



Kerr-McGee Oil & Gas Onshore LP
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May 14, 2014

Mr. Rick Allison
Environmental Protection Specialist
Colorado Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801
Denver, Colorado 80203

Re: No Further Action Status Request
Wass #5
COGCC Remediation No. 4369
API# 05-123-13781
NENE 25-T5N-R66W

Dear Mr. Allison:

Kerr-McGee Oil and Gas Onshore LP (Kerr-McGee) is submitting this letter report as an update to the Form 27 submitted on September 29, 2008 and the Site Assessment Report submitted on May 19, 2010 for the Wass #5 flowline release. We are requesting a No Further Action (NFA) status for this site.

Site Background and Excavation Summary

On June 26, 2008, a corrosion hole was discovered in the flowline associated with the subject well. The volume of the release is unknown. The well was shut in and the petroleum hydrocarbon impacted soil was excavated. Confirmation soil samples collected on June 30, 2008 indicated total petroleum hydrocarbon (TPH) concentrations in the base and the northern, eastern, and southern sidewalls of the excavation were below the Colorado Oil and Gas Conservation Commission (COGCC) sensitive area allowable level of 1,000 milligrams per kilogram (mg/kg). The sensitive area allowable level was in effect prior to the April 1, 2009 COGCC rule changes.

As presented in the Form 27, the excavation continued to the west until encountering a north to south trending utility corridor. Included in the utility corridor (east to west) is a stormwater drain, Comcast cable line, fiber optics communications line, a retail natural gas line, and a reclaimed water line. On July 1, 2008, six confirmation soil samples were collected from the western excavation sidewall for TPH analysis. One of the six soil samples (W03@9') exceeded the COGCC sensitive area allowable level for TPH at a depth of 9 feet below ground surface (bgs). At this point, the flowline excavation was backfilled. Groundwater was not encountered in the excavation.

On August 6, 2008, a truck-mounted GeoProbe[®] rig was used to advance three soil borings (SB01 through SB03) within the utility corridor, which is situated between the west wall of the backfilled excavation and an adjacent residential property (2322 Quay Street, Evans, CO 80620). The soil borings were completed to assess petroleum hydrocarbon soil impacts within the utility corridor, where excavation was impracticable. SB01 and SB02 were advanced to a depth of 12 feet bgs at points approximately 9 feet to the west of excavation soil sample W03@9'. Soil boring SB03 was also advanced to 12 feet bgs, but at a point approximately 18 feet to the west of the former western sidewall. All three soil borings were continuously sampled and screened for volatile organic compounds (VOCs) using a photo-ionization detector (PID). One soil sample was collected for TPH analysis from each soil boring at a depth of 9 feet bgs. TPH concentrations were below the laboratory reporting limit of 50 mg/kg in all three soil boring samples. The general site layout, excavation extent, and soil boring locations are depicted on Figure 1.

Approximately 360 cubic yards (yd³) of petroleum hydrocarbon impacted soil were removed from the excavation and transported to the North Weld Landfill in Ault, Colorado for disposal. Based on the excavation soil sample and the assessment soil boring sample analytical results, the volume of impacted soil exceeding the COGCC sensitive area allowable remaining in place beneath the utility corridor was estimated to be 33 yd³.

On January 27, 2010, the COGCC responded to the September 2008 Form 27 submittal requesting that Kerr-McGee prepare and submit an alternative remediation work plan with the primary objective of further assessing known and potential impacts related to the impacted soil remaining in place beneath the utility corridor. Prior to preparing a work plan, representatives from the COGCC, Kerr-McGee, and LT Environmental, Inc. (LTE) met on February 25, 2010 to discuss the site.

The resulting Site Assessment Work Plan (Work Plan) was submitted to the COGCC on March 4, 2010 and conditionally approved by the COGCC in an email dated March 5, 2010. The assessment objectives outlined in the Work Plan were as follows: 1) assess impacted soil left in place following the 2008 excavation to determine if petroleum hydrocarbon concentrations exceed the new (post-April 1, 2009) COGCC allowable levels for TPH and benzene, toluene, ethylbenzene and total xylenes (BTEX); 2) assess BTEX concentrations in soil gas along the utility corridor; and 3) assess indoor air in the adjacent single-family residence for the presence of VOCs, specifically BTEX.

2010 Site Assessment Report Summary

LTE oversaw site assessment field activities that included advancement of soil borings to collect subsurface soil and soil vapor samples in March 2010 and the installation and sampling of groundwater monitoring wells in April 2010. The 2010 site assessment field activities, findings,

analytical results, and conclusions are summarized below and were also presented to the COGCC in a Site Assessment Report submitted on May 19, 2010.

Soil Sampling

The TPH concentration in the northern sidewall confirmation soil sample (N01@9') collected from the flowline excavation in June 2008 was 780 mg/kg at a depth of 9 feet. Per the Work Plan, two soil borings (SB04 and SB05) were advanced just beyond the northern sidewall of the former excavation to confirm that TPH concentrations at this location had attenuated to levels below the current COGCC allowable level for TPH (500 mg/kg), as well as the new allowable levels for BTEX in soil.

