	ug/l	1.00	10/03/03	18:50	TP1	108-88-3	
Xylene (Total)	ND	ug/l	3.00	10/03/03	18:50	TP1	1330-20-7	
Ethylbenzene	4.76	ug/l	1.00	10/03/03	18:50	TP1	100-41-4	
a,a,a-Trifluorotoluene (S)	107	%		10/03/03	18:50	TP1	98-08-8	

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Lab Project Number: 1078797  
Client Project ID: IA-EASTGATE OIL 4310.009-1

Lab Sample No: 104917786      Project Sample Number: 1078797-002      Date Collected: 09/24/03 15:45  
Client Sample ID: MW-7      Matrix: Water      Date Received: 09/25/03 15:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC Semivolatiles</b>								
OA2 Iowa Water	Prep/Method: OA2 / OA2							
Mineral Spirits	ND	mg/l	0.10	10/03/03 20:24	BKR			
Gasoline	ND	mg/l	0.10	10/03/03 20:24	BKR			
Kerosene	ND	mg/l	0.10	10/03/03 20:24	BKR			
Diesel Fuel	1.1	mg/l	0.10	10/03/03 20:24	BKR	68334-30-5		
Fuel Oil	ND	mg/l	0.10	10/03/03 20:24	BKR	68334-30-5		
Motor Oil	ND	mg/l	0.10	10/03/03 20:24	BKR			
Hydraulic Fluid	0.86	mg/l	0.10	10/03/03 20:24	BKR			
Date Extracted	09/30/03			09/30/03				

<b>GC Volatiles</b>								
Iowa Water by OA1	Method: OA1							
Gasoline Range Hydrocarbons	ND	ug/l	500.	10/03/03 19:20	TP1			
Benzene	ND	ug/l	1.00	10/03/03 19:20	TP1	71-43-2		
Toluene	ND	ug/l	1.00	10/03/03 19:20	TP1	108-88-3		
Xylene (Total)	ND	ug/l	3.00	10/03/03 19:20	TP1	1330-20-7		
Ethylbenzene	ND	ug/l	1.00	10/03/03 19:20	TP1	100-41-4		
a,a,a-Trifluorotoluene (S)	109	%		10/03/03 19:20	TP1	98-08-8		

## REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414  
Phone: 612.607.1700  
Fax: 612.607.6444

Lab Project Number: 1078797  
Client Project ID: IA-EASTGATE OIL 4310.009-1

Lab Sample No: 104917836      Project Sample Number: 1078797-003      Date Collected: 09/24/03 00:00  
Client Sample ID: TB-9/24      Matrix: Water      Date Received: 09/25/03 15:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
<b>GC Volatiles</b>								
Iowa Water by OA1	Method: OA1							
Gasoline Range Hydrocarbons	ND	ug/l	500.	10/03/03 17:48	TP1			
Benzene	ND	ug/l	1.00	10/03/03 17:48	TP1	71-43-2		
Toluene	ND	ug/l	1.00	10/03/03 17:48	TP1	108-88-3		
Xylene (Total)	ND	ug/l	3.00	10/03/03 17:48	TP1	1330-20-7		
Ethylbenzene	ND	ug/l	1.00	10/03/03 17:48	TP1	100-41-4		
a,a,a-Trifluorotoluene (S)	111	%		10/03/03 17:48	TP1	98-08-8		

Date: 10/08/03

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PARAMETER FOOTNOTES

- ND Not detected at or above adjusted reporting limit
- NC Not Calculable
- J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
- MDL Adjusted Method Detection Limit
- (S) Surrogate

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QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

- LCS(D) Laboratory Control Sample (Duplicate)
- MS(D) Matrix Spike (Duplicate)
- DUP Sample Duplicate
- ND Not detected at or above adjusted reporting limit
- NC Not Calculable
- J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
- MDL Adjusted Method Detection Limit
- RPD Relative Percent Difference
- (S) Surrogate

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