Soil borings SB04 and SB05 were advanced to a total depth of 10 feet bgs using a truck-mounted GeoProbe[®] rig. Grey stained soil with a petroleum hydrocarbon odor was encountered in SB04 from 9.5 feet to 10 feet bgs. Grey stained soil with a petroleum hydrocarbon odor was observed in SB05 from 7 feet to 10 feet bgs. Despite the absence of groundwater in the 2008 flowline excavation, saturated soil was encountered in the SB04 soil boring at approximately 7.0 feet bgs and in the SB05 soil boring at approximately 5.5 feet bgs. Based on the presence of groundwater, one soil sample was collected from each soil boring immediately above the water table. Soil samples SB04@7' and SB05@5.5' were submitted for laboratory analysis of TPH by Environmental Protection Agency (EPA) Methods 8015 and 8260B and BTEX by EPA Method 8260B. TPH and BTEX concentrations in both soil boring samples were below the COGCC allowable levels and below the laboratory reporting limits.

A temporary monitoring well was completed in soil boring SB05, but there was insufficient groundwater present in the well for sample collection at the conclusion of field activities on March 23, 2010. The temporary well and soil boring were properly abandoned prior to exiting the site. The soil boring locations are presented in Figure 1.

Soil Vapor Sampling

Three soil vapor sampling points (VP1, VP2, and VP3) were advanced immediately to the east of the utility corridor and three vapor sampling points (VP4, VP5, and VP6) were advanced within the utility corridor. Due to the unexpected presence of shallow groundwater, the soil vapor sampling depths were adjusted from the proposed 2-4, 6-8, and 10-12 foot bgs intervals to 2-4 and 4-6 foot bgs intervals to ensure the vapor samples were collected from above the saturated zone. The soil vapor sampling points are presented in Figure 1.

Soil vapor samples were collected using an expendable point, an expendable point holder, a post run tubing adapter, and dedicated polyethylene tubing (³/₈-inch). A minimum of 4 liters of vapor were purged from the tubing and void space prior to collecting each soil vapor sample in a tedlar sample bag. PID screening of soil vapors was conducted during the purge, as requested by the

COGCC in their conditional approval of the Work Plan. The soil vapor samples were submitted for BTEX analysis by EPA Method TO-15 Modified.

PID readings obtained while purging the vapor sampling points ranged from 0.0 to 1.7 parts per million (ppm). Laboratory analytical results indicated reportable concentrations of one or more BTEX constituents in 9 of the 12 soil vapor samples. However, all the benzene concentrations were below the Colorado Oil and Public Safety (OPS) residential soil vapor Risk Based Screening Level (RBSL) for benzene (2,700 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)), as listed in the OPS Vapor Intrusion Guidance Document.

Indoor Air Sampling

As requested by the COGCC, Kerr-McGee notified the owner of the adjacent residence of the potential hazards of VOC accumulation in confined spaces and offered to perform indoor air monitoring in the residence located at 2322 Quay Street. LTE contracted Environmental Health & Safety Documents, Inc. (EHS) on behalf of Kerr-McGee to conduct air monitoring in the adjacent residence.

On March 17, 2010 EHS placed four summa canisters with flow regulators at the residence to monitor indoor air for BTEX constituents over a 24-hour sampling period. The canisters were placed in the living room, master bedroom, crawl space, and outside the residence. The outdoor summa was used to measure ambient BTEX levels in outdoor air. The summa canisters were submitted for laboratory analysis of BTEX by EPA Method TO-15 Modified.

In addition to the summa canisters, real-time air monitoring for percent lower explosive limit (LEL) and organic vapors was performed using a Draeger XAM 7000 monitor and real-time benzene monitoring was performed using a hand-held Gastec pump and benzene detector tubes.

Real time percent LEL and organic vapor measurements were collected in ten locations within the residence, including the crawl space. All the percent LEL and organic vapor measurements were 0.0 ppm. Three real time benzene detector tube measurements were collected at different locations within the residence, including the crawl space. Test results were 0.0 ppm at all three sampling locations.

BTEX constituents were detected in all four summa canister samples. Benzene concentrations ranged from $2.9 \mu\text{g}/\text{m}^3$ in the outdoor sample to $4.6 \mu\text{g}/\text{m}^3$ in the living room sample. The OPS Vapor Intrusion Guidance Document recommends comparing indoor values to exterior concentrations for benzene, but does not address levels of toluene, ethylbenzene or xylenes. Due to the high variability associated with outdoor benzene samples, the OPS considers an associated indoor air benzene concentration within 3 to $5 \mu\text{g}/\text{m}^3$ of the outdoor sample to be representative of background levels and not indicative of a vapor intrusion pathway. Benzene concentrations in all three indoor air samples were within $1.7 \mu\text{g}/\text{m}^3$ of the benzene concentration recorded in the

outdoor air sample. A copy of the EHS report was presented to the COGCC as an appendix to the Site Assessment Report.

Groundwater Sampling

LTE personnel returned to the site on April 15, 2010 with a drilling crew and a track-mounted GeoProbe[®] rig to install three permanent groundwater monitoring wells (MW01 through MW03). MW01 was installed within the former flowline excavation. MW02 and MW03 were installed down-gradient of the former excavation. LTE personnel returned to the site on April 21, 2010 to sample the monitoring wells. The groundwater samples were submitted for BTEX analysis by EPA Method 8260B. The monitoring well locations are depicted on Figure 2.

Benzene concentrations in the MW01 and MW02 groundwater samples exceeded the Colorado Groundwater Quality Standard (CGWQS) for benzene of 5 micrograms per liter (µg/l) at concentrations of 21 and 54 µg/l, respectively. BTEX constituents were not detected in MW03 above the laboratory reporting limit during the April 2010 sampling event.

Conclusions and Recommendations

- Impacted soil with TPH concentrations exceeding the COGCC allowable of 500 mg/kg left in place at the conclusion of the flowline excavation activities (soil samples N01@9' and W03@9') is situated below the water table, which was encountered at depths as shallow as 5.5 feet bgs during the assessment activities.
- Soil vapor samples collected within the utility corridor contained BTEX at low-level concentrations. Benzene concentrations in the soil vapor samples were all below the OPS RBSL for the residential indoor air vapor intrusion pathway.
- Indoor air monitoring (real time and 24-hour summa samples) indicate that a vapor intrusion pathway does not exist for the residence at 2322 Quay Street and that benzene concentrations recorded in the indoor summa canister samples are representative of and consistent with benzene concentrations present in ambient outdoor air.
- Benzene concentrations exceeded the CGWQS in monitoring wells MW01 and MW02. Additional monitoring wells will be installed down-gradient of MW02 to establish points of compliance (POC) and groundwater monitoring will continue on a quarterly basis.

Quarterly Groundwater Monitoring

As recommended in the 2010 Site Assessment report, additional groundwater monitoring wells were installed at the site to delineate the extent of the dissolved phase groundwater impacts. Between June 2010 and November 2010, eleven additional monitoring wells (MW04 through MW14) were installed at the site. Following the November 2010 quarterly groundwater

monitoring event, monitoring wells MW03, MW04, MW09, and MW11 through MW14 were designated as point of compliance wells. Groundwater monitoring continued on a quarterly basis.

As of the July 17, 2013 quarterly monitoring event, BTEX concentrations in all the site monitoring wells (MW01 through MW14) have remained below the CGWQS for four consecutive quarterly monitoring events. A Site Map showing the general site layout, excavation outline, soil boring locations, soil vapor sample points, and groundwater monitoring well locations is provided as Figure 1. The groundwater analytical results are summarized in Table 1 and the laboratory analytical reports are attached.

On October 24, 2013, the groundwater monitoring wells were surveyed to confirm the groundwater flow direction at the site. The survey data and water level data confirmed the groundwater flow direction is to the east-southeast. The relative groundwater elevations are provided in Table 1. A Groundwater Elevation Contour Map is provided as Figure 2.

The 2010 Site Assessment Report findings concluded that soil left in place at the conclusion of the 2008 flowline excavation at an approximate depth of 9 feet bgs was in fact located below the water table, which is present at approximately 7 feet to 9 feet bgs. As such these soil results were addressed through monitoring and natural attenuation of the associated groundwater impact and the 2008 flowline excavation effectively removed impacted soil to below COGCC allowable levels at the extent of the excavation. Soil vapor and indoor air sample results indicated that the groundwater saturated soil impacts remaining in place beneath the utility corridor were not impacting or a threat to the adjacent residence. Based on the remedial actions (i.e., source excavation), site assessment findings, and groundwater sample analytical results showing BTEX concentrations below the CGWQS for four consecutive quarterly monitoring events, Kerr-McGee is requesting NFA status for this site.

Feel free to contact me at 970-515-1161 if you have any questions regarding this information.

Sincerely,

Kerr-McGee Oil & Gas Onshore LP

Phil Hamlin
Senior HSE Representative

Attachments

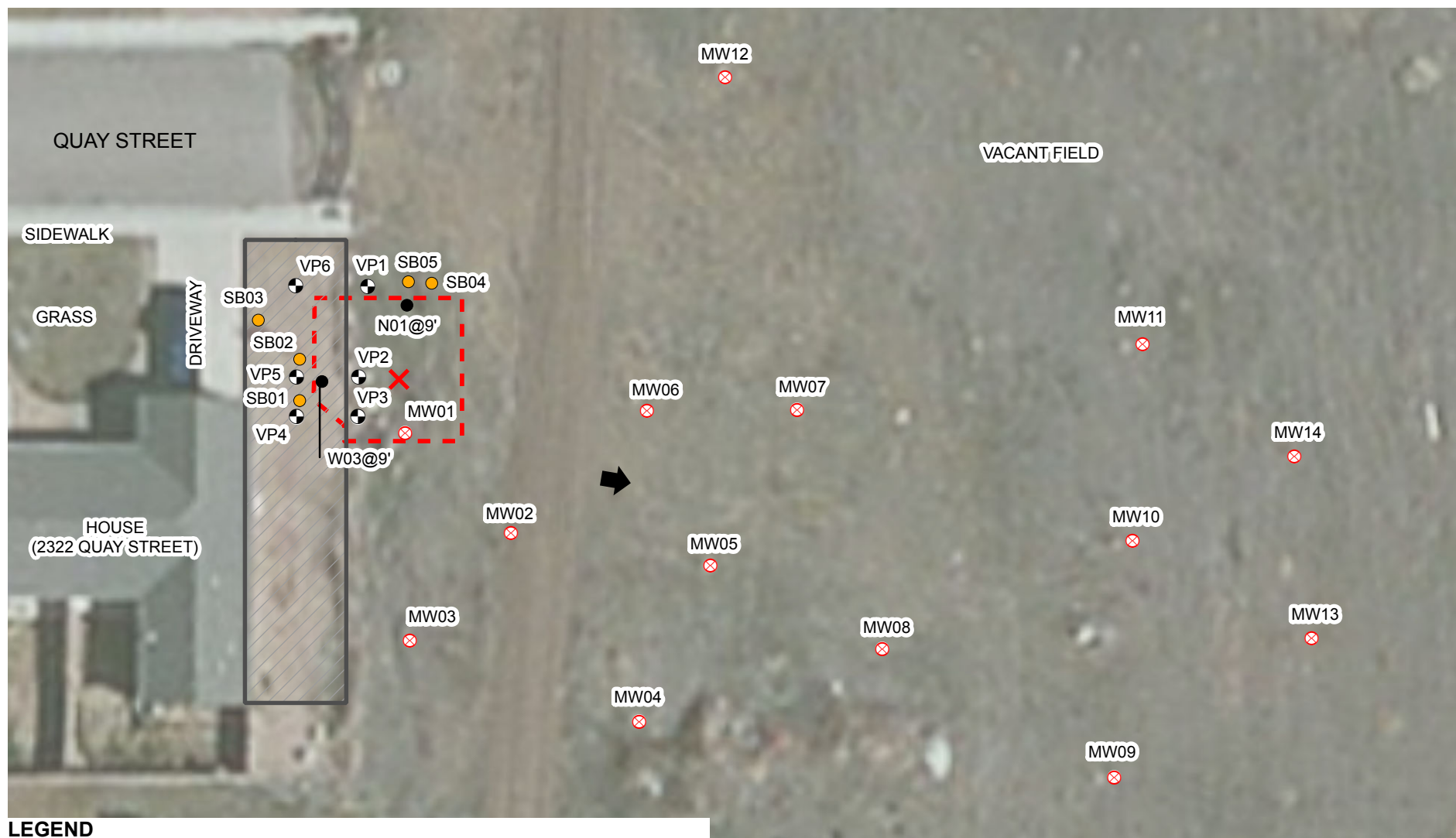


IMAGE COURTESY OF ESRI

LEGEND

- ✕ RELEASE
- ⊗ MONITORING WELL
- SOIL BORING
- EXCAVATION SOIL SAMPLE
- ⊗ SOIL VAPOR SAMPLING POINT
- ↑ SURVEYED GROUNDWATER FLOW DIRECTION
- EXCAVATION EXTENT
- UTILITY CORRIDOR

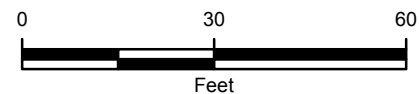


FIGURE 1
SITE MAP
WASS #5
NENE SEC 25-T5N-R66W
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP



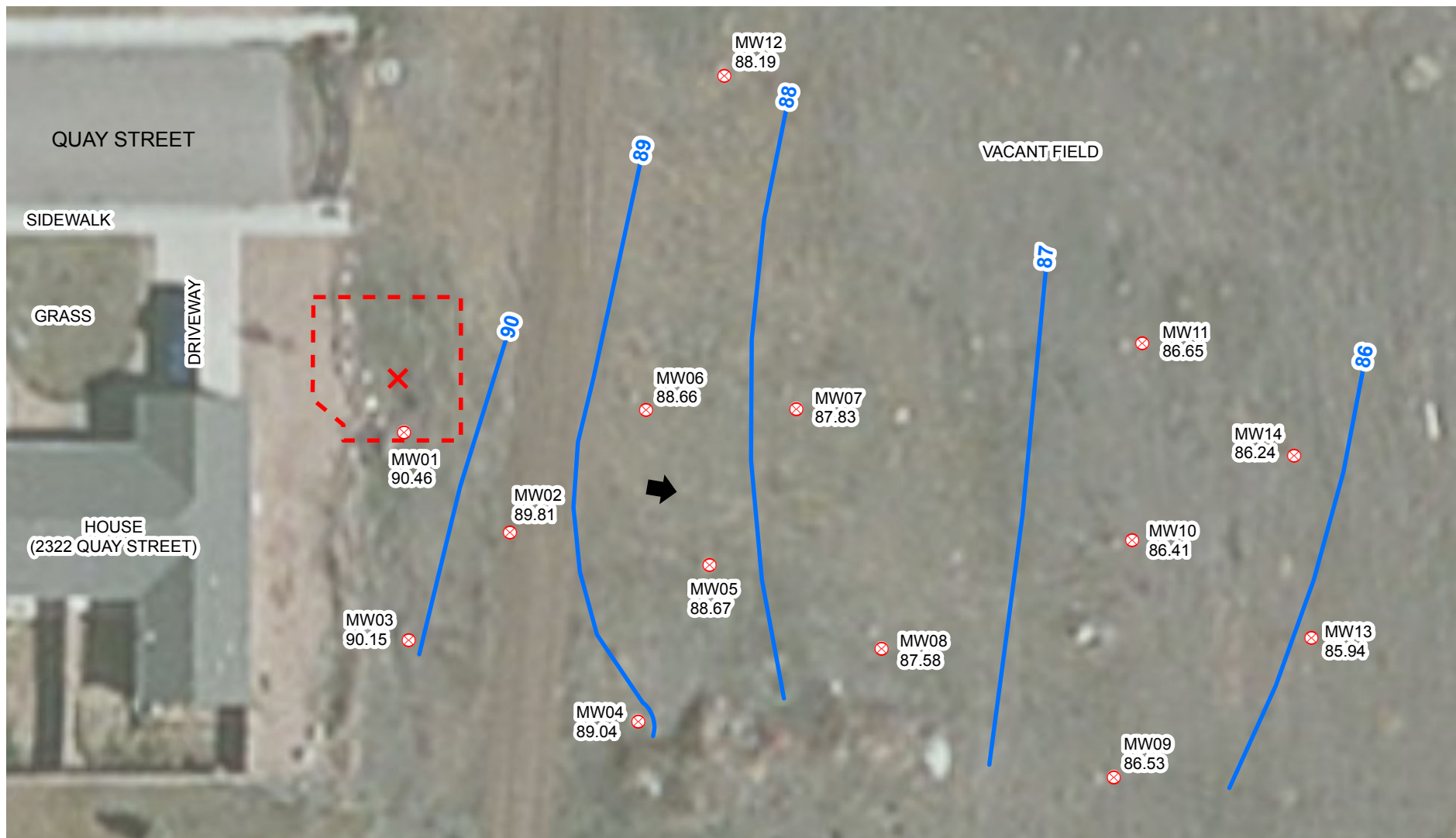


IMAGE COURTESY OF ESRI

LEGEND

✕ RELEASE

⊗ MONITORING WELL

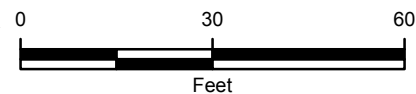
↑ SURVEYED GROUNDWATER FLOW DIRECTION

— RELATIVE GROUNDWATER ELEVATION CONTOUR

CONTOUR INTERVAL = 1 FOOT

GRADIENT = 0.026 FEET/FOOT

- - - EXCAVATION EXTENT



GROUNDWATER ELEVATIONS WERE
MEASURED ON OCTOBER 24, 2013.

FIGURE 2
GROUNDWATER ELEVATION CONTOUR MAP
WASS #5
NENE SEC 25-T5N-R66W
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP



TABLE
GROUNDWATER ANALYTICAL AND FIELD RESULTS
WASS #5
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Name	Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
MW01	04/21/2010	21	1.0	83	440	13.37	84.22
	07/02/2010	110	<1.0	<1.0	2.6	7.41	90.18
	10/08/2010	180	<1.0	130	110	8.69	88.90
	01/24/2011	420	<1.0	130	290	9.42	88.17
	04/25/2011	230	<1.0	190	370	9.89	87.70
	07/26/2011	75	<1.0	74	160	8.08	89.51
	10/20/2011	4.1	<1.0	3.6	3.4	7.57	90.02
	01/16/2012	5.8	<1.0	8.7	<1.0	8.69	88.90
	04/12/2012	2.7	<1.0	8.2	<1.0	9.36	88.23
	07/06/2012	1.5	<1.0	3.1	<1.0	9.24	88.35
	10/10/2012	4.4	<1.0	8.1	<1.0	8.84	88.75
	01/29/2013	1.7	<1.0	1.1	<1.0	8.69	88.90
	04/22/2013	2.2	<1.0	2.3	<1.0	9.08	88.51
	07/17/2013	<1.0	<1.0	<1.0	<1.0	8.39	89.20
	10/24/2013	Surveyed - Not Sampled				7.34	90.46
MW02	04/21/2010	54	1.0	140	480	8.90	88.17
	07/02/2010	6.6	<1.0	5.6	23	7.43	89.64
	10/08/2010	11	<1.0	5.3	8.7	8.45	88.62
	01/24/2011	4.2	<1.0	9.4	<1.0	9.32	87.75
	04/25/2011	1.1	<1.0	<1.0	<1.0	9.80	87.27
	07/26/2011	8.0	<1.0	3.3	<1.0	8.06	89.01
	10/20/2011	16	<1.0	18	3.9	7.94	89.13
	01/16/2012	7.9	<1.0	<1.0	<1.0	8.52	88.55
	04/12/2012	5.0	<1.0	1.1	<1.0	9.18	87.89
	07/06/2012	<1.0	<1.0	<1.0	<1.0	9.13	87.94
	10/10/2012	1.3	<1.0	<1.0	<1.0	8.40	88.67
	01/29/2013	<1.0	<1.0	<1.0	<1.0	8.26	88.81
	04/22/2013	<1.0	<1.0	<1.0	<1.0	9.01	88.04
	07/17/2013	1.1	<1.0	<1.0	<1.0	8.23	88.84
	10/24/2013	Surveyed - Not Sampled				7.53	89.81
MW03	04/21/2010	<1.0	<1.0	<1.0	4.0	14.16	83.33
	07/02/2010	<1.0	<1.0	<1.0	<1.0	7.38	90.11
	10/08/2010	<1.0	<1.0	<1.0	<1.0	8.17	89.32
	01/24/2011	<1.0	<1.0	<1.0	<1.0	9.39	88.10
	04/25/2011	<1.0	<1.0	<1.0	<1.0	10.00	87.49



TABLE (Continued)
GROUNDWATER ANALYTICAL AND FIELD RESULTS
WASS #5
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Name	Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
MW03	07/26/2011	<1.0	<1.0	<1.0	<1.0	7.93	89.56
	10/20/2011	<1.0	<1.0	<1.0	<1.0	7.75	89.74
	01/16/2012	<1.0	<1.0	<1.0	<1.0	8.61	88.88
	04/12/2012	<1.0	<1.0	<1.0	<1.0	9.36	88.13
	07/06/2012	<1.0	<1.0	<1.0	<1.0	9.30	88.19
	10/10/2012	<1.0	<1.0	<1.0	<1.0	7.98	89.51
	01/29/2013	<1.0	<1.0	<1.0	<1.0	7.83	89.66
	04/22/2013	<1.0	<1.0	<1.0	<1.0	9.33	88.16
	07/17/2013	<1.0	<1.0	<1.0	<1.0	7.98	89.51
	10/24/2013	Surveyed - Not Sampled				7.41	90.15
MW04	06/15/2010	<1.0	<1.0	<1.0	<1.0	NM	NA
	07/02/2010	<1.0	<1.0	<1.0	<1.0	7.79	88.83
	10/08/2010	<1.0	<1.0	<1.0	<1.0	8.77	87.85
	01/24/2011	<1.0	<1.0	<1.0	<1.0	9.47	87.15
	04/25/2011	<1.0	<1.0	<1.0	<1.0	10.04	86.58
	07/26/2011	<1.0	<1.0	<1.0	<1.0	8.58	88.04
	10/20/2011	<1.0	<1.0	<1.0	<1.0	8.54	88.08
	01/16/2012	<1.0	<1.0	<1.0	<1.0	8.69	87.93
	04/12/2012	<1.0	<1.0	<1.0	<1.0	9.78	86.84
	07/06/2012	<1.0	<1.0	<1.0	<1.0	9.73	86.89
	10/10/2012	<1.0	<1.0	<1.0	<1.0	8.74	87.88
	01/29/2013	<1.0	<1.0	<1.0	<1.0	8.62	88.00
	04/22/2013	<1.0	<1.0	<1.0	<1.0	9.20	87.42
	07/17/2013	<1.0	<1.0	<1.0	<1.0	9.04	87.58
	10/24/2013	Surveyed - Not Sampled				7.74	89.04
MW05	06/15/2010	110	<1.0	10	29	NM	NA
	07/02/2010	11	<1.0	1.6	3.6	8.28	88.61
	10/08/2010	47	<1.0	3.4	9.2	9.19	87.70
	01/24/2011	1800	<1.0	61	98	9.79	87.10
	04/25/2011	19	<1.0	1.1	2.7	10.29	86.60
	07/26/2011	230	<1.0	18	60	8.93	87.96
	10/20/2011	81	<1.0	5.3	7.6	9.13	87.76
	01/16/2012	60	<1.0	<1.0	<1.0	9.09	87.80
	04/12/2012	15	<1.0	7.0	9.4	9.93	86.96
	07/06/2012	<1.0	<1.0	<1.0	<1.0	9.83	87.06



TABLE (Continued)
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Well Name	Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
MW05	10/10/2012	2.9	<1.0	3.4	<1.0	9.00	87.89
	01/29/2013	3.0	<1.0	8.1	<1.0	8.48	88.41
	04/22/2013	<1.0	<1.0	<1.0	<1.0	9.78	87.11
	07/17/2013	<1.0	<1.0	<1.0	<1.0	9.43	87.46
	10/24/2013	Surveyed - Not Sampled				8.39	88.67
MW06	07/02/2010	2500	<1.0	250	670	8.38	88.94
	10/08/2010	3600	<1.0	300	1800	9.52	87.80
	01/24/2011	1600	<1.0	140	630	10.00	87.32
	04/25/2011	6.3	<1.0	1.5	6.6	10.32	87.00
	07/26/2011	1100	<1.0	69	250	8.93	88.39
	10/20/2011	1500	<1.0	51	3.3	9.01	88.31
	01/16/2012	520	<1.0	<1.0	<1.0	9.31	88.01
	04/12/2012	120	<1.0	<1.0	<1.0	9.89	87.43
	07/06/2012	31	<1.0	<1.0	<1.0	9.86	87.46
	10/10/2012	4.6	<1.0	45	<1.0	9.97	87.35
	01/29/2013	<1.0	<1.0	<1.0	<1.0	10.05	87.47
	04/22/2013	1.4	<1.0	15	<1.0	9.92	87.40
	07/17/2013	<1.0	<1.0	<1.0	<1.0	9.17	88.15
	10/24/2013	Surveyed - Not Sampled				8.89	88.66
MW07	07/02/2010	2900	<1.0	17	560	8.80	88.19
	10/08/2010	1800	<1.0	120	130	9.81	87.18
	01/24/2011	830	<1.0	120	78	10.17	86.82
	04/25/2011	240	<1.0	110	24	10.54	86.45
	07/26/2011	120	<1.0	120	4.8	9.35	87.64
	10/20/2011	110	<1.0	89	<1.0	9.62	87.37
	01/16/2012	1.7	<1.0	110	<1.0	9.67	87.32
	04/12/2012	1.9	<1.0	140	<1.0	10.24	86.75
	07/06/2012	2.0	<1.0	<1.0	<1.0	10.21	86.78
	10/10/2012	<1.0	<1.0	<1.0	<1.0	10.44	86.55
	01/29/2013	1.2	<1.0	<1.0	<1.0	10.31	86.68
	04/22/2013	1.5	<1.0	2.0	<1.0	10.17	86.82
	07/17/2013	<1.0	<1.0	<1.0	<1.0	9.51	87.48
	10/24/2013	Surveyed - Not Sampled				9.45	87.83
MW08	07/02/2010	950	<1.0	240	700	8.22	87.70
	10/08/2010	290	<1.0	130	100	9.32	86.60



TABLE (Continued)
GROUNDWATER ANALYTICAL AND FIELD RESULTS
WASS #5
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Well Name	Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
MW08	01/24/2011	50	<1.0	56	<1.0	9.73	86.19
	04/25/2011	2.2	<1.0	8.0	<1.0	10.14	85.78
	07/26/2011	9.8	<1.0	62	<1.0	9.00	86.92
	10/20/2011	1.1	<1.0	3.9	<1.0	9.40	86.52
	01/16/2012	<1.0	<1.0	14	<1.0	9.15	86.77
	04/12/2012	<1.0	<1.0	14	<1.0	9.64	86.28
	07/06/2012	<1.0	<1.0	4.3	<1.0	9.50	86.42
	10/10/2012	<1.0	<1.0	<1.0	<1.0	10.03	85.89
	01/29/2013	<1.0	<1.0	<1.0	<1.0	9.90	86.02
	04/22/2013	<1.0	<1.0	<1.0	<1.0	9.69	86.23
	07/17/2013	<1.0	<1.0	<1.0	<1.0	9.18	86.74
	10/24/2013	Surveyed - Not Sampled				8.56	87.58
MW09	08/23/2010	<1.0	<1.0	<1.0	<1.0	8.96	86.18
	10/08/2010	<1.0	<1.0	<1.0	<1.0	9.67	85.47
	01/24/2011	<1.0	<1.0	<1.0	<1.0	9.87	85.27
	04/25/2011	<1.0	<1.0	<1.0	<1.0	10.19	84.95
	07/26/2011	<1.0	<1.0	<1.0	<1.0	9.25	85.89
	10/20/2011	<1.0	<1.0	<1.0	<1.0	9.75	85.39
	01/16/2012	<1.0	<1.0	<1.0	<1.0	9.39	85.75
	04/12/2012	<1.0	<1.0	<1.0	<1.0	10.09	85.05
	07/06/2012	<1.0	<1.0	<1.0	<1.0	9.99	85.15
	10/10/2012	<1.0	<1.0	<1.0	<1.0	10.56	84.58
	01/29/2013	<1.0	<1.0	<1.0	<1.0	10.44	84.70
	04/22/2013	<1.0	<1.0	<1.0	<1.0	9.97	85.17
	07/17/2013	<1.0	<1.0	<1.0	<1.0	9.79	85.35
	10/24/2013	Surveyed - Not Sampled				9.07	86.53
MW10	08/23/2010	2.5	<1.0	3.2	12	9.59	86.14
	10/08/2010	110	<1.0	18	130	10.20	85.53
	01/24/2011	69	<1.0	6.8	43	10.39	85.34
	04/25/2011	28	<1.0	2.1	13	10.57	85.16
	07/26/2011	140	<1.0	66	260	9.64	86.09
	10/20/2011	31	<1.0	37	170	10.02	85.71
	01/16/2012	<1.0	<1.0	<1.0	<1.0	9.91	85.82
	04/12/2012	1.5	<1.0	<1.0	<1.0	10.47	85.26
	07/06/2012	1.9	<1.0	<1.0	<1.0	10.40	85.33



TABLE (Continued)
GROUNDWATER ANALYTICAL AND FIELD RESULTS
WASS #5
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Name	Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
MW10	10/10/2012	2.4	<1.0	<1.0	<1.0	11.12	84.61
	01/29/2013	<1.0	<1.0	<1.0	2.6	10.97	84.76
	04/22/2013	1.2	<1.0	<1.0	<1.0	10.41	85.32
	07/17/2013	<1.0	<1.0	<1.0	<1.0	9.97	85.76
	10/24/2013	Surveyed - Not Sampled				9.55	86.41
MW11	08/23/2010	<1.0	<1.0	<1.0	<1.0	9.86	86.39
	10/08/2010	<1.0	<1.0	<1.0	<1.0	10.45	85.80
	01/24/2011	11	<1.0	<1.0	<1.0	10.56	85.69
	04/25/2011	6.9	<1.0	<1.0	<1.0	10.72	85.53
	07/26/2011	<1.0	<1.0	<1.0	<1.0	9.83	86.42
	10/20/2011	<1.0	<1.0	<1.0	<1.0	10.12	86.13
	01/16/2012	<1.0	<1.0	<1.0	<1.0	10.06	86.19
	04/12/2012	<1.0	<1.0	<1.0	<1.0	10.53	85.72
	07/06/2012	<1.0	<1.0	<1.0	<1.0	10.42	85.83
	10/10/2012	<1.0	<1.0	<1.0	<1.0	11.31	84.94
	01/29/2013	<1.0	<1.0	<1.0	<1.0	11.14	85.11
	04/22/2013	<1.0	<1.0	<1.0	<1.0	10.54	85.71
	07/17/2013	<1.0	<1.0	<1.0	<1.0	9.96	86.29
	10/24/2013	Surveyed - Not Sampled				9.94	86.65
MW12	08/23/2010	<1.0	<1.0	<1.0	<1.0	13.78	84.35
	10/08/2010	<1.0	<1.0	<1.0	<1.0	10.34	87.79
	01/24/2011	<1.0	<1.0	<1.0	<1.0	10.88	87.25
	04/25/2011	<1.0	<1.0	<1.0	<1.0	11.13	87.00
	07/26/2011	<1.0	<1.0	<1.0	<1.0	9.76	88.37
	10/20/2011	<1.0	<1.0	<1.0	<1.0	9.72	88.41
	01/16/2012	<1.0	<1.0	<1.0	<1.0	10.38	87.75
	04/12/2012	<1.0	<1.0	<1.0	<1.0	10.95	87.18
	07/06/2012	<1.0	<1.0	<1.0	<1.0	10.91	87.22
	10/10/2012	<1.0	<1.0	<1.0	<1.0	10.90	87.23
	01/29/2013	<1.0	<1.0	<1.0	<1.0	10.75	87.38
	04/22/2013	<1.0	<1.0	<1.0	<1.0	10.81	87.32
	07/17/2013	<1.0	<1.0	<1.0	<1.0	10.35	87.78
	10/24/2013	Surveyed - Not Sampled				10.34	88.19
MW13	11/09/2010	49	<1.0	160	370	10.43	85.13
	01/24/2011	2.2	<1.0	19	9.9	10.63	84.93



TABLE (Continued)
GROUNDWATER ANALYTICAL AND FIELD RESULTS
WASS #5
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Name	Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Depth Water/ (Product Thickness) (ft bgs)	Relative GW Elev. (ft)
MW13	04/25/2011	<1.0	<1.0	10	<1.0	10.78	84.78
	07/26/2011	<1.0	<1.0	19	<1.0	9.94	85.62
	10/20/2011	<1.0	<1.0	7.1	<1.0	10.39	85.17
	01/16/2012	<1.0	<1.0	2.4	<1.0	10.17	85.39
	04/12/2012	<1.0	<1.0	1.0	<1.0	10.42	85.14
	07/06/2012	<1.0	<1.0	<1.0	<1.0	10.38	85.18
	10/10/2012	<1.0	<1.0	<1.0	<1.0	11.60	83.96
	01/29/2013	<1.0	<1.0	<1.0	<1.0	11.42	84.14
	04/22/2013	<1.0	<1.0	<1.0	<1.0	10.67	84.89
	07/17/2013	<1.0	<1.0	<1.0	<1.0	10.02	85.54
	10/24/2013	Surveyed - Not Sampled				9.70	85.94
MW14	11/09/2010	<1.0	<1.0	<1.0	<1.0	11.12	84.86
	01/24/2011	<1.0	<1.0	<1.0	<1.0	10.79	85.19
	04/25/2011	<1.0	<1.0	<1.0	<1.0	10.87	85.11
	07/26/2011	<1.0	<1.0	<1.0	<1.0	10.08	85.90
	10/20/2011	<1.0	<1.0	<1.0	<1.0	10.43	85.55
	01/16/2012	<1.0	<1.0	<1.0	<1.0	10.33	85.65
	04/12/2012	<1.0	<1.0	<1.0	<1.0	10.51	85.47
	07/06/2012	<1.0	<1.0	<1.0	<1.0	10.41	85.57
	10/10/2012	<1.0	<1.0	<1.0	<1.0	11.75	84.23
	01/29/2013	<1.0	<1.0	<1.0	<1.0	11.63	84.35
	04/22/2013	<1.0	<1.0	<1.0	<1.0	10.75	85.23
	07/17/2013	<1.0	<1.0	<1.0	<1.0	9.93	86.05
	10/24/2013	Surveyed - Not Sampled				9.84	86.24
Colo GW Quality Standards		5	1000	700	1400		

Notes: < - less than
ug/L - micrograms per Liter
NA - Not Analyzed/Not Available

GW - Groundwater Elev. - Elevation
Bold numbers indicate result equaled or exceeded standard.
NM - Not Measured ft bgs - feet below ground surface

